Essays on Child Labour and Schooling in Ghana

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Abstract

This thesis consists of three papers on child labour and schooling in Ghana. The first paper examines the correlates of child labour and schooling, as well as the trade-off between work and schooling of children aged 5-17 years with the 2013 Ghana Living Standard Survey data. A bivariate probit model is used since the decisions to participate in schooling and in the labour market are interdependent. The results show that there is a gender gap both in child work and schooling. In particular, boys are less likely to work (and more likely to be enrolled in schools) relative to girls. Whereas parent education, household wealth and income of the family are negatively correlated with child work, these factors influence schooling positively. In addition, parents' employment status, ownership of livestock, distance to school, child wage and schooling expenditure increase the probability of child labour and reduce the likelihood of school enrolment. In terms of the relationship between child labour and schooling, the results show that an additional hour of child labour is associated with 0.15 hour (9 minutes) reduction in daily hours of school attendance; and the effect is bigger for girls relative to boys. Also, one more hour of child labour is associated with an increase in the probability of a child falling behind in grade progression by 1.4 percentage points.

The second paper estimates the impact of Ghana's Livelihood Empowerment Against Poverty (LEAP) cash transfer programme on schooling outcomes (enrolment, attendance hours, repetition and test scores) and child labour in farming and non-farm enterprises. Using longitudinal data, the paper employs three different quasi-experimental methods (propensity score matching, difference-in-difference, and difference-in-difference combined with matching). Overall, the results show that the LEAP programme had no effect on school enrolment and test scores, but it increased the weekly hours of class attendance by 5.2 hours and reduced repetition rate by 11 percentage points for children in households that benefited from the programme. In addition, there was heterogeneity in these impacts, with boys benefiting more relative to girls. In terms of child labour, the results show that the programme had no effect on the extensive margin of child labour in farming and non-farm enterprises. However, the LEAP programme reduced the intensity of farm work done by children by as much as 2.6 hours per day. The largest impact of the programme, in terms of

reduction in the intensity of child labour in farming, occurred in female-headed and extremely poor households.

The last paper investigates the impact of mothers' autonomy or bargaining power in the household on their children's schooling and child labour in Ghana. The paper uses a non-economic measure of women's autonomy, which is an index constructed from five questions on power relations between men and women. The paper employs both an Ordinary Least Square (OLS) and an Instrumental Variable (IV) approach. Overall, the results suggest that ignoring the endogeneity of mothers' autonomy underestimates its true impact on schooling and child labour. They also show that an increase in mothers' autonomy increases school enrolment and hours of class attendance, with girls benefiting more than boys. The paper finds a negative relationship between mothers' autonomy and both the extensive and intensive margin of child labour. In addition, it demonstrates that improvement in women's autonomy has bigger impacts on rural children's welfare relative to urban children.

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Dedication

to

Emmanuel Ayifah (my husband), Fiifi N. Ayifah (my son) and Margaret Oduro (my mother)

Declaration

I declare that this thesis is my own work, except where acknowledged in the text. I further declare that this thesis has not been submitted for a degree at any other University.

Rebecca Nana Yaa Ayifah

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(Date)

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CHAPTER 1: General Introduction

1.1 Background

Human capital is an important driver of economic growth and development (Barro, 1991). The slow rate of economic development in Sub-Saharan Africa has partly been attributed to poor human development outcomes (Garcia and Moore, 2012). Investment in human capital development at an earlier age can have a significant effect on an individual's lifetime earnings capacity, which ultimately affects economic growth (Ferré and Sharif, 2014). Education is one of the ways through which an individual can improve upon his/her human capital. And in the case of children, parents consider the net present discounted value of the cost and future benefits of schooling in order to decide on the level of investment to make in their children's education. One of the main costs of education is foregone earnings from child work, since work and school are the two main contenders of children's non-leisure hours. This forgone income from work is an important cost of education; especially in countries where incomes are usually low. Hence there is high prevalence of child labour in most developing countries.

There are approximately 168 million child labourers aged 5-17 which represents 11 percent of children in the World (ILO, 2013). Sub-Saharan Africa (SSA) has the highest proportion of child labour with a participation rate of 21.4 percent. This implies that one in every five children in the sub-region is engaged in child labour. The sub-region also leads in the proportion of children engaged in hazardous works with 10.4 percent of its children in such activities (ILO, 2013). The large number of children in the labour market is troubling due to its adverse effect on total output which is estimated to be about 1- 2 percent loss of the annual Gross Domestic Product (Nielsen, 1998). This loss in Gross Domestic Product (GDP) results from the loss in human capital necessitated partially by the effect of child labour on school attendance (Khanam and Ross, 2011), test score performance (Heady, 2003; Bezerra et al., 2009) and high dropout (Cardoso and Verner, 2006). Also, work has a detrimental effect on the health of children because of their fragile anatomical, physiological and psychological characteristics (UNICEF, 1997).

Not only does SSA lead in the proportion of children in the labour market, but the sub-region also has the lowest school enrolment rates and other education outcomes. School enrolment rates in the sub-region have not increased much in relation to other regions and the world as a whole. For instance, adjusted primary school Net Enrolment Rate (NER) and completion rates in SSA were 77 percent and 67 percent respectively, while the world average rates were 90 percent and 88 percent correspondingly in 2009. Enrolment rates at secondary and tertiary levels of education are even lower with Gross Enrolment Rate (GER) of 43 percent in 2009 (after increasing from 28 percent in 1999) for lower secondary education in comparison to 72-80 percent for the rest of the world (UNESCO, 2011). The low school enrolment rates have partly been attributed to child labour (Khanam and Ross, 2011). Hence, this thesis examines child labour and schooling in a developing country, specifically Ghana.

Ghana provides an ideal environment for this study because it is one of the countries in Sub-Saharan Africa with the highest child labour participation rate (UNICEF, 2012). Although there is no consistent child labour survey in the country, the 1999 Ghana Living Standard Survey (GLSS 4) report indicated that the total number of children engaged in the labour market was 1.4 million and this amounted to 27.8 percent of children in the country (GSS, 2000). In 2001, a comprehensive research on children's involvement in the labour market was undertaken under the Ghana Child Labour Survey (GCLS) (GSS, 2003). This survey showed that out of about 6.4 million children aged 5-17 years in the country, about 2 million of them were working and out of this about 1.2 million were child labourers. The report also revealed that out of the number of child labourers, about 1 million (1,031,220) of them were below the age of 13 years. These findings by the GCLS report (2003) led to the incorporation of elimination of child labour into the country's development plans including the Ghana Poverty Reduction Strategy (GPRS I) and the Growth and Poverty Reduction Strategy (GPRS II). Again, the country ratified the ILO Convention on the Minimum Age (Convention 182) in 2011 and enacted the Human Trafficking Act (Act 720) in 2005. Despite these interventions, child labour participation rate is still on the ascendency with the 2014 Ghana Living Standard Survey report showing that 21.8 percent of children (1,892,553) in the country are child labourers. Also, Ghana was listed as one of the countries that use child labour in cocoa production and gold mining by the US Department of Labour in 2014[1].

[1] According to the Sixth Trafficking Victims Protection Reauthorization report of USA's Department of Labour List of Goods of Produced by Child Labour or Forced Labour.

In addition, improvements in educational outcomes in Ghana have not been impressive, with the exception of enrolment rates particularly at the primary level which has a Gross Enrolment Rates of 95 percent and 128.3 percent in 2007/2008 and 2014/2015 academic year respectively (Ministry of Education, 2016). Even with such improvement, one million children aged 6-14 years were out of school in 2008 (Ghana Statistical Service et al, 2009). Again, repetition rates for public primary schools were 6.5 percent, 6.6 percent and 8.5 percent in 2003/2004, 2004/2005 and 2005/2006 academic years respectively (Ministry of Education, Science and Sports, 2006).

Participation of children in the labour market and low educational outcomes in Ghana are relatively higher among the poor (Grootaert and Coulombe, 1998; Nielsen, 1998; Akyeampong et al., 2007). To bridge the income gap and lift people out of poverty, the country has formulated the National Social Protection Strategy (NSPS). One of the most important programmes being implemented under the NSPS is the Livelihood Empowerment Against Poverty (LEAP) scheme. The LEAP is a cash transfer scheme introduced in 2008 to alleviate short-term poverty and build the human capital of poor household members. The LEAP programme is targeted at households that besides falling into the extreme poverty definition also have a member who falls into one of these three main demographic characteristics: a single parent with orphans and vulnerable child (OVC); poor elderly person (over 65 years) or someone with extreme disability who cannot work. The programme provides poor households with periodic cash transfer conditioned on school enrolment and retention; as well as non-participation of children in the labour market among other behavioural changes.

The transfer of cash to poor households has several implications on households' decision making including children's participation in the labour market and schooling as well as schooling outcomes. Cash transfers can enable poor households who could not afford schooling initially to now send their children to school, thereby increasing school participation. Again, the cash could enable poor households that were depending on the income from child labour to withdraw their children from the labour market; and this may also reduce child labour. Furthermore, the cash may enable households to purchase educational materials and nutritious food, as well as, provide for the health needs of their children. All these will improve upon children's schooling outcomes such as repetition rate and test score. However, this cash could also enable poor households that were unemployed

to now engage in businesses that will require the uses of child labourers and hence increase child labour; and this may reduce school attendance and test scores. Hence, the effects of cash transfer on work and school participation as well as schooling outcomes are not straight forward and remain an empirical question (De Hoop and Rosati, 2013).

The transfer of cash and development of the income generation capacities of poor households are important measures for improving education and eliminating child labour. However, the empowerment of women is equally important, especially in patriarchal societies like in most Sub-Saharan African (SSA) countries where there is male dominance. This is so because the allocation of the household's resources among various goods, particularly on children's products, depends on who is the main decision maker. Literature suggests that children benefit more when resources are in the hands of women relative to men (Hoddinott and Haddad, 1995; Quisumbing, 2003; Al Riyami et al., 2004; Woldemicael, 2010; Allendorf, 2012; Ebot, 2014). Women's autonomy or bargaining power in decision making is very important for child labour and schooling decisions (Reggio, 2011; Ambreen, 22013). Women tend to have less autonomy or decision making power in most SSA countries, including Ghana. This is so because the majority of women live in rural areas where they have less access to work outside the household and are constrained by norms and customs that assign different roles to men and women. Also, in Ghana, couples do not always pool their resources together and joint decision makings between couples are usually rare (Baden et al., 1994). Hence, this thesis further examines women's autonomy or bargaining power in Ghana and how this affects child labour and schooling.

1.2 Objectives of the Thesis

Based on the above analysis, this thesis examines the determinants of children's participation in work and/or school; and the effect of cash transfer programme and mothers' autonomy in the household on human capital development in Ghana. Specifically, the study seeks to:

1. Identify the main correlates of child labour supply and schooling; as well as the effect of work on schooling.
2. Estimate the impacts of the LEAP cash transfer programme on child labour supply and schooling outcomes (enrolment, class attendance, repetition and test scores).

3. Examines the effects of mothers' autonomy or bargaining power on child labour supply and schooling.

1.3 Child Labour and Schooling in Ghana

1.3.1 Definition of Child Labour

In most African countries and, in particular Ghana, the engagement of children in certain works is considered a form of training or socialization. In recognition of this, Ghana's Children Act (1998) allows the employment of children age 13 years and above in "light works" which are not harmful to their health and education. However, the Act prohibits child labour which it defines as "the engagement of a child in exploitative labour, which deprives the child of his/her health, education and development". The minimum employment age for a child is 15 years[2] but such works must not be "hazardous". A work is considered hazardous when it poses danger to the health, safety or morals of a person and it includes:

1. Going to sea
2. Works in mining and quarrying sectors
3. Porterage of heavy loads
4. Works in manufacturing industries where chemicals are produced or used
5. Works in places where machines are used
6. Works in places such as bars, hotels and places of entertainment where a person may be exposed to immoral behaviour.

The minimum age for employment of a child in hazardous works is 18 years since children are persons below the age of 18 years. In addition to the above, the Act prohibits employment of children in night works that take place between 8pm to 6am. These definitions imply that the involvement of children less than 13 years in any economic activities is considered child labour. For children between ages 13-17 years, their involvement in economic activities can be defined as child labour only if that work is harmful to their health, schooling and development, or the work is hazardous in nature based on the definition of hazardous work stated above. Apart from the Children's Act, the Ghana's Labour Act (2003) also makes

[2] This is in accordance with the ILO Minimum Age Convention which Ghana ratified in 2011.

employment of children illegal. Though these two Acts seek to protect children, there seem to be a gap between the legal intent and practice as enforcement of these laws is rare (Manful and McCrystal, 2011). In addition, the definition of "light works" is too vague (Canagarajah and Coulombe, 1998). These definitions are used in the thesis, unless otherwise stated[3].

1.3.2 Extent and Nature of Child Labour in Ghana

Ghana, like other developing economies, has been battling with the problem of child labour. To eliminate the child labour menace, the government has initiated a number of initiatives both legislative and policy wise. The country was among the first countries to ratify the UN Convention on 'The Rights of the Child' and followed it up by developing a national policy framework dubbed 'The Child Cannot Wait' in 1992. This provided a national strategy for protecting children. The National Action Plan, which is a multi-sector approach coordinated by the Child Labour unit of the Ministry of Gender, Children and Social Protection, was validated in 2009. Also, in response to the high international concern on the use of child labourers in cocoa farming, the country instituted the National Programme for the Elimination of Worst Form of Child Labour in Cocoa (NPECLC) and the Hazardous Child Labour Framework, all with the long term aim of eliminating child labour in Ghana. In terms of legislation, the government has enacted the 'The Children Act' (1998) to protect children's rights and the Labour Laws (2003) with clauses that prohibit child labour.

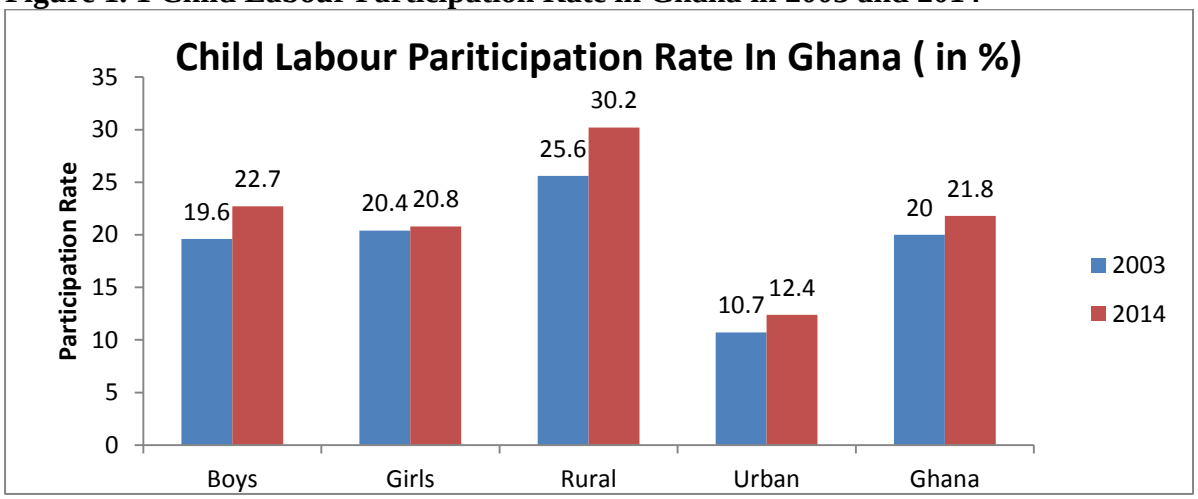
Despite these interventions, the incidence of child labour is still high in the country as stated earlier. There is no consistent child labour survey in the country, however, various versions of the Ghana Living Standard Surveys (GLSSs) have been reporting on children's (7-14 years) engagement in the labour market. For instance, the 1988 GLSS stated that about 7 percent of the country's labour force is made up of persons below 15 years. This increased slightly to 7.8 percent in 1995 (GLSS 3). However, it was the fourth round of the GLSS (GLSS 4) that brought into light the issue of working children. The GLSS 4 estimated that about 1.47 million children aged 7-14 years were engaged in economic activity with a participation rate of 27.8 percent. In addition, it showed that 30.3 percent and 25.5 percent of

[3] The definition of child labour used in the thesis excludes children's involvement in household chores. Also, there is no universal definition for child labour and according to the ILO the definition of child labour should be dependent on the age of the child, nature of work, conditions of work and hours of work, hence a "working definition" for child labour is provided for each chapter.

girls and boys in the country were engaged in economic activity[4] respectively. In terms of location, 26 percent and 28.2 percent of urban and rural children respectively were engaged in some form of economic activity.

The most comprehensive survey on children's involvement in the labour market is the Ghana Child Labour Survey (2003), which estimated that about two million[5] children aged 5-17 years in the country were engaged in economic activity with participation rate of 31.3 percent. The survey distinguished between children's engagement in economic activities, child labour and hazardous works based on the above definitions. Since children as young as five years have been found in the labour market (Canagarajah and Coulombe, 1998), this survey reduced the starting age of children in the labour market to five contrary to previous surveys that considered children from seven years[6]. Though the GLSS continues to report children's engagement in the labour market, the next child labour survey was only carried out in 2012/13 as part of the sixth GLSS. Figure 1.1 shows child labour participation in 2003 and 2014.

Figure 1. 1 Child Labour Participation Rate in Ghana in 2003 and 2014[7]



Source: 2003 Child Labour Report and GLSS 6 Child Labour Report (2014)

[4] Any activity that yields either cash or in-kind benefits to the child or his/her household. This is a broader definition of child labour. It excludes household chores but includes child labour and hazardous works.

[5] This is based on children activity in the last 7 days; using the last 12 months prior to the survey the participation rate was 40 percent with about 2.5 million children engaged in economic activities in 2003.

[6] The starting and ending ages of children in the labour market may have accounted for the difference between the Ghana Living Standard Surveys estimates and the estimates from the Child Labour Surveys. However, most of the analysis on the extent of child labour in Ghana is based on the 2001 Child Labour Survey and 2012/13 GLSS 6 Child Labour Survey and both surveys considered children aged 5-17 years.

[7] The first child labour and GLSS 6 child labour surveys were carried out in 2001 and 2012/13 respectively but the reports came out in 2003 and 2014 respectively.

From figure 1.1, it is clear that there has been a slight increase in child labour participation rate from 2003 to 2014 among all groups despite the various interventions implemented to curb it. As, at 2014, 21.8 percent of children, which amount to 1,892,553 children in the country, were child labourers; while, in 2003, there were 1,273,294 child labourers (20 percent of children in Ghana). For both periods, the proportion of rural children engaged in child labour was higher than those from urban centres. In addition, while girls' labour market participation rate increased from 20.4 percent in 2003 to only 20.8 percent in 2014 that of boys increased from 19.6 percent to 22.7 percent. In addition, though child labour participation rate among girls was higher than that of boys in 2003, this reversed in 2014. Moreover, out of the number of child labourers recorded in 2014, more than half of these children (14.2 percent of children in Ghana), which amount to 1,231,286 children, were engaged in hazardous works. This represents a huge increase from the 2003 figure of 501, 601 children in hazardous works.

Furthermore, the sixth GLSS report indicated that majority of child labourers in Ghana were engaged in unpaid family works (93.7 percent), followed by own account workers (2.7 percent), unpaid apprentices (1.5 percent), paid workers (1.1 percent), causal/domestic workers (0.8 percent) and other workers (0.2 percent). In terms of industry, 77.2 percent of child labourers were engaged in agriculture related activities, 12.4 percent were found in wholesaling and retailing; only 3.8 percent in the manufacturing sector and the remaining 6.6 percent found in other industries including mining and quarrying, construction and transportation among others (GSS, 2014b). Also, as depicted in table 1.1, children involvement in work increased as their ages increased.

Table 1. 1 Involvement of Children in Various Works by Age Groups (in %) in 2014

	Economic Activities	Child Labour	Hazardous Works
All	28.5	21.8	14.2
5-7 years	10	10	4.5
8-11 years	25.6	25.6	12
12-14 years	38.3	26.9	18.8
15-17 years	43.7	23.9	23.9

Source: GLSS 6

1.3.3 Education in Ghana

Ghana's educational system has gone through various reforms with the most significant one that brought in the current education and training system being the 1986/87 Education Reforms Programme. This reduced the duration of the education system from the 6-4-5-2-3/4 to the 6-3-3-4; that is pre-tertiary schooling reduced from 17 years to 12 years (Palmer, 2005). However, under the former system the number of years that a person spends at the pre-tertiary level is dependent on his/her ability as some students proceeded to secondary school after six years at the primary level while other spent between one to four years at the middle school before proceeding to secondary school. Currently, basic education consists of six years of primary and three years of junior high school; while post-basic education comprises of three years of senior high/technical/vocational school and four years of tertiary education. Though the duration of senior high school was changed from three years to four years in 2007, it was reverted back to three years in 2013. In addition to these, there is pre-school education, which consist of crèches (between the ages of 3 and 4) and nursery schools (between the ages of 4 and 6) with the national primary school entry age being six years.

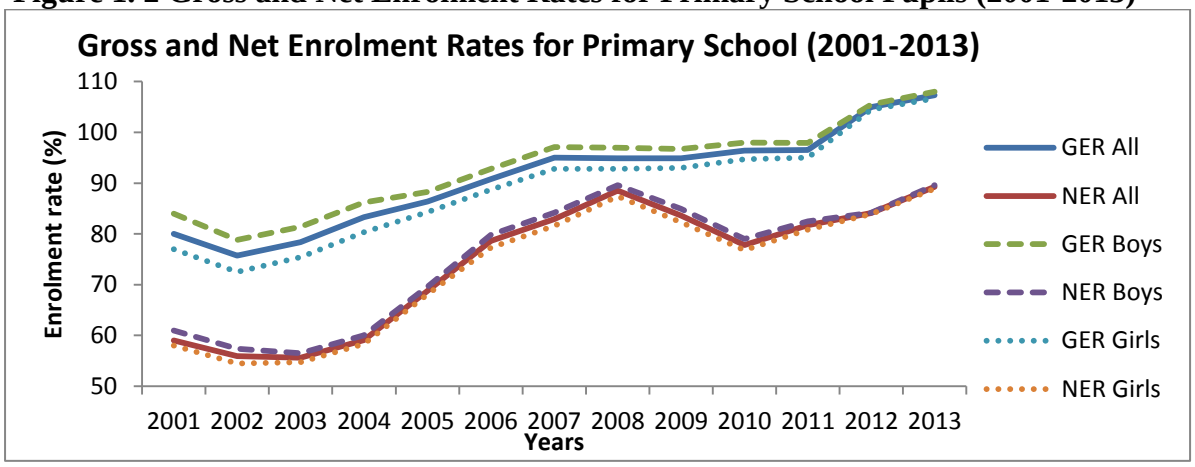
Other significant policy strategy in the education system is the adoption of the Free Compulsory Universal Basic Education (FCUBE) in 1995 that aimed to ensure universal primary education by 2005; however, this was not achieved (Akyeampong, 2009). The FCUBE initially covered mandatory schooling of all children to the primary level, but it was extended to include the Junior High level (i.e. from 6 years to 9 years of mandatory school), and it was further increased to include two years of pre-primary school; thereby making the mandatory schooling years eleven (UNICEF, 2012). Interventions introduced to facilitate the achievement of the goal of the FCUBE are the capitation grant, school feeding programme, early childhood education, free exercise books and uniform among others. The capitation grant piloted in 2005 abolished the payment of school levies at pre-school and basic level of education in public schools. Under this system, every public kindergarten, primary and junior secondary schools receives a grant of about three Ghana cedis (GH¢) per pupil per year in 2005, but this was increased to GH¢4.50 per head in 2009.

The school feeding programme was also launched in 2005. This involves the provision of one nutritious meal to primary school children in public school. The free exercise books and uniforms interventions were started in 2010 and they involve the distribution of these items to

needy children in deprived areas. In spite of these initiatives, there are still schools that do not have access to textbooks and other teaching materials, particularly rural schools (UNDP, 2014). In other words, though the majority of children have exercise books, most of them do not have textbooks (Ministry of Education, 2014).

These interventions have resulted in increases in school enrolment, especially at the basic level. For instance, Net Enrolment Rates (NER) at the primary level increased from 68.8 percent in 2005/06; to 78.6 percent in 2006/07 and to 88.5 percent in 2008/09 and remained at that level in 2009/10, but increased to 89.3 percent in 2013/14, as shown in the figure 1.2 (Ministry of Education, 2015). From figure 1.2, NERs are usually lower than Gross Enrolment Rates (GERs) after adjusting for the ages of pupils. This may be due to late enrolment, high dropout rates and high repetition rates among other factors. Also, for all years, boys have higher GERs and NERs relative to girls. This gender gap, however, seems to narrow at higher levels of education as the NER at the Senior High School (SHS) was 21.7 percent for boys and 21.8 percent for girls in 2013/14 (Ministry of Education, 2015).

Figure 1. 2 Gross and Net Enrolment Rates for Primary School Pupils (2001-2013)



Source: Ministry of Education, 2015

Again, the country has made some progress in respect of children (5-17 years) who have never been to school, but there are still variations in this rate geographically. The proportion of children who have never been to school was 17.6 percent in 2003 and this was higher in rural areas where 24.5 percent of children had never been to school relative to 6.2 percent in urban area (GSS, 2003). This has reduced, as only 5.9 percent of children aged 5-17 years had no education, with urban and rural areas having 2.2 percent and 9.2 percent respectively

in 2014. In terms of gender, while 6.1 percent of girls have never been to school, only 5.7 percent of boys have never been to school as of 2014. Reasons for not attending school are numerous with the main reason relating to schooling costs and facilities (i.e. no school in community, high school cost and school too far) followed by the need to work in either family enterprises or work outside for pay or engage in household chores (GSS, 2014b).

1.4 Structure of the Thesis

The thesis is a collection of three papers on child labour and schooling in Ghana. These three papers will form the main chapters of this thesis. The first chapter covers the introductory part which is presented above.

The second chapter uses Ghana's Living Standard Survey (2013) data to examine the main factors associated with child labour (extensive and intensive margin of child labour) and schooling (enrolment and hours of class attendance) of children aged 5-17 years.

The third chapter of this thesis examines the impacts of the LEAP programme on child labour and schooling outcomes. High poverty rates have been linked with high child labour force participation rate and low schooling in developing countries. Most developing countries are implementing various social protection policies, including cash transfer schemes, as a way of alleviating poverty and developing the human capital of beneficiaries. In spite of the rapid expansion of cash transfer programmes in SSA, there is limited research on the impacts of these programmes. This chapter helps to fill in this gap in the empirical literature by using longitudinal data collected in 2010 and 2012 on Ghana's Livelihood Empowerment Against Poverty (LEAP) programme to estimate the impact of this scheme on child labour and educational outcomes (enrolment, class attendance, repetition and test scores). Since the data is observational in nature, the chapter uses three quasi-experimental evaluation techniques – Propensity Score Matching (PSM), Difference-in-Difference (DD) Matching combined with Difference-in-Difference (MDD).

The fourth chapter of thesis examines the effect of mothers' bargaining power or autonomy on child labour and schooling in Ghana. Women's autonomy in the households is one of the most significant factors that influence children's schooling and child labour decisions, especially in Sub-Saharan Africa (SSA) countries. However, women tend to have lower

decision making power or autonomy relative to men in most developing countries, including Ghana, due the patriarchal nature of these societies. This chapter uses a nationally representative survey conducted in 2010 in Ghana. It uses an Instrumental Variable (IV) estimation strategy to account for the possibility of endogeneity of mothers' bargaining power.

The thesis ends with chapter five which summarizes the main findings of the previous chapters. This final chapter also addresses some limitations of the thesis and provides areas for further research.

CHAPTER 2: Child Labour and Schooling in Ghana: Correlates and Trade-Off

2.1 Introduction

Ghana has made some progress in poverty reduction with the national poverty rate falling from 39.5 percent in 1998/99 to 24.2 percent in 2012/13 (GSS, 2014c). At the same time, the country has introduced the Free Compulsory Universal Basic Education (FCUBE), the capitation grants and school feeding programme among other interventions in education. In spite of these policies, child labour is relatively high and some children are still out of school. The first child labour survey conducted in 2001 estimated that the proportion children (5-17 years) engaged in child labour was about 20 percent (GSS, 2003). This increased to 21.8 percent in 2014 (GSS, 2014b). This raises the questions of what factors influence households' decision to send their children to work and/or school. Also, among children who are already working, what determines the number of hours of work they do and what is the effect of these works on education?

This chapter provides answers to these questions by establishing the main correlates of child labour participation and school enrolment using the bivariate probit model. This is because these decisions are interdependent. Also, the chapter examines the factors that affect the intensive margin of child labour (hours of work); and the effect of work on education. Specifically, it investigates the main correlates of children's (5-17 years) participation in child labour and schooling; as well as their participation in hazardous works. Furthermore, it examines the effect of work intensity on hours of class attendance and educational attainment. As noted by Orazem and Gunnarsson (2004), it is important to adjust for age when considering the educational attainment of children; hence, the chapter uses the so called School- for-Age (SAGE) as a measure of educational attainment.

Universally, there is an agreement on the need to eliminate child labour and improve schooling enrolment; however, there is no consensus on the right way to tackle these (Ray, 2000). With respect to child labour, the main policy instrument has been the enactment of laws prohibiting it and the banning or labelling of products made using child labour (Basu and Van, 1998). However, over the years, the effectiveness of these policies has been

questioned. There is little evidence on the effectiveness of banning policies and these are limited to developed countries (Piza and Souza, 2016). Banning of child labour may move children into the informal sector where conditions of work are worst relative to the formal sector; and it may even increase child labour, as was found in India (Bharadwaj et al., 2013). The ineffectiveness of banning policies may stem partly from the fact the children's participation in work and school is affected by multiple factors and these factors differ by countries. Therefore, determination of factors affecting the joint decisions of work and/or school is necessary for formulation of policies to eliminate child labour and improve upon schooling.

Though there are numerous studies (Patrinos and Psacharopoulos, 1997; Canagarajah and Coulombe, 1998) on child labour, most of these are concentrated on factors affecting the participation decision of the child (extensive margin of child labour). They ignore the factors that affect the total number of hours of labour (intensive margin of child labour) supplied by children. This chapter tries to fill in this gap in the literature by examining both the extensive margin and intensive margin of child labour. Also, it improves upon previous studies by including schooling and community variables, such as child wage, distance to nearest school and schooling expenditure, which are important in explaining work and school decisions. Hazardous work is the worst form of child labour; hence, it is more dangerous to children's development. However, this type of work has received less attention relative to 'normal' child labour in the literature (ILO, 2011). This chapter extends the literature on child work by examining children's participation in hazardous works as well as the intensity of such works.

The chapter uses data from the sixth round of the Ghana Living Standard Survey (GLSS 6). This survey was conducted in 2012/2013 by the Ghana Statistical Service and it contains information on children's involvement in various activities including schooling, child labour, and hazardous works among others. In addition, this survey has information on the characteristics of children, as well as their parents and households characteristics. Hence, this dataset is ideal for analysis on child work and schooling. The decisions to send a child to work and to school are interdependent since these two child activities compete for the non-leisure hours of children. Therefore, this chapter uses a bivariate probit model to simultaneously estimate the correlates of child work and schooling.

The results show that for both hazardous and non-hazardous work, parent education, household wealth and income of the family have a negative and a positive association with child labour and schooling respectively. Also, a child's likelihood of working increases while his/her probability of schooling falls when his/her parents is employed. In addition, household ownership of livestock, distance to nearest school, child wage and schooling expenditure have a positive and a negative effect on child labour and school enrolment respectively. Furthermore, child labourers work for fewer hours when they are enrolled in school. Also, ownership of land, receipt of remittance, increase in household income and wealth, as well as low school expenditure all leads to a reduction in the hours of child labour. Finally, the chapter finds that an additional hour of child labour is associated with 0.15 hour (9 minutes) reduction in hours of class attendance; and the effect is bigger for girls. Also, one more hour of child labour increases the probability of a child falling behind in grade progression by 1.4 percentage points.

The rest of this chapter is as follows. The next section (section two) reviews relevant literature on factors affecting child labour and schooling (enrolment and hours of attendance) as well as the effects of work on children's educational attainment. This is then followed by the methodology which looks at the data and estimation technique employed in this chapter in section three. Analysis of child labour and schooling situation in Ghana is in section four. Discussion of the results follows in section five with section six concluding this chapter.

2.2 Review of Relevant Literature

Analysis of child labour was initially viewed as lack of access to schooling (Blunch and Verner, 2000). Hence, initial studies, including Chao and Alper (1998), viewed child labour as a factor affecting schooling decision and included it as an explanatory variable in the estimation of the factors affecting schooling. Later, the literature moved to integrate the work decision, and thus analyse schooling and child labour decisions jointly or separately. Studies (Patrino and Psacharpoulous, 1997; Ray, 2000; Ravallion and Wooden, 2000; Phoumin and Fukui, 2006) that examine these two decisions separately usually use the probit or logit models to estimate the main determinants affecting them. However, to account for the interdependence between work and school decisions, other studies (Cartwright and Patrino, 1999; Haile and Haile, 2012; Yared and Gurmu, 2015) have employed the bivariate probit,

the sequential and multinomial logit/probit models to study these. This chapter follows this latter approach since there is the likelihood that these two decisions are interdependent.

In terms of the factors influencing child labour and schooling decisions, reviews of the empirical literature show that these decisions are affected by poverty, educational facilities, parental education and employment, as well as the child, household and community characteristics (Brown et al., 2002; Fors, 2012; Webbink et al., 2011). Theoretically, poverty can adversely affect child labour through several channels. As noted by Fors (2012), the effect of poverty on child labour and schooling can be analysed from two sources, namely subsistence and lack of opportunity. Poor households may depend on the income or benefits from child work. Hence, they may send their children to the labour market, but remove them from the labour market once their income levels improve. Thus, child labour is a response to extreme poverty. This idea forms the basis of the multiple equilibria model by Basu and Van (1998) which was tested by Bhalotra (2007). Households may not be poor in terms of income, but they may lack opportunities in the form of low return on investment in schooling which may result in lower wages (Fors, 2012). Consequently, they may resort to child labour.

Empirical studies on child labour and poverty have reported mixed results. This has been attributed to several factors, including the measurement of poverty. Empirically, different measurements of poverty have been used (Ilahi, 2001). Expenditure per capita of the household as a proxy for welfare was used by Canagarajah and Coulombe (1998) in their study of child labour and schooling in Ghana; they found an inverted U-shaped relationship. However, Blunch and Verner (2000) used households' access to basic items. This study measures poverty with expenditure per capita and wealth index which shows the household's ownership of forty durable assets, including television, fridge, radio etc. These help to establish the effect of both current income and households' accumulated wealth on child labour and schooling of children.

Poverty of opportunity includes schooling-related factors such as poor school quality, absence of schools and higher schooling costs. These supply-side variables have been found to affect both child labour and schooling in Africa (Bonnet, 1993; Ray, 2003; Leclercq, 2002). Parents may not send their children to school because of the poor quality of school. Measurement of school quality is usually difficult and empirical studies use proxies such as the cost of schooling (Lavy, 1996), building characteristics, writing materials (e.g., chalk,

notebooks, pencils, etc.), availability of textbooks, graded classrooms (Angrist and Krueger, 1991) and distance to the nearest primary school. While distance to the nearest school has been found to affect schooling, it had no effect on child labour (Kondylis and Manacorda, 2006). Other studies (Lavy 1996; Jensen and Nielsen, 1997) find that transportation costs of schooling are important for child labour and school participations. Gertler and Glewwe (1990) refine this conclusion by investigating the willingness to pay for reducing the distance to school and find that both rich and poor households are willing to pay a price for reduction in the distance to schools to less than one kilometre.

In addition to these factors, other child, parent, household and community characteristics have been identified in the literature to affect parents' decisions to send their children to work and/or school. Available studies show that a child's age (Brown, 2006; Okpukpara and Odurukwe, 2006; Mwebaze, 2004) has a positive influence on whether he/she will attend school or engage in child labour. Thus, as children grow and acquire more skills, they are used for productive activities in either the household or outside the household. Also, older children with younger siblings also tend to care for them and engage in child labour. In addition, when the definition of child labour is extended to include their involvement in household chores, then girls have higher probability of working relative to boys (Blunch and Verner, 2000). This gender gap is also found in schooling as boys are more likely to attend school in comparison to girls (Nielsen, 1998; Canagarajah and Coulombe, 1998).

Furthermore, two important parent characteristics found in the literature that affect child labour and schooling are parents' education and employment status (Basu and Ray, 2002). Parents who are more educated tend to send their children to school (Lavy, 1996) instead of sending them to the labour market. Less educated parents are more likely to send their children to the market regardless of income, as they do not weigh the costs and benefits of child labour (Rimmer, 1992; Psacharopoulos, 1997; Brown, 2006). Separating the educational level of parent into that of the father and mother enables proper assessment of which parent's education is important. For instance, while Emerson and Souza (2007) find fathers' education to be important in child labour reduction; Kurosaki (2006) finds that it is the mother's education that matters for child labour reduction.

Again, in most developing countries, children grow up to do jobs similar to that of their parents, hence parental employment status has a strong effect on children's working status

and/or schooling. Also, most parents in developing countries view child labour as a form of training for their children, especially in occupations that require less formal education (Bass 2004; Lieten, 2002; Beegle et al., 2004). However, there are two main arguments regarding the relationship between parents' employment and child labour. There is the complementary argument which says that when mothers engage in jobs outside the households, children take up works in the house, especially when there are younger children in the household (Levison, 1991; Patrinos and Psacharopoulos, 1995). Also, children, especially girls, tend to work when their mothers are working as they follow their mothers to work (Francavilla and Gianelli 2007; Bhalotra, 2003). The substitution argument, on the other hand, views parents and children as substitutes in the work place (Basu and Van, 1998), such that when parents work, then the children will not work. Parents with irregular employment, however, resort to child labour to supplement the household income (Psacharopoulos, 1997).

Household characteristics, such as the household size and its location, as well as the economic conditions at the community level, are important determinants of child labour and schooling. The effect of the number of people in the household (household size) on child labour and schooling depends on whether these members are dependants or working since it affects the household's income and labour availability. A household with more persons will need more income to take care of them and may send the children to the labour market as was found in Peru by Patrinos and Psacharopoulos (1997). On the other hand, if these members are working then a household with more members may not need to resort to child labour. Hence, the composition of the household is more important than the size. This has been recognised in several studies. For instance, Rosati and Rossi (2001) categorised households' members into babies or children, while Nkamleu, (2009) used the dependency ratio of the household. The effect of the number of children on child labour and investment in schooling is explained by the so called 'quantity and quality hypothesis'. Parents in developing countries where insurance markets are incomplete tend to have more children and invest in their education so that these children will care for them when they are old (Pörtner, 2001). However, poor households with no access to financial market tend to have more children so as to use them as labourers.

Also, child labour is considered a rural phenomenon where general economic condition is relatively lower (Rahikainen, 2001; Webbink et al., 2011). This is partly because rural areas have relatively lower access to education and other social amenities. What is more, such areas

tend to depend on agriculture, as is the case with Ghana, where most farmers engage in subsistence farming. With no insurance for their farming activities, child labour becomes the easier option for such households to gain additional income or fall back on in case of income shock. For instance, in rural India, parents withdraw their children from school to work when they expect lower incomes from crop production (Jacoby and Skoufias, 1997).

Regarding the adverse effect of child labour on schooling, initial studies have examined its effect on school enrolment or attendance. For instance, Boozer and Suri (2001) studied the effect of child labour on school attendance among children in Ghana in the late 1980s. Instrumenting for the hours of child work with rainfall variation and income fluctuation, they estimate that an hour of child work reduces school attendance by approximately 0.38 hours. However, in countries where the majority of child labourers combine work and school, and where children work after school or during weekends, analysing the effect of work on school enrolment or attendance may bias the result downwards (Heady, 2003). Hence, recent studies on the relationship between child work and schooling consider different schooling outcomes, such as test scores and educational attainment.

Heady (2003) analyses the effect of child labour on test score performance in Ghana. The results show that work outside the household has a substantial effect on learning achievement. However, one problem in the estimation of the effect of work on school is the issue of endogeneity of the work and/or school. In addressing this issue, Beegle et al. (2004) estimate the causal impact of child labour on educational attainment using two rounds of panel data from the Vietnam Standard Living Survey. They instrument for participation in child labour with rice prices and commodity disaster; and find that child labour reduces the probability of being in school by 30 percent and educational attainment by 6 percent.

Other studies use different instruments to estimate the casual link between child labour and schooling outcome. For instance, Gunnarsson, Orazem and Sanchez (2006) use variation in truancy regulations in cross-countries as instrument. They find out that child work has a negative effect on test scores of 3rd and 4th graders in nine Latin American countries. Similarly, Bezerra et al. (2009) use an instrumental variable approach where the average wage for unskilled male in the state where the child resides is used as instrument. They find that child labour causes a loss in students' school achievement as children who do not work have better school performance than students who work. The effects of child labour on other

educational outcomes have also been examined. For instance, Cardoso and Verner (2006) estimate the effect of child labour (participation and hours) on school drop-out in Brazil. They also use an instrumental variable approach by instrumenting for child work with declared reservation wage (minimum salary acceptance) as instrument for child labour. The result indicates that child labour has no impact on school attendance or drop-out in urban areas.

There are also studies that estimate the effect of child labour on school attainment using schooling-for-age as a measure of schooling outcome. For example, Khanam and Ross (2011) analyse the effect of child labour participation on school-for-age among rural children in Bangladesh with logistic regressions. They find that school attendance and grade attainment (school-for-age) are lower for children who are working. In terms of gender-disaggregated estimates, their results show that the probability of grade attainment is lower for girls than boys. Haile and Haile (2012) also examine the trade-off between child labour and school-for-age in Ethiopia. Unlike Khanam and Ross's (2011) study, however, child labour was measured by the number of hours, instead of children's participation in the labour market. This measurement is better relative to participation in the labour market as it shows the effect of the intensity of the works on schooling. Haile and Haile's (2012) study indicate that longer hours of work reduce the educational attainment of working children.

Finally, Ray and Lancaster (2005) also analyse the impact of child labour on school attendance and school-for-age. However, unlike the above studies on child labour and school-for-age, they use household access to water and electricity as well as households' possession of assets as instrument for child labour. Using data from seven countries (Belize, Cambodia, Namibia, Panama, Philippines, Portugal, and Sri Lanka), they conclude that children's work, even in limited amounts, adversely impact on children's school performance. That is, child labour reduces school attendance and school-for-age. However, it is not clear whether these variables are valid instruments for child labour.

This chapter uses the School-for-Age (SAGE) measure of educational attainment since it captures numerous schooling variables such as late entry into school and repetition. This is so because a child's current grade vis-à-vis his age depends on the age at which he/she enters into school as well as his/her academic performance over the years. Hence, this chapter examines the effect of hours of work on school-for-age (SAGE). Using SAGE makes it

possible to capture the accumulated (long term) effect of child labour on educational performance. To capture the influence of the intensity of work on educational attainment, the hours of child labour per week, instead of the extensive margin of child labour, is used. The chapter also examines the short term effect of work on schooling by investigating the influence of working hours on school attendance hours.

2.3 Methodology

2.3.1 Data

The main data for this study is the sixth Ghana Living Standard Survey (GLSS 6). This is a nationally representative survey collected by the Ghana Statistical Service (GSS). The GLSS 6 used five main questionnaires namely household; non-farm household; governance, peace and security; prices of food and non-food items; and community. This study uses both the household and community data of the GLSS 6. The household questionnaire covers demographic characteristics of respondents; education and skills training; health and fertility behaviour; employment and time use among other household characteristics. The community questionnaire covers general information on facilities available in the communities such as roads, education, health, communication, banking as well as the general wellbeing of the community including wages of agriculture workers.

The survey was undertaken over a period of 12 months from October 2012 to October 2013. The survey design involves a two-stage stratified sampling where in the first stage 1,200 Enumeration Areas (EAs) were selected from the ten regions of the country using probability proportional to the population sizes. These EAs form the Primary Sampling Units (PSUs). A complete listing of all the households in the 1,200 EAs were undertaken to form the Secondary Sampling Units (SSUs) and then fifteen households from each EA were systematically selected bringing the total sample size to 18,000 households. Only 16,772 households, however, were completely interviewed. Out of the 16,772 households interviews, 7,445 are from urban and 9,327 from rural areas. The community survey was done in only 693 rural communities in 655 EAs. Table 2.1 shows the sample size of the GLSS 6 and its disaggregation into rural and urban areas as well as male and female.

Table 2. 1 Sample Composition of Ghana Living Standard Survey 6

	Total	Male	Female	Rural	Urban
Number of EAs	1,200	-	-	655	545
Number of Households	16,772	12,043	4,729	9,327	7,445
Individuals	72,372	35,055	37,317	44,894	27,478
Target Children (5-17 years)	24,372	12,413	11,959	15,787	8,585

Note: For number of households, male and female refer to male headed and female headed households.
Source: GLSS 6

Over 70 percent of these households were headed by men with the remaining heads being women. In all, 72,372 persons were completely interviewed with majority of them located in rural areas and being females. Out of the total number of persons interviewed about 34 percent (24,372) are within the age group 5-17 years. They form the sample for this study. Though the GLSS 6 is a nationally representative survey, it is not self-weighting because households did not have equal chance of been selected into the survey. However, appropriate weights were computed to reflect the probability that a household is selected from an EA in the first and second stage of selection. Detailed information on the survey and calculation of the weights can been found in the GLSS 6 report of 2014[8].

GLSS 6 has some interesting information on children's activities in the last 7 days. This makes it a very good data for child labour and school enrolment analysis. It contains information on whether the child attended school, engaged in any economic activity that can be classified as child labour or hazardous work, worked in the home in the form of household chores or the child was idle. With information on both work and schooling status of children, this paper jointly estimates the work and school decisions. It focuses on questions relating to whether a child (5-17 years) has been involved in any work (child labour or hazardous work) in the last seven days preceding the survey. This question is supposed to be answered by the child or household head in the absence of the child. However, only 11.35 percent of respondents were children, while the majority of the respondent for this question were household heads and parents. Similarly, answers to the questions on children's schooling were largely responded by household heads/parents on behalf of their children.

[8] This is cited as GSS (2014a) in the reference section.

2.3.2 Model Specification and Estimation Strategy

Participation in Child Labour and School

Formal analysis of investment in human capital is based on the theory of human capital. With this theory, individuals choose the level of consumption and allocation of their time so as to maximize the discounted expected future utility (Becker, 1981; Ben-Porath, 1967; Siebert, 1990). However, this standard human capital model is not sufficient to explain child labour and schooling, since the decision-maker is often not the child and the majority of children work in unpaid family enterprises (Canagarajah and Coulombe, 1998). In this situation, the decision maker may be the household head or parent who allocates the total time of all household members so as to maximize a Becker-type of a single utility function.

The decision to involve a child in a specific activity (that is work or school) is dependent on the utility that the household will derive from such activity relative to other activities. The child goes to school if the utility from school is greater than the utility from work; and the child works if the reverse holds. From this, the probability of schooling and working could be estimated separately with a probit or a logit model since the outcome is binary. However, choice of estimation model use in this chapter is influenced by the decision making process. Assuming that the decision to work and/or school is a joint one since work and school compete for the child's non-leisure time, the chapter uses a bivariate probit model to test the interdependence between work and schooling decisions. The latent schooling (Y_1^*) and work (Y_2^*) decision equations are:

$$Y_1^* = \beta_1 X_1 + \varepsilon_1 \quad Y_1 = 1 \; if \; Y_1^* > 0, 0 \; otherwise \tag{1}$$

$$Y_2^* = \beta_2 X_2 + \varepsilon_2 \quad Y_2 = 1 \; if \; Y_2^* > 0, 0 \; otherwise \tag{2}$$

$$E(\varepsilon_1) = E(\varepsilon_2) = 0$$

$$Var\ (\varepsilon_1) = Var\ (\varepsilon_2) = 1$$

$$Cov\ (\varepsilon_1, \varepsilon_2) = \rho$$

And the likelihood equation to be maximized is:

$$L = \prod \int_{-\infty}^{\beta 1' X1} \int_{-\infty}^{\beta 2' X2} \emptyset_2(Z_1, Z_2, \rho)\, dZ_1 dZ_2$$

Where $\emptyset_2$ is the normal density function of the bivariate probit model, which is given by:

$$\emptyset_2\,(Z_1, Z_2, \rho) = 2\pi(1-\rho^2)^{\frac{1}{2}})^{-1} exp^{-\frac{1}{2}}(1-\rho^2))^{-1}(Z_1, Z_2, \rho)$$

The estimates of parameters of interest are obtained by simultaneously equating to zero the derivative of the log likelihood function with respect to the parameters of interest. To ascertain the magnitude of the effect of each of the explanatory variables, the marginal effects of these explanatory variables (Christofides *et al*. 1997) are estimated. These marginal effects are computed at the mean value for continuous explanatory variables; and for dummy explanatory variables, these marginal effects are computed by taking the difference in the joint probabilities evaluated at the two values of the dummy variable.

From equation 1, Y_1 equals to 1 if the child is still enrolled in school and 0 otherwise. Y_2 equals to 1 if the child engaged in child labour or hazardous work for cash or in-kind benefits to the family in the last seven days, and 0 otherwise. The coefficient of correlation between the error terms (ρ) allows us to measure the correlation between the outcomes after considering the effects of the explanatory variables. X_1 and X_2 are vectors of explanatory variables that influence the schooling and work decisions respectively. The same vector of covariates is included in the two equations. This means that the system is just identified (Haile and Haile, 2012).

Hours of Child Labour

Maximisation of the household utility subject to both income and total time constraints results in the number of hours of work per day (H_w). Given that schooling hours are fixed and the total daily hours is normalised to one, the choice available from the household utility maximisation problem is the hours of work. This maximisation of the household utility might lead to a corner solution where zero hours of work will be supplied and it becomes positive afterwards. With $H^*{}_w$ as the latent variable, the hour's equation is given by:

$$H_w = \begin{cases} \beta_1\alpha_i + \beta_2 X_i + \varepsilon_i & if\ H^*{}_w > 0 \\ 0 & if\ H^*{}_w \leq 0 \end{cases} \qquad (3)$$

Where H_w is the number of hours of work per week by a child; β_i is a vector of unknown parameters and ε_i is the error term which is normally distributed with mean zero and σ^2as the variance. X_i is a vector of child, parent, household and community as well as schooling

characteristics likely to affect the hours of work. Hence, the hours of work per week (H_W) equation to be estimated is:

$$H_W = \beta_W X_w + \varepsilon_W \quad (4)$$

Estimating equations (4) by Ordinary Least Square will lead to an inconsistent estimate since the specification corresponds to a left censored model at 0. Majority of the children reported 0 hours of work. For this reason, a tobit model is used to estimate the parameters β_W.

Children not involved in the labour market have zero hours of work, while the weekly hours of working children were positive. Hence, the tobit model includes both the censored (hours equal zero) and the uncensored (hours are positive) in the estimation. The marginal effects can be computed on the latent dependent variable, conditional expectation of hours being positive and unconditional expectation. Since our interest is on factors that influence working children's hours, the marginal effect is computed at positive values of hours of work (i.e. when working hours are positive).

Effect of Hours of Child Labour on Schooling

Though a negative and significant coefficient of rho (ρ) in the bivariate probit estimation will indicate a trade-off between schooling and work, this does not show the extent to which work influences education. Also, in terms of policy, the effect of hours of work on educational attainment is more important relative to a negative trade-off between participation in work and school. Children who work for longer hours are more likely to spend lesser hours on class attendance as well as for studying at home or doing home based works (assignments). Also, these children are less likely to be attentive inside and outside of the classrooms due to fatigue from work. This may have adverse effects on their educational performance and attainment. Thus, child labourers are more likely to start school late and also have higher repetition rates. To explore this trade-off between work and school further, the chapter estimates the association between hours of work and educational outcomes which is measured with hours of class attendance and age-adjusted educational attainment of children (school-for-Grade). Similar to the hours of work equation and with ${H^*}_s$ as the latent variable, the hours of class attendance per week is given by:

$$H_s = \begin{cases} \beta_1 \alpha_i + \beta_2 X_i + \beta_3 H_w + \varepsilon_i & if\ {H^*}_s > 0 \\ 0 & if\ {H^*}_s \leq 0 \end{cases} \quad (5)$$

Where H_s is number of hours of class attendance per week for a child s. β_i is a vector of unknown parameters and ε_i is the error term which is normally distributed with mean zero and σ^2as the variance. X_i is a vector of child, parent, household and community as well as schooling characteristics likely to affect the hours of class attendance. Hence, the hours of class attendance per week (H_s) equation to be estimated is:

$$H_s = \beta_i X_i + \beta_w H_w + \varepsilon_s \quad (6)$$

Where H_s and X_i are as defined above. Here β_w is our coefficient of interest that measures the effect of hours of work on class attendance and it is expected that to be negative. H_w is the log of weekly of hour of child labour. Since children who are not in school will have zero hours of class attendance, a tobit model is used.

Since most child labourers in Ghana combined work and school, they tend to forgo leisure and work after school or during holidays. Hence, finding the effect of child labour on class attendance may not be the ideal way to capture the potential negative effect of work on education. Using leisure hours for work may make children too tired to study at home or to concentrate at school (Gunnarsson et al., 2006). This point has been recognised by most recent empirical studies (Heady, 2003; Gunnarsson et al., 2006; Khanam and Ross, 2011; Rosati and Rossi, 2003) that argue that school enrolment or class attendance are only indicators of time spent on schooling and not schooling outcomes. The potential negative effect of work on schooling is investigated further through an assessment of the effect of hours of work on educational attainment (SAGE) with a probit model where the latent equation for the variable of interest is given by:

$$S^* = \gamma H_w + X'\beta + \varepsilon \quad (7)$$

Where γ is the parameter of interest that measures the effect of hours of work on educational attainment (S^*). H_w is the log of a child's hours of work per week and X is a vector of explanatory variables that affect a child's educational attainment. ε is normally distributed error term with mean of zero and homoscedastic variance. The observable variable (educational attainment) is given by:

$$S = \begin{cases} 0 \; if \; S^* \leq 0 \\ 1 \; if S^* > 0 \end{cases} \quad (8)$$

$$S^* = \begin{cases} 0 \; if \; SAGE \; \geq 100 \\ 1 \; if \; SAGE < 100 \end{cases} \quad (9)$$

The School-for-Age (SAGE) measure of educational attainment as outlined by Psacharopoulus and Yang (1991) is given by:

$$SAGE = \left(\frac{Years \; of \; schooling}{(Child'sAge - NS)} * 100\right) \quad (10)$$

Where NS is the national primary school entry age and this is the sixth year for children in Ghana (Keteku, 1999). The years of schooling refers to the years of schooling completed; such that a child in primary two has one year of schooling. From the formula above, SAGE takes the value of 100 or above (indicating the child has attained the maximum number of years possible to date or above the maximum due to early school entry or promotion in class); below 100 and 0 (implying the child has never attended school). A child with SAGE score of less than 100 is 'falling behind' in his/her education; and hence all children with SAGE score of under 100 are considered as having below normal grade progression in the school system. Following Ray and Lancaster (2005) and Khanam and Ross (2011), the SAGE scores are converted into a dichotomous variable that takes the value 1 if a child has below normal school progression (that is 0<SAGE < 100) and he/she is falling behind in the schooling system, and 0 otherwise (SAGE≥ 100).

Using the SAGE formula presented in equation (10) implies that children who are in their first year of schooling and are six years old will have an infinite value since the denominator is zero (that is Age– NS = 0). To avoid such infinite values the sample is restricted to children aged 7-17 years for the SAGE specifications. Also, if a child starts school before he/she reaches the national minimum primary school entry age of six then SAGE potentially can be greater than 100, such children are added to those with SAGE score equal to 100 since they are few. The marginal effect of the probit estimation is computed to get the effect of an hour of work on educational attainment (SAGE).

Endogeneity of Child Labour and Schooling

Treating child labour participation as exogenous variable could bias the estimate of the effect of work on schooling. An unbiased estimate of the effect of work on school can be obtained through an instrumental variable estimation approach. With this approach, a valid instrument

for child labour is needed and such variable should strongly affects child labour, but should have no direct effect on schooling. Such valid instruments, as noted by Ray and Lancaster (2003), are difficult to find in most household datasets. Most empirical studies (Patrinos and Psacharopoulas, 1997; Sánchez et al., 2003; Khanam and Ross, 2011; Haile and Haile, 2012; Amin et al., 2006) on the effect of child labour on education have treated child labour as an exogenous variable, though a few (Bhalotra, 1999; Gunnarson et al., 2003; Ray and Lancaster 2003, 2005) have tried to instrument for it. According to Khanam and Ross (2011, p 700), "such studies that have tried to control for endogeneity of child labour have relied on some strong and rather arbitrary identification restrictions ….. and none of these studies have tested the validity of the instruments used", thereby bringing into question the validity of these instruments.

Since there is no valid instrument for child labour in GLSS6 dataset, an instrumental variable approach is not applied in the estimation of the effect of child labour on educational attainment. Hence, the results show an association between child labour and educational attainment and causal inference cannot be made from them. Also, unlike other studies, such as Khanam and Ross (2011) who use the extensive margin of child labour, child work is measured as hours of work per week (intensive child labour) in this paper.

Definition of Variables

As indicated earlier, the outcome variables of interest in this chapter are child labour (hazardous work) and schooling. Child labour is defined in this paper according to what was stated in section 1.3.1. Thus, for children aged between 5 and 14 years, their engagement in any work (excluding household chores) for pay, profit or gain is considered child labour; while for children aged between 15 and 17 years, their engagement in any work (excluding household chores) for pay, profit or gain is considered child labour only if such work is hazardous in nature based on the definition of hazardous child labour provided in section 1.3.1. Child labour (Y_2) is a dummy variable which equals to 1 if a child was engaged in child labour in the last seven days preceding the survey and 0 otherwise. Hazardous work refers to the involvement of children (5-17 years) in works that are hazardous in nature based on the definition of hazardous works in section 1.3.1 and it is coded 1 if a child was engaged in hazardous work in the last seven days before the survey and 0 otherwise. The hours of child labour (hazardous work) is the total number of hours of child labour (hazardous work) done by a child in a week. In terms of schooling, enrolment (Y_1) is a dummy variable which

equals 1 if a child is still in school and 0 otherwise, while hours of class attendance refer to the weekly total number of hours of class attendance of a child.

The explanatory variables used in these regressions are child, parent and household characteristics, as well as schooling and community variables. Child characteristics include the child's age, square of his/her age, gender and his/her relationship to the household head. Parent's employment status and their levels of education, as well as whether they stay in the household are also included. In terms of household characteristics, the age, gender and marital status of the head; the number of children, presence of elders (persons above 60 years) in the household; household size; per capita expenditure; livestock ownership; land ownership and size; receipt of remittance and the location of the households are included in the estimation. Also, schooling cost and type of school that the child attends are included. The inclusion of the later variable is meant to capture school quality since private primary schools often outperform public ones in Ghana (Heyneman et al., 2009).

Finally, community variables comprising of distance to the nearest to primary and Junior High school; and daily wages of children in farming were collected for sub-sample of communities. These variables are included and a different regression estimated for this sub-sample. Again, as stated earlier, children's works analysed in this paper include child labour and hazardous works. See tables A1 and A2 in the appendix for detail definition of these variables and their descriptive statistics.

2.4 Child Labour and Schooling in Ghana: Tabulation Results

Child Labour[9] and School Participation

National estimates of child workers and their characteristics masked some of the peculiar characteristics of child workers located in different part of the country. Hence, using the dataset, this section examines the characteristics of child workers residing in either an urban or a rural area. Although the national participation rate of boys in economic activity is 29.2 percent that of the rural boys is as high as 39 percent against 15 percent for urban boys.

[9] Child labour refers to the involvement of children (5-17 years) in any economic activity for cash or in-kind benefits but it excludes household chores. The definition of hazardous works used here is same as the definition given in section 1.3.1. Economic activity includes both child labour and hazardous works but it excludes household chores.

Similarly, rural boys have higher participation rate for child labour (33 percent) and hazardous works (20 percent) in comparison to national estimates. Table 2.2 shows the profile of a boy and a girl child worker living in either a rural or an urban area. Though rural boys have higher participation rates in economic activity, child labour and hazardous works than rural girls, the reverse holds for those from urban areas. For instance, urban girls' participation rates in child labour and hazardous works are 16 percent and 12.3 percent as against that of boys which are 15 percent and 11.84 percent respectively. Similar results are observed with respect to the hours of work done by children in a week. While rural boys work more hours than rural girls, in urban areas, girls work more hours than boys.

Table 2. 2 Profile of a Child Worker in Ghana in 2013

	Boy		Girl	
	Rural	Urban	Rural	Urban
Average age	12.2	12.79	12.1	12.82
Average age of starting work	8.6	9.5	8.6	9.8
Proportion engaged in economic activity	38.72	14.6	34.86	15.85
Proportion involved in child labour	32.82	11.84	28.39	12.31
Proportion involved in hazardous works	19.64	7.45	15.92	7.68
Proportion engaged in household Chores	74.84	73	80.81	80.51
Average hours in economic activity in a week	21.39	17.42	19.17	19.96
Average hours in child labour in a week	22.15	18	19.7	20
Average hours in hazardous work in a week	27	21	24	25
Average hours in household chores in a week	6	7	12	11
Proportion in School	78.93	86.98	81.46	83.03
Average hours of school attendance per week	26	29	26	29
Average hours of class missed per week	2.65	2.32	2.56	2.14
Average hours of homework per week	0.51	1.61	0.59	1.55
Proportion working in Trading	5.58	30.05	12.55	50.94
Proportion working in Agriculture	91.7	60.93	83.25	39.89

The above seems to suggest that while child labour is dominated by boys in rural areas, in urban areas it is girls dominated. This might be explained by the kind of child workers found in these areas. Rural child labourers are usually from the community and near-by communities. Hence, they tend to be involved in household unpaid activities or other agricultural based works. However, in the case of urban areas, child workers are usually migrants who have migrated to the urban centres of the country for work. They are usually involved in petty trading and protégé of loads (locally called *kayayei*) in the various urban

markets, as well as serving as domestic home-helps. These are 'female activities' in the Ghanaian culture and a reason for the dominance of female child workers in urban areas.

This segregation of works by gender is confirmed by sector of employment of child workers in urban and rural areas. The proportion of girls found in trading is more than boys in both rural and urban areas. Again, on average a child worker in an urban area is relatively older than his counterpart in a rural area. This is true for both sexes with average ages of 13 years and 12 years for urban child and rural child worker respectively. This is supported by the age at which a child starts to participate in the labour market. On average an urban boy/girl child worker starts working at the age of 10 years, while a child in a rural area starts working at age 9 years.

Finally, similar to the national enrolment rates among urban and rural children, school enrolment rate among child workers in urban areas is 87 percent for boys and 83 percent for girls against 79 percent and 81 percent for boys and girls in rural areas respectively. It is surprising that in rural areas, the school enrolment rate of female child workers is higher than male child workers. Again, rural child workers spent lesser hours in school than their urban counterparts. A child worker in a rural area spends about 26 hours in a week in class while an urban child worker spends about 29 hours in a week in school. Similarly, urban child workers spend relatively more hours (about 2 hours in a week) on 'homework' or house studies than those in rural areas.

Another feature of child labourers in Ghana is that most of them combined work with schooling. Table 2.3 shows school and labour market participation of children in Ghana. From table 2.3, the proportion of girls that attend school only (64 percent) is higher than boys enrolled in school only (62.67). Also, the proportion of children attending school only reduces while the proportion in the labour market increases as their ages increase. This may be explained by the fact that children become stronger physically and psychologically as they age and, hence, the rewards from work are likely to be higher for older children than young ones. Also, the phenomena of combining work and school is prominent in rural areas. Furthermore, school participation (child labour participation) increases (decreases) with households' income as school enrolment rate (child labour participation rate) is higher (lower) among children in households with higher expenditure quintile.

Table 2. 3 Labour Force and School Participation Among Children in 2013

	School only	Work only	School & Work	None (Idle)
Gender				
Male	62.67	6.06	24.58	6.69
Female	64.67	5.06	22.72	8.1
Age group				
5-9 years	74.67	2.29	13.12	9.91
10-13 years	61.22	4.67	30.54	3.57
14-17 years	48.62	11.7	31.59	8.09
Expenditure Quintiles				
Lowest	51	9.23	28.23	11.54
Second	60.15	5.92	26.27	7.67
Third	67.14	4.23	22.11	6.52
Fourth	70.86	3.88	20.88	4.37
Highest	77.24	1.96	16.8	4
Location				
Urban	79.71	2.31	12.94	5.04
Rural	54.46	7.35	29.53	8.66
Accra	88.12	1.7	4.37	5.81
Other Urban	77.86	2.44	14.82	4.87
Rural Coastal	72.66	2.53	16.95	7.86
Rural Forest	59.88	3.99	31.22	4.9
Rural Savannah	47.86	10.35	30.59	11.21

Source: Author's Calculation from GLSS 6

Intensity of Work and Schooling

The intensity of work undertaken by children is very important in the definition of child labour and in examining the effects of work on children's development. Majority of child labourers are enrolled in the education system in Ghana (Canagarajah and Coulombe, 1998). Working children are able to combine work and school because they work during the weekends, missed school days, before or after school and during vacation. Attending school may have a negative effect on work since it reduces the number of hours available for work. Children who combine work and school tend to work for lesser hours relative to working children who do not attend school as indicated in table 2.4.

Again, table 2.4 shows that while the majority (45 percent) of child labourers who do not attend school work between 15-42 hours in a week; for working children who are in school, the majority (about 63 percent) of them work for 1-14 hours per week. This pattern is true for

both male and female child labourers as well as rural and urban children in the labour market. Again, the number of hours of work increase as the child grows, as older children work for longer hours than younger ones, irrespective of whether the former attends school or not. Furthermore, the ILO considers children working for 43 or more hours per week as engaging in the worst form of child labour. From table 2.4, about 35 percent of child workers not in school are found in the worst form of child labour against only 4.6 percent of child labourers in school. Finally, the proportion of urban child labourers (44 percent) found in the worst form of child labour (i.e. working more than 43 hours per week) is higher than proportion of child labourers in rural areas (31.2 percent).

Table 2. 4 Weekly Hours of Work and School Attendance Status in 2013

	Currently Attending School			Not Attending School		
Hours	**1-14**	**15-42**	**43+**	**1-14**	**15-42**	**43+**
All	62.9	32.5	4.6	20.3	45	34.7
Boys	63.5	31.9	4.7	21.5	45.1	33.4
Girls	62.4	33.2	4.4	19	45	36
Urban	64.9	32.3	2.7	23.8	32.2	44
Rural	62.1	32.6	5.3	19	49.8	31.2
Age Groups						
5-7 years	71.1	24.6	4.3	29.5	34.7	35.8
8-11 years	66.9	28.2	4.9	24.2	40.8	35
12-14 years	62.2	34.1	3.7	23.4	46.1	30.5
15-17 years	56.2	38.5	5.3	16.1	47.6	36.3

Source: Author's Calculation from GLSS 6

Child Labour and Educational Attainment (SAGE)

In spite of the progress achieved in the country's educational sector, late entry into primary school and repetition rates remain a serious issue in Ghana. For example, about 60 percent of 6-year-old children and 45 percent of 7- year-old children in rural areas were not in school in 2010 (Darvas and Balwanz, 2013). Also, grade repetition is very common in primary school grades 1 and 6, with about 11 percent and 22 percent of children repeating these grades respectively in 2011 (GSS, 2011). Late school entry and high repetition rates have been cited for the wide disparities between GERs and NERs in the country. For instance, primary school GER in 2014 was 99.1, but NER was only 69.6 in the same year (UNDP, 2015). The working status of a child can have a significant effect on their school entry age as well as repetition. Thus, working children are more likely to start school late if they choose to enrol in school at all; and also perform poorly in school due to absenteeism or inattentiveness in

class. Such children are less likely to study at home, since most child labourers use off-school hours to work.

The school-for-Age (SAGE) or Grade-for-Age has become an important educational outcome for assessing the educational attainment of children since it adjusts for a child's age. SAGE can be classified into three: Below SAGE, Normal SAGE and Above SAGE. Children with the Normal SAGE are those with educational attainment commensurate with their ages, while Above SAGE children have educational attainments that are above the required level based on their ages. Below SAGE children are lagging behind in terms of their educational attainment; they are of concern to policymakers. Table 2.5 shows the percentage of children who are above, normal and below their required educational attainment.

Table 2. 5 Educational Attainment (SAGE) and Children's Activities

	Boys		Girls		Rural		Urban		All	
	School Only	School & Work	School Only	School & Work	School Only	School & Work	School Only	School & Work	School Only	School & Work
Right	17	6	18	7	12	6	23	10	18	7
Below	78	91	76	90	84	92	70	87	77	91
Above	5	3	6	3	4	2	7	3	5	2

Source: Author's calculation from GLSS 6

Overall, the majority of children's educational attainments are below what is required for their ages; and this is worse among children that combine schooling with work. For example, while 77 percent of the children who attend school only have educational attainment level below normal, as high as 91 percent of children who combine school with work fall into this category. Also, girls have relatively better educational attainment than boys, whether such girls are attending school only or combining schooling with working. Furthermore, the percentage of urban children with below normal educational attainment is lower than children in rural areas.

2.5 Regression Results and Discussion

As stated earlier, the chapter examines the joint decision of sending children to school or work with a bivariate probit model. Two types of child works are considered, namely child labour and hazardous works. Tables 2.6 and 2.7 show the marginal effects from the bivariate

probit estimation of schooling and child labour decisions; while tables 2.8 and 2.9 show the marginal effects of the joint estimation of the decision to send children to school or to engage them in hazardous works. Tables 2.6 (model 1) and 2.7 (model 2) are the same, except that table 2.7 (model 2) include community variables that are important to the decision to send children to school or work. Similarly table 2.9 includes these community variables while table 2.8 does not. Since the community questionnaire was administered only in rural areas, the results in tables 2.7 and 2.9 are for rural children only.

In line with expectations, the coefficient of correlation (rho) between the errors in the two equations is statistically significant for both the overall sample, as well as the split samples for both child labour and school decisions; and hazardous work and schooling. This justifies the use of the bivariate probit model to jointly estimate these two binary equations.

2.5.1 Participation in Work and School

Child Labour and School Participation

The negative and significant values of the coefficient of correlation (rho) in tables 2.6 and 2.7 show that there is a trade-off between the choice of sending a child to school or work. Thus, the decision to send a child to work is dependent on the schooling decision and vice versa. This trade-off is stronger for boys as the value of rho is higher in the sub-sample of boys relative to girls (see tableA3-A4 in the appendix).

From table 2.6, boys are less likely to engage in child labour, but they have a higher probability of going to school relative to girls. Being a boy is associated with a decrease in the probability of working of approximately 0.04 percentage points and an increase in the probability of schooling of 9 percentage points all things being equal. This contradicts earlier studies (Blunch et al., 2002; Canagarajah and Couloumbe, 1998) in Ghana that found gender to have no effect on the likelihood of a child working and schooling. The results, however, are comparable to Haile and Haile's (2012) study in Ethiopia, which shows that male children are more likely to attend school compared to female children. The significance of gender disappears once community variables are included and the sample restricted to only children in rural areas (table 2.7). This may be as a result of the definition of child labour used, which excludes children's engagement in household chores where girls are prominent.

Also, contrary to expectations, sons and daughters of the household head are more likely to engage in child labour and less likely to attend school. This may be because the majority of the children in our sample are related to the household head directly and households usually use their own children for work. Bhalotra and Heady (2001) also found similar results in Ghana. In addition, the probability that a child will be involved in child labour is positively associated with his/her age, but the probability declines after a certain age (non-linear relationship) as indicated by the negative significance of the square of a child's age. Thus, older children have a higher probability of working in both models. All things being equal, table 2.6 shows that the probability of engaging in child labour is associated with an increase of 0.06 percentage points with an additional year. However, age has no association with schooling decision. The findings in this study corroborate an earlier study on child labour in Ghana by Blunch and Verner (2002), which shows statistically significant positive result for age (17 percentage points increase) and a negative statistically significant result for age squared (0.7 percentage points decrease).

In terms of parent characteristics, children whose fathers have primary education or above are less likely to engage in child labour, but more likely to attend school relative to children with fathers who have no education. The educational level of the father has a stronger association with schooling than with work. The influence of the father's education on both work and school is even larger once the child wage and distance to the nearest primary or junior high school are controlled. This supports the existing evidence (such as Emerson and Souza, 2006) which show that a father education has a greater positive and negative influences on schooling and child labour respectively. This may be explained by the fact that educated fathers know the negative effect of work on children's human capital development vis-à-vis the positive effect of schooling on their future welfare. However, the educational level of a mother has no significant association with the working status of her children, though it increases their probability of school enrolment.

The employment status of the father and mother has positive and negative correlations with child labour and school enrolment respectively. This is contrary to the theoretical prediction that when the parents are employed child labour reduces and schooling increases. This is could be attributed to the fact that in Ghana, and other developing countries, most parents are self-employed, hence their children tend to support them. Also, most children grow up doing similar jobs as their parents since parents might believe that "training by doing" has more

value than education (Bass, 2004; Smits and Gunduz-Hosgor, 2006). This finding supports earlier works (e.g. Francavillia and Gianelli, 2007) which show that children work more when their mothers are working. The result, however, contradicts the findings of other studies (Sakellariou and Lall, 1998; Cartwright, 1999) that found the employment of the mother to negatively affect the likelihood of child labour occurring. Again, the results of this study indicate that the presence of the mother in the household has a positive association with the probability of child labour in the family, but has no association with school enrolment. However, the presence of the father has no association with the probability to work or school.

Furthermore, the probability of engaging in child labour for children from male headed households is 0.2 percentage point higher than their counterpart from female headed households. Also, the probability of participation in schooling is 4 percentage points lesser for children in male headed households. Again, children in households where the head is married are less likely (about 0.2 percentage point lower) to engage in child labour and 2.6 percentage points more likely to attend school. This may be explained by the fact that married household heads have additional income from their spouses; hence, they are more likely to send their children to school than to the labour market. In addition to the factors above, household composition, its location and wealth have all been linked to child labour in most empirical studies (Ray, 2000; Beegle et al., 2006). In terms of household composition, the chapter takes into account the number of children, the presence of elders (persons above 60 years) and the household size. Though these variables have the predicted signs (i.e. positive coefficient for child labour and negative for schooling), they are not statistically significant.

In addition, the findings show that while household income has no association with schooling and working decisions, household wealth does. An increase in household wealth is associated with a reduction in the probability of child labour of 0.03 percentage points and an increase in schooling probability of 0.4 percentage points. This supports Kruger et al. (2007) who report that household wealth leads to a reduction in child labour and an increase in schooling among Brazilian children. Also, ownership of livestock by a household is associated with an increase in the likelihood of child labour of 0.05 percentage points, but it has no association with school participation, and it becomes insignificant once community variables are included (table 2.7).

Table 2. 6 Correlates of School and Child Labour Participation for Children (Model 1)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Boy	-0.000441**	(0.000216)	0.00878***	(0.0031)
RelH	0.00275***	(0.000699)	-0.0383***	(0.00745)
Age	0.000575***	(0.000197)	0.00487	(0.00438)
Age2	-0.000017**	(0.000008)	-0.000473**	(0.000204)
FatherEduPrim	-0.00173**	(0.000757)	0.0368***	(0.00928)
FatherEduSec	-0.00112**	(0.000544)	0.0224***	(0.00711)
MotherEduPrim	-0.000637	(0.000438)	0.0273***	(0.00832)
MotherEduSec	0.000386	(0.000427)	-0.011	(0.00809)
FatherEmptsta	0.00872***	(0.0016)	-0.0990***	(0.0145)
MotherEmptsta	0.00977***	(0.00187)	-0.0987***	(0.0197)
FatherHH	0.000009	(0.000527)	0.00337	(0.00896)
MotherHH	0.00116**	(0.000509)	-0.00821	(0.00817)
HeadAge	0.00005	(0.0004)	-0.000523	(0.000693)
HeadAge2	-0.00002	(0.0003)	0.00203	(0.00631)
MaleHead	0.00248***	(0.00069)	-0.0402***	(0.00621)
HeadMar	-0.00164***	(0.000459)	0.0264***	(0.0046)
NoChildren	0.000108	(0.000104)	-0.00149	(0.00168)
Elders	-0.000246	(0.000311)	0.00585	(0.00512)
Ownland	-0.00005	(0.000211)	0.00164	(0.00357)
Landsize	-0.00011	(0.00015)	0.00075	(0.00203)
Ownlivestock	0.00055**	(0.000265)	-0.00563	(0.00411)
HHsize	-0.00054	(0.0077)	0.000542	(0.00127)
RurUrb	-0.000474*	(0.000266)	0.00596	(0.00418)
Remittance	-0.000048	(0.000449)	0.0021	(0.00756)
AssetIndex	-0.000257***	(0.000081)	0.00370***	(0.000967)
LogExpCapita	0.000198	(0.000141)	0.00152	(0.00264)
LogTotalEduexp	-0.000708***	(0.000261)	0.00815**	(0.00392)
Rho	-0.2556	0.0286		
Wald Test, rho=0; chi2(1) Pro		72.953	0.0000	
Log Pseudolikehood		-3631980		
Sample		22,260		

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

Furthermore, in line with expectations, there is a positive relationship between schooling expenditure (proxied by school expenditure per annum per cluster) and child labour. An additional Ghana cedis increase in school expenditure is associated with 0.07 percentage points increase in the probability of child labour and 0.8 percentage points reduction in the likelihood of schooling. The influence of schooling cost on school and child labour participation is even larger in rural areas (table 2.7). This supports studies (Drèze and

Kingdon, 2001; Leclercq, 2002) that view access to education as a sure way of reducing child labour.

Table 2. 7 Correlates of School and Child Labour Participation for Children (Model 2)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Boy	-0.000324	(0.00043)	0.00362	(0.00527)
RelH	0.00360***	(0.00125)	-0.0473***	(0.0138)
Age	0.000700*	(0.00041)	-0.0125	(0.00974)
Age2	-0.0017	(0.0019)	0.000404	(0.00047)
FatherEduPrim	-0.00545**	(0.0022)	0.0609***	(0.0166)
FatherEduSec	-0.00338**	(0.00158)	0.0351***	(0.0121)
MotherEduPrim	-0.00159	(0.00116)	0.0251*	(0.0136)
MotherEduSec	0.000164	(0.00104)	-0.0037	(0.0132)
FatherEmptsta	0.0150***	(0.00275)	-0.202***	(0.032)
MotherEmptsta	0.0166***	(0.00317)	-0.226***	(0.0429)
FatherHH	0.000412	(0.00118)	-0.00721	(0.016)
MotherHH	0.00197*	(0.00109)	-0.0267*	(0.0145)
HeadAge	0.00012	(0.00092)	-0.000218	(0.00118)
HeadAge2	-0.0017	(0.0872)	0.000751	(0.00109)
MaleHead	0.00418***	(0.0013)	-0.0533***	(0.0115)
HeadMar	-0.00292***	(0.00093)	0.0371***	(0.00792)
NoChildren	0.000291	(0.000213)	-0.00397	(0.00274)
Elders	0.000454	(0.00068)	-0.00636	(0.00872)
Ownland	-0.000571	(0.00045)	0.00706	(0.00548)
Landsize	0.000032	(0.000081)	-0.000034	(0.000109)
Ownlivestock	0.000675	(0.000574)	-0.0091	(0.00732)
HHsize	-0.000141	(0.000156)	0.00207	(0.0021)
Remittance	-0.00032	(0.000923)	0.00453	(0.0117)
AssetIndex	-0.000286*	(0.000171)	0.00356*	(0.00198)
LogExpCapita	0.000386	(0.000293)	-0.00583	(0.00435)
LogTotalEduexp	-0.00167***	(0.000588)	0.0222***	(0.00693)
DistPrimary	0.000206**	(0.000088)	-0.00248***	(0.000845)
DistJHS	0.000136***	(0.00005)	-0.00165***	(0.000419)
Childwage	0.00009**	(0.00004)	-0.00117**	(0.000579)
Rho	-0.1771	0.036		
Wald Test, rho=0; chi2(1) Pro		23.182	0	
Log Pseudolikehood		-1984317.8		
Sample		12.891		

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

With respect to the community variables, table 2.7 shows that distance to nearest primary school is associated with an increase in the probability of child labour of 0.02 percentage points and a reduction in school participation of 0.21 percentage point. Similar results were found for distance to the nearest JHS. This shows that not only is financial access to education important to parents in deciding on their children's activities (schooling or child labour), but physical access to education is equally important. The findings here corroborate earlier studies in Ghana (Canagarajah and Coulombe, 1998; Chao and Alper, 1998; Blunch and Verner, 2000) and other developing countries such as Vietnam (Beegle et al., (2009). Also, as expected, children in urban areas are less likely to engage in child labour in comparison to rural children, but urban location has no effect on schooling. Finally, an increase in the daily agriculture wage of children is associated with 0.09 percentage points increase in child labour and 0.12 percentage points reduction in schooling. Similar result was obtained by Robles-Vásquez and Abler (2000). They attempted to measure the wage elasticity and found that the wage elasticity of labour supply among Mexican boys is very small. The results from the split samples confirm the above findings of this thesis though there are few differences (see tables A3 and A4 in the appendix).

Hazardous Work and Schooling Participation

Hazardous[10] child labour is considered as the worst form of child labour as it poses more danger to the health, safety and morals of a child. As noted by Rogers and Swinnerton (2008), the worst form of child labour can do damage to children. Owing to data constraints on hazardous child labour, there is a dearth of empirical literature on the determinants of hazardous child labour. Few studies have tried to explain its existence including Dessy and Pallage (2005). They suggest that such works pay better than other jobs available to children, and it is this compensating wage differential that account for the existence of hazardous child labour. However, Rogers and Swinnerton (2008) attributed the existence of this form of child labour to imperfect information on the part of parent, since they may not know the exploitative nature of these works. This study contributes to this literature by examining the factors that are associated with children's participation in hazardous works or school.

[10] As stated earlier, according to the Ghana Child Labour Act, hazardous child labour include children engagement in activities such as going to sea, works in mining and quarrying sectors, porterage of heavy loads, works in manufacturing industries where chemicals are produced or used, works in places where machines are used, works in places such as bars, hotels and places of entertainment where a person may be exposed to immoral behaviour, as well as night works that occurred between 8pm and 6am.

Table 2. 8 Correlates of School and Hazardous Work Participation (Model 1)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Boy	-0.000643**	(0.000269)	0.00929***	(0.00322)
RelH	0.00285***	(0.000699)	-0.0344***	(0.00745)
Age	-0.00095***	(0.000287)	0.0173***	(0.00306)
Age2	0.00007***	(0.0001)	-0.00119***	(0.000135)
FatherEduPrim	-0.00371***	(0.00105)	0.0465***	(0.00979)
FatherEduSec	-0.00171**	(0.000772)	0.0218***	(0.00757)
MotherEduPrim	-0.00114*	(0.000594)	0.0275***	(0.00835)
MotherEduSec	0.000426	(0.00059)	-0.0103	(0.00821)
FatherEmptsta	0.00786***	(0.00119)	-0.0817***	(0.0107)
MotherEmptsta	0.00719***	(0.000998)	-0.0661***	(0.00816)
FatherHH	0.000781	(0.000723)	-0.00443	(0.00945)
MotherHH	0.000382	(0.000572)	-0.000288	(0.00743)
HeadAge	-0.000049	(0.000055)	0.000445	(0.000712)
HeadAge2	0.000068	(0.000052)	-0.00074	(0.00066)
MaleHead	0.00243***	(0.000578)	-0.0341***	(0.00603)
HeadMar	-0.000850**	(0.000381)	0.0154***	(0.00452)
NoChildren	0.00017	(0.000135)	-0.00189	(0.00174)
Elders	-0.000391	(0.000407)	0.00636	(0.00529)
Ownland	-0.000345	(0.000274)	0.00413	(0.00363)
Landsize	0.000094	(0.00015)	-0.00013	(0.00195)
Ownlivestock	0.000722**	(0.000316)	-0.0068***	(0.000404)
HHsize	-0.00671	(0.000103)	0.000625	(0.00132)
RurUrb	-0.000203	(0.000321)	0.00272	(0.0042)
Remittance	-0.00117***	(0.000634)	0.0123	(0.00802)
AssetIndex	-0.00042***	(0.000097)	0.00481***	(0.00103)
LogExpCapita	0.00154***	(0.000195)	-0.0124***	(0.00265)
LogTotalEduexp	-0.00091***	(0.000301)	0.00927**	(0.00384)
Rho	0.29502	0.02956		
Wald Test, rho=0; chi2(1) Pro			88.211	0.0000
Log Pseudolikehood				3471923.3
Sample			22,260	

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

Similar to child labour, boys are less likely to engage in hazardous works, but more likely to enrol in school as presented in table 2.8. Also, children of the household head are more likely to engage in hazardous child labour, but the probability of them being enrolled in school is lesser than children not related to the household head. The probability of engaging in hazardous works is positively associated with age at an increasing rate.

Table 2. 9 Correlates of School and Hazardous Works Participation (Model 2)

Independent Variables	Hazardous work Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Boy	-0.00064	(0.000476)	0.00701	(0.00516)
RelH	0.00282**	(0.00119)	-0.0322**	(0.0128)
Age	-0.00179***	(0.000536)	0.0190***	(0.00499)
Age2	0.000129***	(0.00003)	-0.00140***	(0.00022)
FatherEduPrim	-0.00897***	(0.00258)	0.0813***	(0.0177)
FatherEduSec	-0.00569***	(0.00196)	0.0447***	(0.013)
MotherEduPrim	-0.00157	(0.00116)	0.0241*	(0.0132)
MotherEduSec	0.000171	(0.00116)	-0.00356	(0.0131)
FatherEmptsta	0.00958***	(0.0016)	-0.112***	(0.0131)
MotherEmptsta	0.0108***	(0.0016)	-0.127***	(0.0136)
FatherHH	0.00126	(0.00136)	-0.0159	(0.0153)
MotherHH	0.000661	(0.00111)	-0.00782	(0.0126)
HeadAge	-0.000132	(0.0001)	0.00151	(0.00111)
HeadAge2	0.000012	(0.00092)	-0.00013	(0.00103)
MaleHead	0.00335***	(0.000989)	-0.0372***	(0.0104)
HeadMar	-0.000559	(0.000639)	0.00486	(0.00727)
NoChildren	0.000401*	(0.000239)	-0.00475*	(0.00263)
Elders	0.000522	(0.000776)	-0.00635	(0.00861)
Ownland	-0.000431	(0.000479)	0.00459	(0.00537)
Landsize	0.00188***	(0.00063)	-0.00022***	(0.00006)
Ownlivestock	0.00122*	(0.000643)	-0.0143**	(0.00702)
HHsize	-0.000251	(0.000176)	0.00308	(0.00197)
Remittance	-0.00157	(0.00108)	0.0187	(0.012)
AssetIndex	-0.000464**	(0.000183)	0.00523***	(0.00194)
LogExpCapita	0.000995***	(0.000341)	-0.0122***	(0.00387)
LogTotalEduexp	-0.00179***	(0.000552)	0.0208***	(0.00582)
DistPrimary	0.000322***	(0.00008)	-0.00357***	(0.000771)
DistJHS	0.000145***	(0.00004)	-0.00157***	(0.000441)
Childwage	0.000165***	(0.00004)	-0.00173***	(0.000452)
Rho	-0.22422	0.03696		
Wald Test, rho=0; chi2(1) Pro		34.344	0.0000	
Log Pseudolikehood			-189731	
Sample			12,891	

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

Furthermore, the employment of the father and mother positively influences children's engagement in hazardous work, but it has a negative association with school participation. Also, the probability of engaging in hazardous work is lesser for children whose fathers or mothers have completed primary school in comparison to children with fathers or mothers who have no education. Similar results were obtained when the sample was restricted to children in rural areas; as well as boys and girls (see appendix tables A5a-A7b).

2.5.2 Hours of Child Work

Table 2.10 and 2.11 present the marginal effects of the tobit estimations of the determinants of the weekly hours of child labour and hazardous work respectively. The first column in all tables shows individual, household and community characteristic variables believed to influence hours of work for the overall sample; while columns 2 and 3 contain the results for boys and girls.

Hours of Child Labour

The result in column 1 shows a significantly negative relationship between school enrolment and the hours of child labour. Child labourers who are enrolled in school work 4.13 hours less than their counterpart who are not in school. School enrolment has larger influence on boys relative to girls, as a boy worker works 4.3 hours less, while a girl worker reduces her hours of work by 4 hours. The negative association between schooling and hours of child labour is collaborated by the negative relationship between hours of class attendance and hours of child labour. This result contradicts earlier study among girls in Bangladesh where increases in enrolment was not associated with appreciable decreases in child labour (Ravallion and Wodon, 2000).

Again, sons and daughters of the household head work more hours than children not related to the head. Relationship to the household head has the largest influence on sons relative to daughters. This result is contrary to other studies that found sons and daughters of the household head working for lesser hours (Ndjanyou and Djienouassi, 2010). Also, possibly due to the definition of child labour used, the findings do not indicate a gender gap in terms of the number of hours worked.

Hours worked by children increases with age at a decreasing rate for the overall sample. However, the results of the split sub-sample show that there is a linear relationship between age and hours of child labour. The implication is that older children work more hours than younger children. This result supports earlier studies on child labourers in Ghana (Bhalotra and Heady, 1998; Owusu and Kwarteng, 2008) that found older children working for more hours than young ones.

Table 2. 10 Correlates of Weekly Hours of Child Labour for Children

	Overall		Boys		Girls	
Independent Variables	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Enrol	-4.12***	(0.287)	-4.247***	(0.411)	-4.013***	(0.399)
ClassAtthrs	-0.02***	(0.0036)	-0.014***	(0.0050)	-0.018***	(0.0053)
Boy	-0.0655	(0.113)	-	-	-	-
RelH	1.430***	(0.273)	1.642***	(0.387)	1.230***	(0.383)
Age	0.682***	(0.118)	0.520***	(0.162)	0.835***	(0.170)
Age2	-0.02***	(0.0052)	-0.0120*	(0.0071)	-0.026***	(0.0075)
FatherEduPrim	-0.0391	(0.279)	-0.238	(0.399)	0.186	(0.391)
FatherEduSec	-0.501**	(0.195)	-0.597**	(0.275)	-0.404	(0.271)
MotherEduPrim	0.486**	(0.215)	0.752***	(0.287)	0.263	(0.305)
MotherEduSec	-0.219	(0.210)	0.128	(0.278)	-0.527*	(0.303)
FatherEmptsta	7.844***	(0.569)	7.383***	(0.737)	8.326***	(0.878)
MotherEmptsta	11.08***	(0.432)	10.68***	(0.613)	11.42***	(0.571)
FatherHH	0.120	(0.325)	0.151	(0.472)	0.116	(0.448)
MotherHH	1.867***	(0.263)	1.604***	(0.358)	2.092***	(0.373)
HeadAge	0.00927	(0.0273)	-0.0528	(0.0380)	0.0716*	(0.0390)
HeadAge2	-0.00004	(0.0002)	0.000523	(0.0004)	-0.000598	(0.0004)
MaleHead	0.679***	(0.218)	0.819***	(0.317)	0.504*	(0.296)
HeadMar	-0.219	(0.153)	-0.277	(0.211)	-0.144	(0.216)
NoChildren	-0.0364	(0.0606)	-0.0151	(0.0826)	-0.0554	(0.0875)
Elders	0.237	(0.180)	0.211	(0.228)	0.249	(0.273)
Ownland	-0.138	(0.121)	-0.241	(0.162)	-0.0173	(0.180)
Landsize	-0.0078*	(0.0041)	-0.00635	(0.0048)	-0.00846	(0.0069)
Ownlivestock	0.216	(0.140)	0.211	(0.199)	0.227	(0.196)
HHsize	0.0771*	(0.0456)	0.0624	(0.0605)	0.0930	(0.0673)
RurUrb	-0.171	(0.146)	-0.376*	(0.202)	0.0113	(0.207)
Remittance	0.0765	(0.224)	-0.0530	(0.280)	0.171	(0.347)
AssetIndex	-0.14***	(0.0351)	-0.144***	(0.0509)	-0.143***	(0.0479)
LogExpCapita	0.445***	(0.0816)	0.381***	(0.114)	0.505***	(0.116)
LogTotalEduexp	1.164***	(0.130)	1.210***	(0.179)	1.111***	(0.188)
Log Pseudo likelihood	-102105		-5225486		-5008046	
Pseudo R2	0.209		0.212		0.207	
Sample	22,326		11,359		10,967	

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

Furthermore, fathers' education level to primary school has no association with hours of child labour in both the pooled sample and sub-samples. However, children with fathers who have completed post-primary school work 0.5 hour less than children whose fathers have no education. Conversely, a mother with only primary school certificate reduces the hours of work of her male children by 0.8 hour, but this has no influence on her daughters' hours of

work. The education level of a mother is associated with the hours of work of her daughters only if it is post-primary school. This finding is in line with earlier works (Ray, 2000; Deb and Rosati, 2002; Bhalotra and Heady, 2003) which show that there is a negative relationship between parent's education and children's working hours. Also, from table 2.10, the employment status of the father and mother has a positive influence on hours of child labour.

In addition, the headship of the household has a weak influence on children's hours of work. Moreover, an increase in the income of the household is associated with a reduction in the number of hours of child labour of 0. 45 hours, with the biggest influence occurring among girls. Also, the household wealth has a negative association with hours of child labour for both boys and girls. This finding is consistent with other studies (Phoumin and Fukui, 2006; Kim and Zepeda, 2004; Bhalotra and Heady, 2003; Bhalotra, 2000) that found an inverse relationship between income or wealth and hours of child labour. A unit increase in schooling expenditure is associated with an increase in the hours of child labour of 1.16 hours.

Lastly, some community variables were included and a separate estimation done for this sub-sample. The results (see table A8 in the appendix) show that distance to the nearest school has a positive association with hours of child labour for the overall sample and boys, but it has no influence on girls' hours of work. Also, higher child wage is associated with more hours of work for both the pooled sample and sub-samples. In terms of the other variables, the results of this sub-sample (rural children only) estimation are in line with the above results in terms of significance of the coefficients (see table A8 in the appendix).

Hours in Hazardous Works

Table 2.11 shows the tobit marginal effects conditioned on working for the pooled sample (column 1), boys only (column 2) and girls only (column 3). The results show that school enrolment has negative association with hours of hazardous work; it reduces hours of work by 4.2 hours for the overall sample. Similar results were obtained for boys and girls with the largest influence occurring among girls.

The actual hours that children spend in schools have no association with their hours of work in hazardous activities. Also, a child who is the son of the household head works 1.9 hours more than a male child worker who is not related to the household head. Moreover, a child's hours of hazardous work increase with girls' age, but age has no association with boys' hours

of hazardous work. Additionally, the education of the father does not affect his children's hours of hazardous work, both for the overall sample and sub-samples. Again, the employment of the father and mother positively influence the hours of hazardous work, with that of the latter having the largest influence.

Table 2. 11 Correlates of Weekly Hours of Hazardous Works for Children

	Overall		Boys		Girls	
Independent Variables	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Enrol	-4.29***	(0.352)	-4.26***	(0.497)	-4.36***	(0.483)
ClassAtthrs	-0.0095*	(0.0055)	-0.0135*	(0.0075)	-0.00407	(0.0081)
Boy	-0.0729	(0.170)	-	-	-	-
RelH	1.449***	(0.426)	1.884***	(0.573)	1.002*	(0.605)
Age	0.422**	(0.174)	0.315	(0.230)	0.527**	(0.255)
Age2	-0.00740	(0.0075)	-0.00147	(0.0099)	-0.0134	(0.0110)
FatherEduPrim	-0.207	(0.404)	-0.739	(0.574)	0.318	(0.559)
FatherEduSec	-0.213	(0.290)	-0.450	(0.420)	-0.0395	(0.391)
MotherEduPrim	0.375	(0.314)	0.984**	(0.387)	-0.157	(0.451)
MotherEduSec	-0.235	(0.314)	0.251	(0.404)	-0.647	(0.459)
FatherEmptsta	6.654***	(0.654)	6.355***	(0.876)	6.964***	(0.959)
MotherEmptsta	9.163***	(0.481)	8.645***	(0.705)	9.568***	(0.613)
FatherHH	0.141	(0.482)	0.313	(0.676)	0.0378	(0.663)
MotherHH	1.319***	(0.385)	0.618	(0.479)	1.958***	(0.570)
HeadAge	-0.0464	(0.0372)	-0.120**	(0.0502)	0.0319	(0.0545)
HeadAge2	0.000436	(0.0003)	0.0011**	(0.0005)	-0.00029	(0.0005)
MaleHead	0.835**	(0.335)	0.898**	(0.452)	0.708	(0.466)
HeadMar	0.296	(0.240)	0.375	(0.332)	0.238	(0.331)
NoChildren	0.138	(0.0886)	0.136	(0.120)	0.134	(0.127)
Elders	0.455*	(0.275)	0.338	(0.349)	0.544	(0.405)
Ownland	-0.58***	(0.180)	-0.88***	(0.249)	-0.258	(0.265)
Landsize	-0.00232	(0.0045)	-0.00481	(0.0065)	0.00163	(0.0086)
Ownlivestock	0.402*	(0.212)	0.443	(0.305)	0.345	(0.289)
HHsize	-0.0856	(0.0698)	-0.0545	(0.0910)	-0.112	(0.103)
RurUrb	0.102	(0.219)	-0.0393	(0.308)	0.216	(0.302)
Remittance	-0.949**	(0.425)	-1.152**	(0.539)	-0.763	(0.648)
AssetIndex	-0.17***	(0.0493)	-0.22***	(0.0699)	-0.124*	(0.0685)
LogExpCapita	-1.05***	(0.121)	-1.15***	(0.171)	-0.95***	(0.169)
LogTotalEduexp	1.373***	(0.191)	1.516***	(0.264)	1.186***	(0.275)
Log Pseudo likelihood	-5146973		-2589170		-2545634	
Pseudo R2	0.153		0.157		0.152	
Sample	22,326		11,359		10,967	

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

Furthermore, male headship of the household has a positive association with the hours of hazardous work for boys, but not for girls. Also, land ownership and receipt of remittance has negative association with the weekly hours of hazardous works for the pooled sample and boys, but not for girls. Similarly, household wealth has no influence on girls' hours of work, but it reduces boys' weekly hours of hazardous work. However, the income of the household has negative association with the weekly hours of hazardous work of the total sample and the sub-samples. Again, schooling cost has positive influence on the weekly hours of hazardous work, with boys working 1.5 hours more in a week when there is a unit increase in schooling expenditure. Again, the inclusion of the community variables and restriction of the sample to rural children did not change the above results (seen in table A9 in the appendix).

2.5.3 Effect of Work on Schooling

Class Attendance

Table 2.12 shows the marginal effects of the tobit estimation of the effect of child labour on weekly hours of class attendance. The significant and negative coefficient of 'LogHoursCL' (log of hours of child labour) show that work has a detrimental effect on class attendance. An additional hour of child labour is associated with a reduction in class attendance of 0.15 hour (that is 9 minutes of class attendance). The effect is higher for girls than boys. One hour of child labour is associated with 0.18 hours decrease in girls' hours of class attendance (about 11 minutes of class attendance) and 0.11 hours for boys (about 7 minutes of class attendance). This result supports other studies such as Khanam and Ross (2011) that found that work has an adverse effect on school enrolment.

Though the aim of this section of the chapter is to examine the association between hours of child labour and class attendance, the results also show some interesting outcomes that merit special consideration. For example, the existence of gender gap in schooling in Ghana and elsewhere has been documented in several studies, including Canagarjah and Coulombe (1998) and Khanam and Ross (2011). However, the results of this study show that the gender of a child has no influence on the hours of class attendance. Also, older children attend school regularly relative to younger ones. Again, a father's educational qualification has no association with his children's weekly hours of class attendance, but mothers' education at the primary level influences class attendance. Also, the father's employment status increases

the hours of class attendance for the combined sample as well as girls, but it has no influence on boys. Likewise, the presence of the father (mother) in the household increases (decreases) the hours of class attendance for girls, but it has no effect on boys.

Table 2. 12 Effects of Hours of Child Labour on School Attendance for Children

	Overall		Boys		Girls	
Independent Variables	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
LogHoursCL	-0.15***	(0.0221)	-0.11***	(0.0295)	-0.177***	(0.0334)
Boy	0.123	(0.239)	-	-	-	-
RelH	-1.025*	(0.538)	-0.678	(0.747)	-1.242	(0.779)
Age	0.659***	(0.224)	0.695**	(0.318)	0.653**	(0.314)
Age2	-0.03***	(0.0105)	-0.034**	(0.0148)	-0.0322**	(0.0147)
FatherEduPrim	0.557	(0.622)	1.202	(0.877)	-0.0238	(0.869)
FatherEduSec	-0.0888	(0.458)	0.0849	(0.628)	-0.171	(0.654)
MotherEduPrim	1.000**	(0.501)	0.789	(0.712)	1.222*	(0.699)
MotherEduSec	-0.852*	(0.487)	-0.285	(0.682)	-1.386**	(0.686)
FatherEmptsta	1.503***	(0.576)	0.663	(0.784)	2.396***	(0.845)
MotherEmptsta	-0.101	(0.544)	0.423	(0.739)	-0.616	(0.801)
FatherHH	1.573**	(0.787)	-0.164	(1.132)	3.237***	(1.091)
MotherHH	-1.75***	(0.656)	-1.219	(0.897)	-2.343**	(0.962)
HeadAge	-0.0317	(0.0596)	0.0403	(0.0857)	-0.105	(0.0829)
HeadAge2	-0.00023	(0.0006)	-0.00076	(0.0008)	0.000309	(0.0008)
MaleHead	-0.171	(0.488)	-0.0353	(0.700)	-0.204	(0.680)
HeadMar	-0.99***	(0.342)	-0.885*	(0.464)	-1.084**	(0.502)
NoChildren	-0.198	(0.147)	-0.384*	(0.200)	-0.00744	(0.212)
Elders	1.136***	(0.400)	0.821	(0.560)	1.487***	(0.569)
Ownland	0.00765	(0.273)	0.0137	(0.388)	-0.0116	(0.383)
Landsize	0.00163	(0.0011)	0.00132	(0.0009)	0.00478	(0.0051)
Ownlivestock	-1.28***	(0.296)	-1.26***	(0.423)	-1.262***	(0.414)
HHsize	0.190*	(0.0994)	0.317**	(0.135)	0.0599	(0.145)
RurUrb	0.803***	(0.310)	0.363	(0.443)	1.304***	(0.431)
Remittance	2.549***	(0.518)	2.45***	(0.703)	2.631***	(0.766)
AssetIndex	-0.00657	(0.0685)	-0.00969	(0.0977)	-0.00670	(0.0955)
LogExpCapita	0.536***	(0.175)	0.413*	(0.250)	0.655***	(0.245)
LogTotalEduexp	-2.14***	(0.284)	-1.51***	(0.402)	-2.153***	(0.401)
TypeSch	-1.39***	(0.315)	-1.73***	(0.449)	-1.077**	(0.441)
Log Pseudo likelihood	-2557152		-1302285		-1254158	
Pseudo R2	0.141		0.146		0.140	
Sample	20,906		10,896		10,210	

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

In terms of household characteristics, the marital status of the head and the household's ownership of livestock negatively influence the weekly hours of class attendance. The presence of elders (persons above 60 years) increases the hours of class attendance for the pooled sample (1.14 hours) and girls (1.49 hours), but it has no influence on boys. Also, the location of the household in an urban area and receipt of remittances are positively associated with children's hours of class attendance. Moreover, household income is positively associated with hours of class attendance though the magnitude of the effect is small. Additionally, schooling variables such as schooling expenditure and attendance of public school have a negative influence on hours of class attendance. Finally, controlling for community variables (table A10, appendix) give similar results to the above analysis, but with few differences.

Educational Attainment-School-for-Age (SAGE)[11]

Table 2.13 shows the marginal effect of the probit estimation of the effect of hours of child labour on educational attainment (SAGE). Column 1 shows the result for the overall sample, while columns 2 and 3 represent the results for boys and girls respectively.

The coefficient of the 'LogHoursCL' variable (log of hours of child labour) is significant and positive. This gives evidence to the fact that work has an adverse influence on a child's grade progression for the overall sample, boys and girls. The result indicates that an additional hour of work increases a working child's probability of falling behind in grade attainment by 1.4 percentage points relative to a non-working child. The influence of hours of work on educational attainment is higher for boys than girls. It increases the probability of a boy falling behind in grade attainment by 1.6 percentage points and for girls the probability increases by 1.2 percentage points. This indicates that work not only reduces the number of hours that children spend in the classroom, but it also reduces their educational attainment in the long term. This result supports other studies on children from Bangladesh (Khanam and Ross, 2011) and children in Ethiopia (Haile and Haile, 2012).

[11] The SAGE value could be reflective of the parents' preferences or it could be the result of some factors that influenced the decision to send the child to school early in the years preceding 2012/13. However, there is no retrospective information in the dataset so the estimate of the association between child labour hours and SAGE could be biased if there were retrospective factors that influenced early or late school entry.

Table 2. 13 Effects of Child Labour on Educational Attainment (SAGE)

	Overall		Boys		Girls	
Independent Variables	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
LogHoursCL	0.0143***	(0.0042)	0.016***	(0.0053)	0.0121*	(0.0065)
Boy	-0.00147	(0.0090)	-	-	-	-
RelH	-0.114***	(0.0152)	-0.09***	(0.0211)	-0.133***	(0.0214)
Age	0.258***	(0.0106)	0.262***	(0.0147)	0.251***	(0.0153)
Age2	-0.008***	(0.0005)	0.008***	(0.0006)	-0.008***	(0.0006)
ClassAtthrs	-0.0012**	(0.0005)	-0.00089	(0.0007)	-0.0015**	(0.0007)
TypeSch	0.0151	(0.0116)	0.0358**	(0.0156)	-0.00539	(0.0170)
Scholarship	-0.0801	(0.0590)	-0.120	(0.0844)	0.0430	(0.0691)
Classmisshrs	0.0020***	(0.0007)	0.00126	(0.0010)	0.003***	(0.0008)
HomeworkhrsS	0.000724	(0.0019)	0.00277	(0.0034)	-0.000797	(0.0023)
FatherEduPrim	0.0795***	(0.0181)	0.076***	(0.0252)	0.088***	(0.0259)
FatherEduSec	-0.00693	(0.0171)	0.00416	(0.0242)	-0.0145	(0.0239)
MotherEduPrim	0.0311**	(0.0143)	0.0428**	(0.0205)	0.0171	(0.0198)
MotherEduSec	-0.053***	(0.0188)	-0.0494*	(0.0267)	-0.0544**	(0.0256)
HeadAge	-0.007***	(0.0023)	-0.01***	(0.0033)	-0.00511	(0.0032)
HeadAge2	0.0064***	(0.0002)	0.001***	(0.0003)	0.00033	(0.0003)
MaleHead	-0.0261*	(0.0149)	-0.0242	(0.0205)	-0.0279	(0.0213)
HeadMar	-0.0113	(0.0124)	-0.00158	(0.0163)	-0.0227	(0.0186)
NoChildren	0.00444	(0.0049)	0.00351	(0.0069)	0.00655	(0.0067)
Elders	0.00330	(0.0159)	-0.0207	(0.0216)	0.0323	(0.0213)
HHsize	-0.00280	(0.0035)	-0.0043	(0.0049)	-0.00157	(0.0048)
RurUrb	-0.0163	(0.0109)	-0.04***	(0.0150)	0.00963	(0.0158)
AssetIndex	-0.011***	(0.0024)	-0.008**	(0.0034)	-0.015***	(0.0034)
LogExpCapita	-0.00356	(0.0064)	-0.0159*	(0.00898)	0.0106	(0.00911)
LogTotalEduexp	-0.00986	(0.0106)	0.0143	(0.0147)	-0.0357**	(0.0153)
Log Pseudo likelihood	-166656		-840742		-816145	
Pseudo R2	0.316		0.324		0.315	
Sample	11,050		5,686		5,364	

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

Similar to the class attendance results, there are other outcomes from these estimations that deserve special attention. For instance, sons and daughters of the household head are less likely to fall behind in grade attainment relative to non-children of the household head. Also, the probability of a child falling behind in grade attainment is positively associated with a child's age but this association becomes negative after a certain age as indicated by the significant and negative coefficient of the age square. In addition, children who attend school more (i.e. have more hours of class attendance) have lower probability of falling behind in grade progression than children who are irregular in school. Furthermore, boys' likelihood of

falling behind in grade attainment is 3.6 percentage points higher if they are enrolled in public schools. Parents' educations have negative association with children's probability of falling behind in school progression only if their educational level is above primary level. These results are consistent with the finding of Ray and Lancaster (2005). Households with older or male heads have a lower probability of their children falling behind in educational attainment, relative to those with young or female heads. This is true for the overall sample and boys, but not for girls. Furthermore, the location of a household in an urban area has negative association with boys' likelihood of falling behind in grade attainment, but it has no influence on girls.

Finally, household wealth has positive association with the educational attainment of children. An increase in the wealth of a household negatively influences the probability of a child falling behind in educational progression. However, the income of the household has no influence on children's educational attainment. The findings on the importance of household wealth are inconsistent with Maitra (2003) and Amin et al. (2006) who found no relationship between educational attainment and income. Also, the results show that schooling expenditure has a positive influence on the educational attainment of girls.

2.6 Conclusion

This chapter sought to identify the main correlates of both extensive and intensive margins of child labour and schooling in Ghana, as well as examine the associated effect of work on children's educational attainment. Believing that the decision to participate in the labour market and/or school is a joint one, the chapter adopted a bivariate probit model in the estimation of the joint decision. Results from this estimation confirm expectations that these choices compete with each other. This chapter classified child work into child labour and hazardous work based on definitions contained in the 1998 Children's Act of Ghana.

The result establishes that there is a gender gap in both child labour and school participation. Boys are more likely to enrol in schools relative to girls. The former is also less likely to participate in the labour market. This reflects cultural values in Ghana that consider boys as more 'valuable' relative to girls. As such, parents place higher values on investment in boys' education relative to that of girls. Also, other child characteristics, such as age and

relationship to the household head, have great influence on the decision to send a child to school or work.

Furthermore, parental education, household wealth and schooling cost are associated with parents' decision to send their children to school or work. Educated parents are more likely to send their children to school instead of sending them to the labour market. Also, children from wealthier households are less likely to participate in child labour and more likely to be enrolled in school. However, the current income of the household does not influence the decision to send a child to work or school. Schooling expenditure and distance to the nearest school have a positive association with child labour participation, but they exert a negative influence on schooling. In rural areas, the wage rate for children in agriculture sector positively influences their participation in the labour market at the expense of schooling.

Additionally, children's participation in hazardous works is influenced by similar factors with the exception of household income, a child's age and education of parents. Though a household's current income has no association with children's participation in child labour, it greatly influences their involvement in hazardous works. The probability of a child engaging in hazardous work decreases with household income. Also, the effect of parent's educational level on hazardous work is higher than its influence on child labour. Again, the likelihood that a child will engage in hazardous works increases at an increasing rate with his/her age. But, in the case of child labour, a child's probability of working increases with age to a point and declines afterwards.

Though mere participation of children in the labour market (whether child labour or hazardous works) is bad, the intensity of the works they do determine the extent to which such works will affect their human capital development. Hence, factors influencing the intensive margin of child labour were also examined. The study found that school enrolment and the hours of class attendance negatively influence the hours of work undertaken by children. The intensity of child labour is also positively associated with a child's age and his relationship with the household head. In terms of parent characteristics, the results show that children work for less hours when their parents have post-primary education.

Additionally, the results on the intensive margin of child labour show that both household wealth and current income negatively influence the hours of child labour undertaken by

children. Thus, poverty is a key correlate of the intensity of works done by children. This is confirmed by the positive association between child wages and hours of child labour among children in rural areas. Furthermore, schooling cost and distance to the nearest school positively influence the intensity of work that children do. In the case of hours of hazardous works, in addition to the above factors, the receipt of remittance and land ownership reduce the number of hours in such works.

In terms of the effect of child labour on education, the results from the estimations show that not only is hours of child labour detrimental to hours of class attendance, but it also increases the probability of a child falling behind in his/her educational attainment. An additional hour of child labour is associated with 0.15 hour (i.e. 9 minutes) reduction in the hours of class attendance. With respect to educational attainment, an extra hour of child labour is associated with 1.43 percentage points increase in the probability of a child falling behind in educational progression. The significant and negative coefficient of the rho (in the bivariate results) and hours of child labour (in the tobit results of class attendance) indicates that work has a detrimental effect on education. Also, the negative association between work and education is confirmed by the significant and positive coefficient of hours of child labour in the education attainment results.

Overall, one important factor that influences both the extensive and intensive margins of child labour and hazardous works from the above results is household income or wealth. Not only is child labour prevalent in poor areas, but, also, there is a negative correlation between child labour participation and household income or wealth. Similarly, children's hours of work is negatively influenced by household income and wealth. In addition, children's agriculture wage exerts a positive effect on child work in rural areas. Thus, children are more likely to work, and for longer hours, when the wage rate is higher. These results support the traditional view that poverty is the main determinant of child labour (Basu and Van, 1998; Beegle et al., 2006; Duryea et al., 2007). Conversely, children tend to be enrolled in school and spend more hours in class when the household's income increases.

The effect of income on child labour and schooling is investigated further in the next chapter (chapter three). The transfer of cash to poor households will not only enable them to afford schooling costs, but it will also enable them to buy nutritious foods for their children, thereby leading to better educational outcomes. In addition, if poverty propels households to send

their children to the labour market, then the transfer of cash to the poor will reduce the opportunity cost of schooling and, hence, reduce child labour. Lastly, an interesting result that came out of the above analysis is the influence of parents' characteristics on both child labour and schooling. It has been argued that parents have different preferences for child products. However, the realisation of an individual's preference depends on the level of bargaining power that he/she has in the household's decision making. Also, though the amount of economic resources available to households are important for child labour and schooling decisions, the bargaining power of each household's member is equally important since it determines resource allocation in the household. Therefore, chapter four of this thesis examines the effect of mothers' bargaining power on child labour and schooling.

CHAPTER 3: Cash Transfer, Schooling and Child Labour: The Case of the Livelihood Empowerment Against Poverty (LEAP) Programme in Ghana

3.1 Introduction

Cash transfer schemes have become important policy tools for poverty alleviation and human capital development in developing countries. These schemes cover about 150 million households in poor countries and benefit around half a billion people (Barrientos and Hulme 2009). Under these schemes, eligible household members who are usually poor are provided with periodic cash payment with conditions that they must adhere to (conditional cash transfer) or without conditions (unconditional cash transfer). Most cash transfer schemes that aim to build the human capital of beneficiaries usually have substantial schooling conditions that ensure that parents send their children to school and, by extension, do not involve them in the labour market (Fiszbein et al., 2009).

Cash transfer schemes are new in Sub-Saharan Africa (SSA) relative to Latin American countries. However, they are spreading rapidly in the sub-region with over 30 countries implementing such schemes in Africa as of 2009 (Miller, 2009). The rapid expansion of cash transfer programmes in Africa may be attributed to the positive results on education and health outcomes achieved by earlier schemes in Latin American countries (Saavedra and Garcia, 2012). However, the question that needs to be answered is whether countries in SSA can use cash transfer programmes to achieve similar positive results in human capital development as observed elsewhere in the literature. This chapter answers this question by examining the impact of a cash transfer scheme on educational outcomes and child labour in Ghana.

Ghana is one of the countries in SSA with relatively high child labour participation rate. According to the most recent Ghana Living Standard Survey Report (2014), 31 percent of children aged 5-17 years are involved in economic activity[12]. In addition, 22 percent of children in the country are child labourers, while 14.2 percent of the country's children are in hazardous works (Ghana Statistical Service, 2014a). In terms of education, Ghana has seen

[12] Not all works performed by children are considered child labour. Child labour includes works harmful to the schooling, health and development of a child.

some improvements, particularly at the primary level, where Gross Enrolment Rate (GER) has increased from 95 percent in 2007/2008 to 110.4 percent in 2014/2015 academic years (Ministry of Education, 2016). In spite of these achievements in the educational sector, the country has relatively lower Net Enrolment Rates, higher repetition rate and lower test scores (Ministry of Education, 2016; Education Assessment Report, 2016).

One of the main factors linked to child labour and lower school outcomes in Ghana is poverty (Canagarajah and Nielsen, 2001; Blunch and Verner, 2000; Ray, 2000; Osei et al., 2009). In recognition of this, the country introduced a cash transfer scheme called Livelihood Empowerment Against Poverty (LEAP) programme in 2008, where child labour participation rates are considered in the selection of beneficiary communities. Also, beneficiary households are expected to adhere to certain behavioural changes[13] including sending their children to school and elimination of the worst form of child labour. Provision of cash to poor households augments their incomes and enables them to afford schooling expenditure; hence, it may reduce child labour and increase schooling as evident in certain Latin American countries. However, as noted by Kakwani et al. (2005), the success of Conditional Cash Transfer (CCT) programmes in Latin American countries does not guarantee their success in other countries.

This chapter examines the success of a cash transfer programme with respect to human capital development in Ghana. Specifically, it seeks to answer the following questions: Does the transfer of cash to the poor improve educational outcomes? Will the transfer reduce child labour? Also, what is the effect of this cash transfer on children who are already in the labour market and/or enrolled in schools? And, does this transfer impact on short term educational outcomes such as repetition and test scores? Finally, is there substantial heterogeneity in the effects of this scheme?

Although, numerous evaluation studies have been carried out on CCT programmes, most of them are found in Latin American countries with limited research in SSA. Considering the rapid expansion of CCT programmes in SSA, there is the need for vigorous evaluation studies on these schemes to ascertain their effectiveness in achieving their goals. In addition, drawing primarily from experience in Latin America, existing studies (Parker and Skoufias,

[13] These apply to certain beneficiaries as discussed in section 3.

2000; Maluccio and Flores, 2004; Olinto and de Souza, 2005) usually examine the impact of cash transfer schemes on whether children participate in the labour market or not (extensive margin of child labour). These studies often fail to investigate the extent to which these schemes impact on the duration (intensive margin) of child work (Gee, 2010). This chapter, therefore, contributes to the literature by providing evidence on the effectiveness of CCT programmes in reducing the intensity of work done by child labourers.

Furthermore, there is limited studies on CCT and other educational outcomes such as test scores (Ponce and Bedi, 2008) as most studies on CCT and schooling have concentrated on school enrolment and attendance. While enrolment and attendance are the first steps required to ensure a higher level of educational attainment and achievement, focusing on such indicators may not be enough to capture the human capital development aspect of such programmes. This is particularly the case in SSA where majority of the child labourers combine work and school; though such children are more likely to leave school early (Basu and Van, 1998). In addition, for CCT programmes with schooling conditions, parents may enrol their children in school just to meet these conditions and send the children to the labour market after school. Therefore, it is important to examine whether such programmes also impact positively on educational outcomes such as repetition and test scores (cognitive ability).

In addition, this study will assist policy makers to improve upon the design of the LEAP scheme for expansion. Ghana's LEAP programme, like most cash transfer programmes in SSA countries, is currently being implemented in only 185 districts out of 216 districts in the country; and scaling up of the programme to other districts is on-going. This study will enable policy makers to know whether the programme is achieving its objective or not. One of the goals of the LEAP programme is human capital development of beneficiaries. The scheme's impact on educational outcomes and child labour are very important for the attainment of this goal.

The empirical analysis in this chapter is based on a longitudinal LEAP dataset collected by the Institute of Statistical, Social and Economic Research (ISSER) of University of Ghana and University of North Carolina, with support from Yale University. This data is non-experimental, so in order to overcome the problem of a counterfactual group and attribute changes in child welfare outcomes to the LEAP programme alone, three alternative quasi-

experimental methods are used in this chapter. In particular, propensity score matching (PSM), difference-in-difference (DD) and difference-in difference combined with matching (MDD) estimation techniques are used. However, discussion of the results is based on the MDD estimation method since it is best among these three. This is because the matching procedure provide a better 'control' group that are similar to the LEAP recipients in their observable traits, while the difference-in-difference method addresses differences in unobservable characteristics. This approach makes it possible to control for bias resulting from both observable and unobservable factors associated with the selection of participants into the LEAP programme.

In addition, the chapter examines heterogeneity in the effects of the LEAP programme by splitting the sample into various groups. Theoretical models and empirical findings seem to suggest that children tend to benefit more when resources are in the hand of their mothers relative to their fathers (Basu, 2006; Doss, 1996). Hence, for the impact of the LEAP on child labour in farming, the sample is split into two groups based on the gender of the household head. The LEAP programme is targeted at the poor. However, some of these households are poorer than others. Hence, the sample is divided into two income groups (extremely poor and non-extremely poor households) to access the impact of the LEAP on child labour among different income groups of beneficiaries. In terms of the effect of the scheme on educational outcomes, the sample is disaggregated by the gender and age of the children.

The results show that the LEAP programme had no effect on school enrolment rates in the overall sample and all subsamples except boys and older children aged 13-17 years. The programme has a positive impact on school enrolment rate of boys and older children. Furthermore, the LEAP programme increased weekly hours of class attendance and reduced repetition rates among children aged 5-17 years. Again, the study finds no effect on test scores (cognitive achievement). In terms of child labour in farming, the results show that the LEAP programme has no impact on extensive margin of child labour (that is participation in farming activities) for the overall sample and all sub-samples except in female headed households. However, for working children, the LEAP reduced their working hours in farming in the overall sample and all sub-samples, except children in non-extremely poor households. Lastly, for child labour in non-farm enterprises, there is no significant difference in the probability of participation in child labour or hours of work among children in

households that benefited from the LEAP programme and their counterparts in the control group.

The rest of this chapter is organised as follows. This introduction section is followed by a review of the literature on CCT, educational outcomes and child labour in section two. Section three presents a detail description of the LEAP programme in Ghana. This is followed by the empirical methodology in section four. Analysis of the results follows in section five; and section six concludes the chapter with a summary and policy recommendations.

3.2 Literature Review

This section reviews various empirical studies on the impacts of CCT programmes on educational outcomes and child labour. It begins with a review of the theoretical channels through which CCT programmes may affect education and child labour.

Theoretical Review

Theoretically, the impact of a cash transfer scheme on investment in human capital can be analysed through its income and substitution effects (Kabeer et al., 2012). Considering schooling as a normal good, the income effect implies that the increase in household's income due to the cash transfer increases the demand for schooling. Thus, cash transfer may enable poor households that could not invest in their children's education previously due to poverty and/or credit constraints to do so. By the income effect, households are able to pay for school expenses and provide their children with school materials, which may lead to increase in school participation. On the other hand, cash transfer reduces the opportunity cost of schooling (that is the income from child labour). This result in a shift from labour market participation to schooling and this is known as the substitution effect. With the substitution effect, cash transfer reduces households' valuation of the income from child labour and, as such, they may substitute child labour for schooling.

In the case of conditional cash transfer, there is another form of substitution effect with respect to investment in human capital. This occurs because of the imposition of conditions. The attachment of conditions to these transfers increases the opportunity costs of failing to

adhere to the conditions and losing the transfer. Hence, beneficiaries substitute other investment spending for investment in human capital. The magnitude of the effect of CCTs on school participation (enrolment and attendance), therefore, is the net result of the income and substitution effects of the transfer. Hence, the relationship between CCT and school participation is expected to be positive (Fiszbein and Schady, 2009). However, the effect of CCT on child labour is not straightforward, since an increase in school participation may not translate into reduction in child labour. This is particularly the case in most SSA countries where most child labourers combine work with school. As noted by De Hoop and Rosati (2013), cash transfer can have an ambiguous effect on child labour theoretically as the cash transfer may empower poor households who were unemployed previously to engage in businesses which may require the use of child labourers.

The impact of CCT programmes on students' educational performance (that is repetition rate and test scores) is also ambiguous theoretically. This is because there are several channels through which CCT can affect educational performance. On one hand, CCT programmes may exert a positive impact on educational performance because they increase school attendance; and this is likely to lead to higher test scores (Bedi and Marshall, 1999 and 2002). In addition, CCT programmes may increase the consumption of nutritious food and school supply (Baez and Camacho, 2011). Better nutrition and provision of school supply may in turn translate into better educational performance (Ponce and Bedi, 2008). Also, CCT programmes may result in reduction in child labour (Rawlings and Rubio, 2003; Caldés et al., 2006; Villatoro, 2005). This may in turn exert a positive effect on educational performance (that is reduction in repetition and increase in test score).

On the other hand, a CCT programme may have adverse effects on educational performance. Increases in school enrolment as a result of the CCT programme may translate into congested classrooms, which in turn may negatively affect education performance given a constant supply of schooling inputs (Ponce and Bedi, 2008). In addition, children from poor households that are brought into the educational system by the programme may have lower expected returns from schooling than those already in schools. With lower expected returns from schooling, this group will learn less; and this may reduce the average educational performance (Filmer and Schady, 2009). Hence, theoretically, the impact of CCT on test scores and repetition is not straightforward. Whether the positive aspects of CCT

programmes will outweigh the negative effects due to the same schemes is an empirical question.

Review of Empirical Studies

There are numerous studies on the impacts of CCTs on school enrolment and to a lesser extent school attendance, especially in Latin American countries. As stated earlier, most studies focus on the casual effect of CCT programmes on school enrolment as measured by whether the child is registered in school or not. Only a few studies examine school attendance, which is the number of hours in a day, or days in a week, that the child goes to school. Reviews of empirical literature on CCT and education programmes show that, on the whole, CCT may impact positively on school participation (IEG, 2011; Fiszbein and Schady, 2009; Rawlings and Rubio, 2005). However, these reviews also indicate that there is substantial variation in the size of the effect of CCT programmes on schooling among countries; and among different groups within countries (Saavedra and Garcia, 2012).

One of the earliest CCT programme is the Mexican Progresa (now called Oportunidades). This programme has been studied widely. Parker and Skoufias (2000) evaluated this programme using a cluster randomised method and found that the offer of a *Progresa* subsidy lowered by approximately 3.1 percentage points the probability that boys aged 8-17 will work; and for girls of the same age range, their likelihood of working is reduced by 1.2 percentage points. However, the programme had no effect on the children who were already working. Behrman, Parker and Todd (2011) examine the long run impact of this same Oportunidades and discuss whether these estimates differ from the short run estimates (i.e. whether the impact of the programme changes over time). Their propensity score estimates suggest that the probability that boys who were 14-16 years old in 2003 (5.5 years after the programme was first implemented) work is 14 percentage points lower in Oportunidades villages than in communities that had never benefited from the scheme. They found no evidence that work participation changed for girls in this age group. The reduction in work by boys in the long run is stronger than the modest impact in the short run found by Skoufias and Parker (2000). This suggests that the beneficial impact of the Mexican conditional cash transfer programme is compounded over time.

In terms of the impact of the Mexican Progresa on schooling, numerous studies have been carried out. For instance, Behrman et al. (2010) study the short-term effects of this scheme on urban children with the Urban Evaluation Survey, which is longitudinal in nature. The baseline data was gathered in the fall of 2002 prior to beneficiary households receiving the programme's benefits. Two rounds of surveys were conducted post-programme initiation in 2003 and 2004. In all rounds, data were gathered on households living in both intervention and non-intervention areas. They employed a difference-in-difference method combined with the propensity score matching method for their estimation. The results show a statistically significant positive effect of the programme on school enrolment, school attainment, time devoted to homework and the probability that parents assist their children with homework.

Behrman et al.'s (2010) results were confirmed by Dubios et al. (2012) on the same Mexican Progresa (Oportunidades). However, in addition to school enrolment, Dubios et al. (2012) also examined the effect of the programme on performance in passing grades. They used a randomized experiment implemented under the Progresa programme to collect data for the study. The data consists of a sample of 506 communities (with 320 and 186 communities in treatment and control group respectively) interviewed in 1997 and 1998.They found that the programme had a positive impact on school enrolment at all grade levels. However, in terms of school performance, it had a positive impact at the primary school level, but a negative impact at the secondary level. The authors suggested that the negative impact of the programme on school performance at the secondary level may be due to the disincentives created by termination of the programme's benefits after the third year of secondary school.

Brazil is also one of the pioneers of CCT programmes in Latin America. It implemented two main schemes – the Programa de Erradicacao de Trabalho Infantil (PETI) and Bolsa Escola. These two programmes are similar as they provide cash transfers to households conditioned on school participation. Yap et al. (2002) investigated the impact of the PETI programme on schooling, labour market participation, hours worked, academic progress and dangerous work. They relied on experimental design for the data collection in 1999 among six communities. Three of these municipalities were in the PETI programme, while the remaining three municipalities have similar socioeconomic status as the former, but were not in the PETI programme and served as a control group. In all, 2,864 households with 5,611 children aged 7-14 years were drawn randomly for the analysis. Their results show that the PETI programme increased hours in school by 11-17 hours. In addition, the PETI programme

had a positive and significant effect on grade-for-age for participating children in all three states. In terms of child labour, the probability of working dropped by 5-18 percentage points in the three treated communities; while the probability of working at least 10 hours reduced by 5-9 percentage points for children in the programme. These results were confirmed by Pianto and Soares (2003) on the same PETI scheme.

With respect to Brazil's 'Bolsa Escola' programme, various studies have examined the effect of the programme on human capital development indicators such as schooling outcomes and child labour. One of such studies was conducted by Cardoso and Souza in 2004. Using household level data from the 2000 Census, they adopted PSM estimation. After using this method to balance the observed covariates between the treatment group and a comparison group, they find that the programme had no significant effect on child labour, but a positive and significant impact on school attendance. The authors attributed this result to the fact that households may prefer their children to combine school and work since the transfers are too small to serve as an incentive for them to forgo working.

In addition to Mexico and Brazil, CCT programmes in other Latin American countries have also been studied. For instance, the Costa Rica's Superémonos was studied by Duryea and Morrison (2004). Superémonos is a conditional transfer programme that provides poor families with a subsidy for the purchase of food conditional on regular school attendance by children. They used a survey conducted in 2001 which consists of 746 participating families and 1,042 non-participating families to analyse the effect of the scheme on child labour, school attendance and school performance. They adopted the 'propensity score matching' technique to compare the outcomes of the programme between participants and non-participants. The results showed that the Superémonos programme has a statistically significant impact on school attendance in 2001, with an increase in the probability of school participation of five percentage points. However, there were no significant effects on the probability of passing a grade and working. For the 2002 school year, there was 8.7 percent statistically significant increase in the probability of attending school, but no impact on the probability of working in the week prior to the survey.

Also, Maluccio and Flore (2004) studied the Nicaraguan's *Red de Protección Social* (RPS), which aims at supplementing households' income to increase household expenditures on food, reduce primary school desertion, and improve the health care and nutritional status of

children under age five. Their study was based on a randomisation of this community-based intervention with measurements before and after the intervention. The data collected for the evaluation were from an annual household panel data survey implemented in both intervention and control areas of RPS before the start of the programme in 2000; and in 2001 and 2002 after implementation of the programme. In all, 42 households were randomly selected in each *comarca* (region) using a census carried out by RPS with a sample of 1,764 households. They found that the RPS induced a significant average net increase in school enrolment of 17.7 percentage points for the target population of children aged 7-13 years who had not yet completed the fourth grade of primary school. In addition, it resulted in 23 percentage points increase in hours of school attendance for children of the same age group. Also, overall, the programme had significant improvement in the average retention rate or continuation rate of 6.5 percent. Finally, the result showed that the percentage of children working was lower after the implementation of the programme, though the difference between the participants and non-participants was not statistically significant.

Furthermore, Filmer and Schady (2009) analysed the effects of a CCT programme in Cambodia, known as the CESSP Scholarship Programme (CSP), which gives scholarships to poor children for the three years of the lower secondary school cycle. The main data for this study came from a household survey of 3,225 randomly selected applicants out of 26,537 scholarship applicants. The data was collected approximately 18 months after the children filled out the application forms (that is in 2006). Using the regression discontinuity (RD) estimation method, the paper estimates the impact of the CSP on school enrolment and attendance, as well as test scores. The results show that the programme had a large effect on school enrolment and attendance, which increased by approximately 25 percentage points. However, there was no evidence that, 18 months after the scholarships were awarded, the recipient children did any better on mathematics and vocabulary tests, than they would have in the absence of the programme. They suggested that the CSP programme had no effect on test scores because of 'self-selection' into schools based on expected gains. Thus, the children brought into schools by the CSP programme may be drawn disproportionately from the left-hand side of the ability distribution (that is low ability children). This could limit the extent to which additional schooling translates into more learning and better test scores.

In Africa, one of the earliest cash transfer schemes is South Africa's Child Support Grant (CSG). This was evaluated by UNICEF (2012) with non-experimental approaches since there

is no practical or legal scope for random allocation of grants in South Africa. Using propensity score matching, the study examined how duration in the CSG programme affects grade attainment, scores on mathematical ability tests and scores on reading and vocabulary tests for children who were 10 years old at the time of the survey. The results indicated that children who were enrolled in the CSG at birth completed significantly more grades of schooling than children who were enrolled at age six. Also, the receipt of the CSG by the household reduced adolescent absences from school, particularly for male adolescents. In addition, early receipt of the CSG (in the first seven years of life) reduced the likelihood that children will grow up into adolescents who will work outside the home particularly girls.

Ward et al. (2010) studied the impact of Kenya's Cash Transfer for Orphans and Vulnerable Children (CT-OVC) programme on various indicators including schooling. Baseline and follow-up surveys were conducted in 2007 and 2009 in two locations that were randomly selected to benefit from the intervention, and two locations selected to act as controls. In all, a total of 2,255 households were interviewed at baseline and again at follow-up. The authors did not find evidence of increased enrolment or attendance in basic schools, but the programme increased enrolment among the youngest children. In addition, the programme had a positive impact on secondary school enrolment in older children, with an increase of six to seven percentage points in treated areas relative to the control areas. Using the same dataset, De Hoop et al. (2014) examined the impact of this scheme on children's activities. They found that the programme did not have a statistically significant effect on school participation of children from beneficiary households, but it lowered these children's participation in work for pay and work without pay (household chores). This finding contrasts with Ward et al.'s (2010) study, which found increases in school participation as a result of Kenya's programme. Asfaw et al. (2012) also used difference-in-difference method and found that Kenya's cash transfer programme had no impact on children's involvement in wage employment, but it reduced boys' (age 10-15 years) work on family farms.

Malawi launched its Mchinji Social Cash Transfer in 2006 as a major poverty reduction tool in the country's National Social Protection Policy. Miller et al. (2008) examined the impact of this programme on households and individual welfare indicators including education and work. Data collection for this study occurred between March 2007 and April 2008. It consisted of three rounds of data collection (that is at baseline in March 2007, mid-term in September 2007 and final one in April 2008) on intervention and control households. In all,

about 819 households were surveyed for the study from eight Village Development Communities (that is 408 recipients and 411 non-recipients households). The results showed that children in the intervention households experienced improvements in school enrolment and class attendance, as well as, increased in schooling expenditure; but the scheme had no effect on the number of days that children were absent from school in the month prior to the survey. In terms of child work, fewer intervention children did chores or caregiving at someone else's home versus comparison children; but more intervention children did other family work, such as selling goods. Also, other studies on this programme gave evidence of reduction in child labour outside the household, but an increase in children involvement in tasks within the household (Covarrubias et al., 2012).

In recent years, there has been a rise in studies on various pilot cash transfer schemes in SSA. These include studies on Zambia, Tanzania and Lesotho. In Zambia, the government began an implementation of a Child Grant Programme (CGP) in three districts (in Kaputa, Kalabo, and Shangombo) in 2010; and contracted the American Institutes for Research (AIR) to evaluate the programme in 2014. Using a Randomized Control Trial (RCT), the survey includes 2,421 households in 90 Community Welfare Assistance Committees (CWACs) that were randomly assigned to treatment or control groups. These households were interviewed in 2010 and follow-up data collection occurred in 2014 (that is 48 months after the baseline survey). Overall, the results after 4 years of the programme show that the programme had no impacts on school enrolment and attendance of children in the age groups 4–7, 8–10 and 15–17 years. However, it increased school enrolment of children 11–14 years by 5.6 percentage points. In terms of child labour, the programme had no effect on both children's participation in the labour market and number of hours they spend in unpaid/paid works (American Institutes for Research, 2015).

Furthermore, Evans et al. (2014) studied a community based Conditional Cash Transfers in Tanzania based on randomised trial. This programme provides a cash stipend to households conditional on them satisfying basic conditions, including health clinic visits for children age 0-5 and for elderly age 60 and over; and school enrolment and attendance for children age 7-15. The data collection involved randomisation of 80 communities into treatment and control groups. A household survey was carried out at baseline (in late 2009) and midline (in mid-2011) among households in both groups. The overall dataset included information from 1,764 households (6,924 individuals) surveyed at the baseline and 1,758 households (7.036

individuals) surveyed at the midline (at mid-2011). They found that the programme improved literacy, school enrolment, and grade progression, although it did not improve the frequency of school attendance.

Lastly, Pellerano et al. (2014) evaluated Lesotho's Child Grant Programme (CGP). The CGP is an unconditional social cash transfer targeted at poor and vulnerable households. The programme provides a regular quarterly transfer to poor households whose children are selected through a combination of Proxy Means Testing (PMT) and community validation. The main data for the study is a longitudinal data collected in 2011 and 2013 among a representative sample of CGP recipients (treatment group) with a control group (that is similar households and children who do not benefit from the programme). Using Difference-in-Differences estimation strategy, their results indicate that the programme had a positive effect on children's enrolment in school of about 5 percentage points. Also, the CGP positively contributed to retention of children aged 13-17 years in primary school, particularly boys who would have otherwise dropped out. However, the programme did not have any noticeable impact on other important dimensions of school progression, such as early enrolment, repetition, primary school completion and enrolment in secondary.

The above empirical studies show that though Cash Transfer affects both the incidence (participation decision) and duration (hours work) of child labour, most studies focus on child labour participation. Examining the effects of cash transfers on participation in the labour market alone may not give an accurate result of the impacts of such schemes in Ghana, since most child labourers combine work and school (Canagarajah and Coulombe, 1998). Thus, children may not stop working because of the cash transfer, but rather they may work for fewer hours as the households can now afford to hire outside labourers. Also, no study has examined the impact of Ghana's LEAP programme on child labour to the best of my knowledge. However, with respect to the impact of the LEAP programme on schooling outcomes, this paper is to some extent similar to de Groot et al (2015). These authors examined that impact of the LEAP programme on school enrolment and missed school days. This paper extends the literature on the impact of LEAP on schooling outcomes by examining the scheme's effect on hours of class attendance, repetition and test scores in addition to

enrolment[14]. In addition, there is little evidence on the impact of CCT on school performance and the development of children's cognitive abilities (Fiszbein and Schady, 2009). Though few studies have examined CCT programmes' impact on tests administered at school, such studies may suffer from selection bias, since the programmes may lead to the enrolment of lower ability children who were not in school initially. Due to the selection bias associated with school-based test, this chapter examines the impacts of the LEAP programme on a home-based test.

3.3. Livelihood Empowerment Against Poverty (LEAP) Programme

The Livelihood Empowerment Against Poverty (LEAP) programme is part of Ghana's National Social Protection Strategy (NSPS). Though the incidence of extreme poverty in Ghana has been halved from 16.5 percent (2005/06) to 8.4 peercent (2012/13), the country still faces high income inequality with a Gini-coefficient of 42.3 percent in 2013 (GSS, 2013). This high income inequality necessitated the formulation of the National Social Protection Strategy (NSPS). The NSPS facilitates the provision of the various social protection interventions, with the aim of protecting the right of the extremely poor and vulnerable, thereby ensuring that they have decent lives. The aims of the LEAP programme are alleviation of short-term poverty and the development of the human capital of beneficiary members in the long term. The programme was piloted in late 2008 with about 1,654 households in 21 districts and it was expanded in both 2009 and 2010. As of 2015 there were 522,000 beneficiaries from 4,074 communities in 116 districts (Ministry of Gender, Children and Social Protection, 2016).

Selection of LEAP Beneficiary Households

The LEAP programme is targeted at households that fall below a specific poverty line[15] and, in addition, have a member who fall into one of these three main demographic characteristics: a single parent with orphans and vulnerable child (OVC); a poor elderly person (over 65 years); or someone with severe disability. Selections of households followed three processes. The first process involves the selection of the poorest districts using poverty indicators in the various districts. The selected districts then form District LEAP Implementation committees (DLICs), who then select communities from the districts to benefit from the LEAP. The

[14] While this paper defines enrolment as dummy variable which is 1 if a child was enrolled in school in the previous year and he/she is still in school, and 0 otherwise; De Groot et al, (2015) defined enrolment as 1 if a child is currently enrolled in school and 0 otherwise.

[15] They use the extreme poverty line existing in the country at the time of selection into the LEAP scheme.

selection of the communities takes into account the prevalence of health conditions (such as the incidence of guinea worm, buruli ulcer and HIV/AIDS), National Health Insurance Scheme (NHIS) registration level, availability and access to quality social services, prevalence of child labour and child trafficking as well as the geographical isolation of the community. However, there is no consistent weighting of these factors in the selection process.

Community LEAP Implementation Committees (CLICs) are then formed in the selected communities to identify eligible households based on the three criteria. The selected beneficiaries and methodology for the selection of beneficiary households are then presented by the CLIC to the community members so that they can make suggestions on the inclusion or exclusion of certain households. The eligibility criteria for selection of beneficiaries are clearly stated in the LEAP operational manual and these criteria must be explained to recipients; however, it has been found that they are not well communicated to the beneficiaries (Park et al., 2012).

Benefits Under the LEAP Programme

Beneficiary members of the selected households are registered freely on the National Health Insurance Scheme. In addition, beneficiary households received a monthly cash transfer which ranged between GH¢8 and GH¢15 ($5.7-$10.7)[16] in 2010. This was increased to GH¢24 and GH¢45 (US$13.3 – US$25)[17] in 2012; but the exact amount receive by a household depends on the number of household members that fall into the three demographic characteristics specified above. As of 2015[18], a household with one, two, three and four or more members that fall in any of the three demographic characteristics get GH¢64 ($16.8), GH¢76($20), GH¢88($23.2) and GH¢106($27.9) respectively. The cash increment over time may be partly due to conclusion reached by some studies that the amount is too small (Daidone and Davis, 2013).

Conditions of the LEAP Programme

The LEAP programme is unconditional for elderly persons over 65 years and persons with extreme disability, though continuous receipt of the cash depends on having a health

[16] Using the exchange rate of GH¢1.4to US$1 as at 31/12/2010 from Bank of Ghana
[17] Using the exchange rate of GH¢2 to US$1 as at 31/12/2012 from Bank of Ghana
[18] Using the exchange rate of GH¢3.8 to US$1 as at 31/10/2015 from Bank of Ghana

insurance card (Handa et al., 2014). However, for single parents who take care of orphans and vulnerable children, they must adhere to these behavioural conditions:

- Enrolment and retention of all school age children in school
- Birth registration of new-born babies and their attendance at postnatal clinics
- Full vaccination of children up to the age of five
- Non-trafficking of children and their non-participation in the worst forms of child labour

The CLIC is responsible for the monitoring of households to ensure that they adhere to these conditions. However, the effectiveness of this monitoring is in doubt, since some of the beneficiaries are also part of the CLIC (Daidone and Davis, 2013). Also, most of the beneficiaries are not even aware of the existence of these conditions (Park et al., 2012).

3.4. Methodology

3.4.1 Data

This study uses the LEAP programme evaluation dataset which was collected by the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana in collaboration with the University of North Carolina, Chapel Hill. Baseline information on 699 future LEAP beneficiary households from the Brong-Ahafo, Central and Volta regions of Ghana were collected as part of a nation-wide representative household survey conducted in 2010. This nation-wide survey consists of 5,009 households (excluding the 699 future LEAP beneficiaries); 3,136 of these households were located in rural areas with the remaining found in the urban centres.

From these 3,136 rural households, those located in districts and communities close to the future LEAP beneficiary households were selected as 'potential' control group. This selection process involved the dropping of households from the Upper East, Upper West and the Northern regions. A total of 914 households were selected as control group[19]. Hence, the

[19] The selection of the control group at baseline year was done using PSM and it consisted of 699 households but 215 households were added to this group to increase the sample (for the control group to be 914 (699+215)) and the statistical power. The loss of households during the follow-up survey and the addition of the 215 households may have resulted in the statistically significant differences between the treated (LEAP) and control (Non-LEAP) groups, hence the uses of matching combined with difference-in-difference estimation strategy in

baseline data (the survey in 2010) consists of 699 future LEAP beneficiaries (treatment group) and 914 Non-LEAP households (control group). A follow up survey was conducted among the LEAP beneficiaries and the control households two years after the implementation of the programme (in 2012). In all, a total of 1,504 of these households were re-interviewed with an attrition rate of about eight percent. Hence, the panel data for this study consists of 646 treated and 858 control households (excluding attrition). Table 3.1 shows the sample distribution of the data for this study.

From table 3.1, a total of 2,139 children (persons less than 18 years) were interviewed in 2010. This comprises of 935 and 1,204 children from LEAP and Non-LEAP households respectively. The number of children interviewed two years after the implementation of the LEAP programme was 1,945, with 869 and 1076 from LEAP and Non-LEAP households respectively. With respect to child labour in farming, the focus is on households that farmed. From table 3.1, out of the total household interviewed in 2010, 946 of them farmed in that period and this increased to 953 households in 2012. Also, the sample size for examining the effect of the LEAP programme on child labour in non-farm enterprises consists of children in households with such enterprises. There were 769 and 684 children in these households in 2010 and 2012 respectively.

Table 3. 1 Sample Size of the LEAP Data

	Baseline (2010)			Post-LEAP (2012)		
	LEAP	**Non-LEAP**	**Total**	**LEAP**	**Non-LEAP**	**Total**
Households	646	858	1,504	646	858	1,504
Children (5-17 Years)	935	1204	2,139	869	1076	1,945
Farming Households	604	342	946	629	324	953
Households with Non-farm Enterprises	256	190	446	291	192	484
Children in households with non-farm business	426	343	769	383	301	684

this paper. Attrition in the sample was not systematic and it has been found to have no effect on the internal validity of the results (Handa et al., 2014).

3.4.2 Descriptive Statistics

This section looks at the descriptive statistics of the overall sample, followed by characteristics of farming households, as well as summary statistics of households with non-farm enterprises.

Households and Children Characteristics

Table 3.2 presents the descriptive statistics of our sample (LEAP and Non-LEAP households). Table 3.2 shows that households' heads in the LEAP group are different from those in Non-LEAP group. This is evident by the statistically significant difference in all the baseline (pre-LEAP) characteristics of the households' heads (age, sex, marital status, and years of schooling) of the two groups. The average age of a household head is 56 years and 60 years respectively for Non-LEAP and LEAP households. In addition, approximately 50 percent of Non-LEAP and 41 percent of LEAP households are headed by men. In terms of marital status, whereas married Non-LEAP households' heads constitute 44 percent, roughly 37 percent of LEAP households' heads were married. Lastly, household heads belonging to the Non-LEAP category has more years of schooling (approximately 4years) relative to LEAP households heads (approximately 2years). The trend is not different for post-LEAP period.

In terms of household demographics, statistically there is a difference only in the presence of orphans and widows in the household between Non-LEAP and LEAP groups at baseline. The percentage of households with orphans increased in both Non-LEAP (3 percent) and LEAP groups (44 percent) in 2012. In addition, whereas the proportion of Non-LEAP and LEAP households with widows were approximately 31 percent and 51 percent respectively at baseline, it increased to 33 percent and 55 percent respectively during the follow up in 2012. The high proportion of LEAP households with orphans is not surprisingly since the presence of an orphan in a household is one of the eligibility criteria for selection into the LEAP programme. Furthermore, for both periods (2010 and 2012), there are four members in a household on average for both Non-LEAP and LEAP households, with the average number of children being three per household.

Table 3. 2 Mean Characteristics of LEAP and Non-LEAP Households

	Baseline (2010)			Post-LEAP (2012)		
	NON-LEAP	LEAP	Diff	NON-LEAP	LEAP	Diff
Head Characteristics						
Head Age	56.46	60.14	-3.66**	57.92	62.68	-4.76**
	(0.620)	(0.751)	(0.967)	(0.624)	(0.767)	(0.980)
Male Head	0.495	0.413	0.082**	0.477	0.395	0.082**
	(0.017)	(0.019)	(0.026)	(0.017)	(0.019)	(0.026)
Head Marital Status	0.440	0.374	0.066**	0.451	0.345	0.106**
	(0.017)	(0.019)	(0.026)	(0.017)	(0.019)	(0.026)
Years of Schooling	4.389	2.286	2.103**	4.381	2.649	1.732**
	(0.170)	(0.157)	(0.238)	(0.172)	(0.173)	(0.248)
Demographics						
Household Size	3.828	3.938	-0.110	4.266	4.490	-0.224
	(0.083)	(0.099)	(0.128)	(0.089)	(0.108)	(0.1386)
Number of Children	2.730	2.844	-0.114	2.497	2.551	-0.054
	(0.068)	(0.081)	(0.106)	(0.066)	(0.078)	(0.1017)
Presence of Elders (60+)	0.596	0.841	-0.24**	1.092	1.447	-0.355**
	(0.023)	(0.027)	(0.036)	(0.037)	(0.048)	(0.060)
Presence of Orphans	0.019	0.248	-0.23**	0.030	0.44	-0.41**
	(0.005)	(0.017)	(0.016)	(0.005)	(0.010)	(0.010)
Presence of Widows	0.312	0.506	-0.20**	0.326	0.552	-0.226**
	(0.016)	(0.020)	(0.025)	(0.016)	(0.020)	(0.025)

Standard errors in parentheses and ** means the difference is significant at 5%

With respect to other household characteristics, table 3.3 shows that there is a statistically significant difference between the baseline per capita expenditure for Non-LEAP households (GH¢588) and LEAP households (GH¢477). During the follow up in 2012, per capita expenditure for Non-LEAP households (GH¢728) is significantly more than per capita expenditure for LEAP households (GH¢580)[20]. There is also a statistically significant difference between the two groups in terms of land ownership with 69 percent and 52 percent of Non-LEAP and LEAP households owning lands respectively at baseline. However, in 2012 (post-LEAP), whereas the proportion of Non-LEAP households owning land significantly increased to 73 percent, only 50 percent of LEAP households own land.

The average land size for both groups is about 3 acres in both baseline and follow up periods. Additionally, 41 percent and 18 percent of Non-LEAP and LEAP households received remittances in 2010; however, remittance receipt decreased to 31 percent for Non-LEAP

[20] After converting per capita expenditure in 2012 into 2010 GH¢

households, but increased to 19 percent for LEAP households in 2012. Also, 19 percent of Non-LEAP and 24 percent of LEAP households respectively owed debt at baseline, with statistically significant difference between these values.

Table 3. 3 Other Characteristics of LEAP and Non-LEAP Households

	Baseline (2010)			Post-LEAP (2012)		
Household Characteristics	NON-LEAP	LEAP	Diff	NON-LEAP	LEAP	Diff
Per Capita Expenditure	588.13	476.61	111.5**	782.88	579.77	203.1**
	(13.192)	(14.856)	(19.936)	(22.372)	(19.109)	(30.685)
Land ownership	0.692	0.515	0.177**	0.732	0.502	0.230**
	(0.016)	(0.020)	(0.025)	(0.015)	(0.020)	(0.024)
Land size (in acres)	3.142	3.003	0.139	2.760	2.462	0.298
	(0.135)	(0.301)	(0.289)	(0.150)	(0.156)	(0.237)
Own Animals	0.467	0.427	0.040	0.583	0.438	0.145**
	(0.017)	(0.019)	(0.026)	(0.017)	(0.020)	(0.026)
Remittance Receipt	0.413	0.175	0.24**	0.310	0.195	0.115**
	(0.017)	(0.015)	(0.023)	(0.016)	(0.016)	(0.023)
Debt Owe	0.189	0.240	-0.05**	0.303	0.271	0.032
	(0.013)	(0.017)	(0.021)	(0.016)	(0.018)	(0.024)
Insurance Members	1.129	1.141	-0.012	1.417	2.080	-0.663**
	(0.063)	(0.070)	(0.095)	(0.071)	(0.090)	(0.113)
Drinking water pipe	0.804	0.813	-0.009	0.801	0.819	-0.018
	(0.014)	(0.015)	(0.021)	(0.014)	(0.015)	(0.021)
Cooking fuel	0.762	0.676	0.086**	0.733	0.689	0.044**
	(0.015)	(0.018)	(0.023)	(0.015)	(0.018)	(0.024)
Electricity use	0.386	0.330	0.056**	0.497	0.498	-0.001
	(0.017)	(0.019)	(0.025)	(0.017)	(0.019)	(0.026)
Refuse disposal	0.449	0.218	0.231**	0.272	0.276	-0.004
	(0.017)	(0.016)	(0.024)	(0.015)	(0.018)	(0.023)
Own house	0.621	0.664	-0.043	0.647	0.579	0.068**
	(0.017)	(0.019)	(0.025)	(0.016)	(0.019)	(0.025)
Sample	858	646		858	646	

Standard errors in parentheses and ** means the difference is significant at 5%

In terms of access to portable water, approximately 80 percent and 81 percent of Non-LEAP and LEAP households had access to pipe-borne water at baseline respectively. There was also statistically significant difference between Non-LEAP (76 percent) and LEAP (68 percent) households in terms of the uses of wood/kerosene/charcoal as cooking fuel in 2010. Also, the difference in terms of the proportion of households in the two groups using electricity was statistically significant, with 39 percent and 33 percent respectively for Non-LEAP and

LEAP households. Lastly, at baseline, about 62 percent of Non-LEAP and 66 percent of LEAP households own a house.

For children characteristics (table 3.4), the average age of per child at baseline was 11 years for both LEAP and Non-LEAP households, with the proportion of males being 52 percent and 53 percent respectively for Non-LEAP and LEAP households. Also, at baseline there is a statically significant difference between the proportion of children who are sons/daughters of the household head with 64 percent of children in Non-LEAP and 57 percent of children in LEAP households being children of the head.

Table 3. 4 Mean Characteristics of Children in LEAP and Non-LEAP Households

	Baseline (2010)			Follow-Up (2012)		
	NON-LEAP	LEAP	Diff	NON-LEAP	LEAP	Diff
Age	10.929	11.089	-0.160	11.049	11.056	-0.007
	(0.106)	(0.118)	(0.159)	(0.109)	(0.121)	(0.163)
Boy	0.520	0.528	-0.008	0.528	0.525	0.003
	(0.014)	(0.016)	(0.022)	(0.015)	(0.017)	(0.023)
Son/Daughter of the head	0.644	0.570	0.074**	0.653	0.558	0.095**
	(0.014)	(0.016)	(0.021)	(0.014)	(0.017)	(0.022)
Sample	1204	935		1076	869	

Standard errors in parentheses and ** means the difference is significant at 5%

Turning to the educational outcome variables, it is evident from table 3.5 that, at baseline, there is statistically significant difference between Non-LEAP and LEAP households in relation to children's (5-17years) school enrolment, hours of class attendance, repetition rates and test scores. About 94 percent and 98 percent of children from Non-LEAP and LEAP households respectively were enrolled in school at baseline. The proportion enrolled in school increased to 97 percent for children from Non-LEAP households and 99 percent for those in LEAP households respectively two years after the implementation of the LEAP programme. Weekly hours of class attendance for children enrolled in school were approximately 25 hours per week for those in Non-LEAP households and 20 hours per week for their counterpart in LEAP households. However, the weekly hours of class attendance decreased for children in both Non-LEAP (19 hours per week) and LEAP (17 hours per week) households in 2012.

Also, the proportion of children from Non-LEAP and LEAP households who have ever repeated a class or grade was about 14 percent and 20 percent respectively; with statistically significant difference between them at baseline. However, during the follow up period (2012), repetition rate for children from LEAP households reduced to 16 percent, but that of children in Non-LEAP households increased to 16 percent. In addition, results of the Ravens test score show that between 2010 and 2012, the average score of children in Non-LEAP households increased significantly from 4.8 to 5.4; and that of LEAP children also increase from 4.4 to 4.9 out of a total score of 12. Lastly, there is a statistically significant difference in the educational outcome variables (enrolment, class attendance, repetition and test scores) of boys and girls in the LEAP and Non-LEAP groups (see table B2 in the appendix).

Table 3. 5 Educational Outcomes of Children in LEAP and Non-LEAP Households

	Baseline (2010)			Follow-Up (2012)		
	NON-LEAP	LEAP	Diff	NON-LEAP	LEAP	Diff
All Children (5-17 Years)						
Enrol	0.940	0.977	-0.037**	0.974	0.992	-0.018**
	(0.007)	(0.005)	(0.010)	(0.005)	(0.003)	(0.007)
Class Attendance[2]	24.831	20.133	4.698**	18.612	17.055	1.557
	(0.423)	(0.468)	(0.630)	(0.923)	(0.786)	(1.211)
Repetition[2]	0.136	0.202	-0.066**	0.160	0.159	0.001
	(0.015)	(0.014)	(0.021)	(0.011)	(0.013)	(0.017)
Test Scores	4.772	4.407	0.365**	5.431	4.949	0.482**
	(0.081)	(0.084)	(0.119)	(0.092)	(0.102)	(0.137)
Sample	1043	797		958	759	

Standard errors in parentheses and ** meaning the difference is significant at 5%
[2] refers to children enrolled in school only

Child Labour: Farming Households

From the baseline data, 82 percent of children in the LEAP farming households were in school as opposed to 85 percent of children in control households. The proportion of children from farming households in school increased in 2012 (Post-LEAP) among both LEAP and non-LEAP households, though the increment among the LEAP group is higher, as can be seen in table 3.6.

In addition, out of the total number of households that farmed, 48 percent of the LEAP households used children in 2010; this reduced to 39 percent in 2012. For Non-LEAP

households, the percentage of farming households that used child labour was about 35 percent in both periods. These children are persons below the age of 15 years[21]. These children were used for land preparation, field operations after planting, harvesting and post-harvesting activities. In terms of hours worked per day, on average, a child labourer in a LEAP household worked for 4.9 hours per day, while his/her counterpart in the Non-LEAP household worked for 2.8 hours per day in 2010. However, the average hours worked per day among children in households that received the LEAP declined to 4.6 hours in 2012, while those in Non-LEAP households increased to about 5 hours per day.

Table 3. 6 Children Involvement in Schooling and Farming Activities

	Pre-LEAP (2010)			Post-LEAP (2012)		
	Non-LEAP	LEAP	Diff.	Non-LEAP	LEAP	Diff.
Schooling Proportion	0.85	0.82	0.03	0.87	0.9	-0.03
	(0.01)	(0.02)	(0.03)	(0.02)	(0.01)	(0.01)
Child Labour Proportion	0.35	0.48	-0.13**	0.35	0.39	-0.04
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
Hours of work per day ^	2.78	4.85	-2.07**	4.95	4.57	0.38
	(0.11)	(0.15)	(0.18)	(0.15)	(0.19)	(0.25)

Standard errors are brackets and ** means difference between the two groups is significant at 5% significance level. These are for sub-sample of farming households and ^ means only working children.

Similar to the overall sample, farming households in the LEAP group were significantly different from those in Non-LEAP group at baseline. LEAP farming households have older heads, more orphans and widow, lower annual per capita expenditure and larger household size relative to Non-LEAP farming households (see table B3 in Appendix).

Households with Non-farm Enterprises

From our dataset, 29.67 percent of households interviewed were engaged in non-farm enterprises in 2010. This increased to 32.14 percent in 2012. The main activities of these enterprises include small agro-processing, retailing and petty trading, salt mining, baking, small restaurant and drinking spots as well as provision of carpentry and masonry services. Non-farm family work is the second sub-sector of the economy where Ghanaian children are employed. Table 3.7 shows characteristics of children in households with non-farm enterprises. From the table, there is a statistically significant difference in the proportion of

[21] The question was on the use or exchange of children below 15 years for farming activities.

children enrolled in school between the control and the treatment group at baseline in 2010. But school enrolment rates among children in both groups were similar in 2012, with that of the LEAP group being slightly higher (88 percent) than the Non-LEAP group (87 percent). In addition, children in the Non-LEAP households are slightly older than those in LEAP households. In terms of gender, about 50 percent of the children in households with non-farm enterprise were boys.

Table 3. 7 Children's Involvement in Schooling and Non-Farm Enterprise

	Pre-LEAP (2010)			Post-LEAP (2012)		
	Non-LEAP	LEAP	Diff.	Non-LEAP	LEAP	Diff.
Proportion in child labour	0.20	0.15	0.05	0.18	0.09	0.09
	(0.0195)	(0.0194)	(0.028)	(0.0197)	(0.0168)	(0.0268)
Proportion still in School	0.82	0.76	0.06	0.87	0.88	-0.01
	(0.0188)	(0.0233)	(0.029)	(0.017)	(0.019)	(0.026)
Average Age	11.5	10.8	0.7	13.08	12.75	0.33
	(0.179)	(0.209)	(0.274)	(0.153)	(0.175)	(0.115)
Boys	0.50	0.49	0.01	0.51	0.53	-0.02
	(0.0242)	(0.027)	(0.036)	(0.026)	(0.029)	(0.038)

** mean the difference is significant at 5%

Also, similar to the entire sample and farming households, LEAP households engaged in non-farm activities are relatively poorer in comparison to Non-LEAP household in both periods (see table B4 at the appendix). For instance, a lesser proportion of the LEAP households own livestock and received remittance in 2010. In addition, the treatment group (LEAP households) has more orphans and widows than the control group (Non-LEAP households) in both periods.

3.4.3 Estimation Strategy

Estimation of the effect of the LEAP programme on child welfare indicators is faced with the problem of lack of a counterfactual. Assuming that $T_i = 1$ if a household receives the LEAP and $T_i = 0$ if it does not, and Y_i = the outcome of the programme (child labour or schooling), then $Y_i(T_i)$ is the potential outcome for household i. The effect of the programme (γ_i) is then given by the difference in outcomes:

$$\gamma_i = Y_i(1) - Y_i(0) \quad (1)$$

However, it is not possible to observe simultaneously Y_i when $T_i = 1$ and $T_i = 0$. Experimental design which randomly assigns households to treatment and control groups overcome this problem by ensuring that the treatment status is uncorrelated with other variables so that the potential outcome can be attributed only to the programme. In a regression form, the impact of the LEAP programme on child welfare outcomes can be expressed as:

$$Y_i = \alpha + \gamma T_i + \varepsilon_i \quad (2)$$

Where all variables are as defined above and ε_i is the error term. Under randomisation, equation (2) can be estimated by Ordinary Least Square (linear probability model) or binary outcome models (probit or logit). Since the data collection for this study is non-randomised, the chapter employ various non-experimental methods (Propensity Score Matching-PSM; Difference-in-Difference-DD; and matching combined with Difference-in-Difference-MDD) to measure the impact of the LEAP programme on child labour and educational outcomes of children.

A. Propensity Score Matching (PSM)

Propensity Score Matching (PSM) method tries to mimic randomisation through the construction of a comparison group. The validity of PSM method rests on two main assumptions: conditional independence and region of common support. Conditional Independence Assumption (CIA) means that given a set of observed characteristics X which is unaffected by the programme, the potential outcomes Y are independent of the treatment assignment. The common support assumption $0 < P\ (Ti = 1|Xi) < 1$ ensures that the propensity score lies between zero and one in a given set of X. PSM estimates the probability of participating in the programme based on observed characteristics that are unaffected by the programme. The predicted probability is then used to match the LEAP and Non-LEAP households excluding households that are out of the region of common support.

Assume P_i equals the predicted probability that a household i is in the LEAP group (treatment group T) and received the LEAP and P_j is the predicted probability that a

household j in the Non- LEAP group received the LEAP (control group C). The matching estimator of the impact of the LEAP programme (γ) may be written as:

$$\gamma = \sum_{i\epsilon T}\left(Y_i - \sum_{j\epsilon C} W(P_{i,}P_j)Y_j\right) \quad (3)$$

Where W(.) is the function that assigns weights to be placed on the comparison household j and this weight function differs among the numerous matching estimators proposed in the literature. The PSM is implemented with (biweight) kernel matching technique since it uses all the households in the Non-LEAP (control) group and, hence, lowers the variance through the use of more information. Thus, unlike other matching methods such as the nearest neighbour and radius matching that use only a few observations from the Non-LEAP group, the kernel matching is a non-parametric estimator that uses the weighted averages of all individuals in the Non-LEAP to construct the counterfactual outcome. However, since all the households in the comparison group are used, there may be 'bad matches'. For this reason, the common support condition is imposed.

Two important considerations in the implementation of the kernel matching is the kernel function and the bandwidth employed. The biweight kernel function use is given by:

$$W(P_i, P_j) = \frac{\frac{K(P(X_i)-P\left(X_j\right))}{h}}{\sum_{k=1}^{N_0}\frac{K(P(X_i)-P(X_k)}{h}} \quad (4)$$

Where the biweight kernel is given by $K(s) = \frac{15}{16}(1-s^2)^2\ for\ |s| \leq 1$ and h is the bandwidth. The biweight kernel is symmetric and ensures that $\int K(s)ds = 1$ and $\int K(s)sds = 0$. However, as noted by DiNardo and Tobias (2001), the choice of the kernel function is relatively unimportant; what is important is the bandwidth or smoothing parameter (Pagan and Ullah, 1999). Choosing high bandwidth produces a smoother estimated density and decreases the variance between the estimates and the true underlying density function, but it may also result in biased results as the underlying features may be lost. There is a large literature on nonparametric estimation and the optimal bandwidth (Jones et al., 1996). What is important is that the estimates obtained should not be sensitive to the choice of the bandwidth (Todd, 1999). A bandwidth of 0.1 is used after trying with several bandwidths. The PSM results remain unchanged when the bandwidth was changed.

Another important factor in the implementation of PSM is the choice of covariates to be included in the propensity score model. The CIA requires that variables that influence a household's likelihood of participating in the treatment (the LEAP programme) but not influence the treatment be included in the estimation. Hence, it has been suggested in the PSM literature that variables that are fixed overtime or baseline variables collected before the treatment was implemented should be used in PSM model (Smith and Todd, 2005; Caliendo and Kopeinig, 2008). In this chapter, baseline variables that were collected before the implementation of the LEAP programme are used in the PSM estimation.

Based on the targeting criteria used in the selection of the LEAP recipients, baseline variables such as the head of household's marital status and gender, as well as, household characteristics, such as log of annual per capita expenditure, number of children in the household, land size, uses of electricity, source of drinking water, presence of widows in a household among other housing characteristics are included in the PSM estimation. Also, receipt of remittance and debt owing status of the household are included in the PSM model. The quality of the matching procedure is assessed with various methods, including a t-test of the difference in covariates means between the LEAP and Non-LEAP households before and after the matching (Rosenbaum and Rubin, 1983). Again, the success of the matching technique is evaluated with the reduction in the standardised bias and insignificance of the joint likelihood ratio of the matched sample, as well as, the insignificance of pseudo R^2 from the PSM estimation (Caliendo and Kopeinig, 2008).

B. Difference-in-Difference (DD)

Under this method, the impact of a LEAP programme is measured by looking at the difference in outcomes before and after the receipt of LEAP programme among LEAP (treated) and Non-LEAP (control) households. Since both pre-treatment and post-treatment data are available, DD method can be used to estimate the impact of an intervention by assuming that unobserved heterogeneity between the treated and the control groups are time invariant and uncorrelated with the treatment over time. This assumption implies that the change in outcome in the control group is an appropriate counterfactual. Thus,

$$E(Y_1^c - Y_0^c | T_1 = 0) = E(Y_1^c - Y_0^c | T_1 = 1) \quad (5)$$

Where $E(Y_1^c - Y_0^c | T_1 = 0)$ and $E(Y_1^c - Y_0^c | T_1 = 1)$ are the average changes in outcomes for the control group when treatment is zero and when treatment is one respectively. In the case of regression, the DD estimate of the impact of a programme is β_3 in equations (6) and (7) below:

$$y_{it} = \beta_0 + \beta_1 L_{it} + \beta_2 P_{it} + \beta_3 L_{it}.P_{it} + \varepsilon_{it} \quad (6)$$

$$S_{cit} = \beta_0 + \beta_1 L_{it} + \beta_2 P_{it} + \beta_3 L_{it}.P_{it} + \varepsilon_{it} \quad (7)$$

Where y_{it} is the child labour supply in farming (either participation or hour) of household *i* at time t (t=1, 2*);* S_{cit} is the educational outcome (enrolment, class attendance, repetition and test score) of a child *c* in household *i* at time t (t=1, 2*).* L_{it} is dummy variable for treatment (= 1 for household that receives the LEAP and =0 otherwise); P_{it} is a trend dummy variable (= 1 in 2012 and zero for 2010); $L_{it}.P_{it}$ is the interaction term and β_3 provides an estimate of the effect of LEAP which can be expressed as:

$$\widehat{\beta_3} = (\bar{y}_{2,T} - \bar{y}_{2,C}) - (\bar{y}_{1,T} - \bar{y}_{1,C})$$

Where $\bar{y}_{2,T}$ and $\bar{y}_{1,T}$ are mean outcomes for the LEAP households after and before the receipt of the LEAP, $\bar{y}_{2,C}$ and $\bar{y}_{1,C}$ are the after and before mean outcome for the Non-LEAP households. β_3 measures the effects of the LEAP on the average outcome and is the average treatment effect. This chapter includes other covariates likely to affect child labour supply and educational outcomes. The conditioning of the DD estimator on other covariates minimises the standard errors as long as the effects are unrelated to the treatment and are constant over time. Therefore, the DD regression equations (6) and (7) above become:

$$y_{it} = \beta_0 + \beta_1 LEAP + \beta_2 Year + \beta_3 LEAP * Year + \sum \varphi_i X_i + \varepsilon_{it} \quad (8)$$

$$S_{cit} = \beta_0 + \beta_1 LEAP + \beta_2 Year + \beta_3 LEAP * Year + \sum \varphi_i X_i + \varepsilon_{it} \quad (9)$$

Where y_{it} and S_{cit} are outcome variables as stated above, LEAP=1 if household receives the cash transfer and otherwise zero, Year=1 for post-LEAP and Year=0 for pre-LEAP and β_3 captures the impact of the LEAP. X is a vector of household characteristics that are likely to affect the child labour supply and educational outcomes (detailed description of these

variables can be found in table B1 in the appendix) and φ is a vector of parameters. Equations (8) and (9) are estimated with fixed effect[22] estimation technique in order to controls for unobserved and time-invariant characteristics that may influence the outcome variable. One important assumption of this DD estimation is the parallel trend. Since, the data cover only two periods, this assumption cannot be tested; however, this flaw is compensated for by combining the DD method with matching method as discussed below.

C. Matching Combined with Difference-in-Difference (MDD)[23]

The Propensity Score Matching (PSM) estimator is likely to be biased if there are unobserved variables that affect both participation in the LEAP and the outcome variables. Similarly, as stated earlier, one strong assumption underlying the DD estimates is the parallel trend assumption. This assumption implies that, in the absence of the treatment, the average outcomes for the LEAP and Non-LEAP group would have followed a parallel path over time. Following Grima and Görg (2007), the DD method is combined with matching technique to ensure that a Non-LEAP (control) group that is similar to the LEAP (treatment) group in all aspects is obtained. This is an improved estimator among non-experimental estimators (Smith and Todd, 2005) as both observed and unobserved characteristics likely to affect participation in the LEAP programme are taken into consideration. The matching ensures that observable imbalances in baseline covariates between the LEAP and Non-LEAP groups are eliminated.

Under this method, propensity score matching is done to find a subset of Non-LEAP households whose propensity scores are similar to those of the LEAP households in a first stage. In the second stage, the sample is restricted to these 'matched households' and DD estimation is performed on these households to determine the impact of the LEAP programme. Thus, after the matching, DD regression is ran on the LEAP and the 'matched Non-LEAP households' to ascertain the impact of the LEAP programme. This method is used because of the strong assumption of PSM (that is, selection into treatment is based on observables) and also because the parallel trend assumption under the DD method cannot be tested. Literature shows that the estimates improve significantly when matching method is combined with DD (Blundell and Costa Dias, 2000)[24].

[22] This will cause time-invariant variables to drop.
[23] The steps used under this method are similar to those in Khandker et al. (2010; pp 198-201).
[24] However, estimates from matching combined with DD method may be biased if there are time-varying unobservable variables.

Finally, as stated earlier, the chapter also examine heterogeneity in the impact of the LEAP programme. For educational outcomes, the sample is disaggregated by the gender and age of the child and separate regressions run for each subsample. In terms of child labour in farming, since the analysis is at the household level, this disaggregation is not possible. For this reason, the sample is split by the gender of the household head and the annual per capita income of the household. Ghana's 2013 extreme poverty line of GH792.05 (that is GH597.77 in 2010 Ghana cedis), which is equivalent to US$1.10 per day per person, is used to classify households with annual per capita income less than this poverty line as extremely poor; and those on or above this poverty line classified as non-extremely poor. Different estimations are carried out for each group.

D. Variable Definitions

As stated earlier, this chapter examines the impact of the LEAP programme on education and child labour. For education, it focuses on four main outcomes, namely school enrolment, hours of class attendance, repetition of a grade and test scores. School enrolment is a dummy variable equals to 1, if a child was enrolled in school the previous year and he/she is still in school, and otherwise 0. Class attendance refers to the number of hours that a child (who is enrolled in school) attends school in a week; while repetition is a dummy variable equals to 1 if a child has ever repeated a grade or level in school, and otherwise 0. Finally, test score refers to the scores that a child obtained from a Raven's Coloured Progressive Matrices test. The Raven's Coloured Progressive Matrices test consists of a set of 12 questions with each question having a set of images that the child must choose one to complete a picture. Each correct answer is given a score of 1 and 0 for incorrect answer; hence, the minimum and maximum scores that can be obtained are 0 and 12 respectively. This test measures a child's problem solving ability or cognitive ability. The test was administered to all children (5-17 years) irrespective of their schooling status.

In terms of child labour, the focus is on children's engagement in family farms and non-farm enterprises. For child labour in farming, the unit of analysis is the household. Child labour in farming is coded as 1, if a household used or exchanged children for farming activities in the last 12 months preceding the survey, and otherwise 0. The intensive margin of child labour in farming is measured as average hours of work per day per child labourer. Children's involvement in non-farm enterprises is analysed at the individual level. This is because

owners/operators of such enterprises were asked to list persons[25] working in such enterprises, and from this response it is possible to identify workers who are less than 18 years. They (workers less than 18 years) form the sample for this analysis. Hence, the dependent variable for extensive margin of child labour in non-farm enterprise is defined as a dummy variable which is equals to 1, if a child was engaged in non-farm enterprise and 0 otherwise. The daily hours of work done by a child in non-farm enterprise is used as a measure of the intensive margin of child labour in non-form works.

As stated earlier, the chapter uses three non-experimental methods namely PSM, DD and DD combined with matching. For each method, two models (i.e. model 1 and model 2) are estimated. Model 1 examines the impact of the LEAP programme on educational outcomes (enrolment, attendance, repetition, test scores) and child labour (in farming and non-farm enterprise) without the inclusion of control variables. Model 2 [26] uses a multivariate framework that involves the inclusion of control variables in the estimation to check the robustness of the results. The latter results are presented in the appendix[27] (see tables B7-B15 in the appendix).

3.5 Empirical Results and Discussion

This section briefly discusses the results of the propensity score matching that helped to obtain 'matched households' that are similar to the LEAP group before examining the impact of the LEAP programme on child labour and educational outcomes. The matching results show the variables or factors that affect the probability that a household will be selected into the LEAP programme. The accuracy of the results of the impacts of the LEAP programme on educational outcomes and child labour is, to a large extent, dependent on the quality of the matching estimation.

[25] Owners of such enterprises listed four important workers; hence, the number of children in non-farm enterprises may be understated, since owners of such enterprises with more than four employees will likely not include children in the listed four.

[26] Equations 8 and 9 are estimated without the Xs in model 1 and then estimated with the Xs in model 2.

[27] These control variables include the gender and age of the child (average age and proportion of boys for child labour in farming), as well as his/her relationship to the household head. Also, included in the regression are age, gender, years of schooling and marital status of the household head, the size of the household, ownership of farmland and the regional location of the household. Detail definition of these variables is presented in table B1 in the appendix.

3.5.1 Participation in the LEAP Programme at Baseline (Matching Results)

The results (table B5, in the Appendix) from the matching estimation indicate that per capita expenditure (in logs) negatively affect the probability of participation in LEAP. Thus, consistent with the selection criteria, poorer households are more likely to participate in the LEAP programme. This is confirmed by other housing characteristics, such as the use of electricity for cooking and having a proper refuse dumping place, which all have a negative effect on the probability of becoming a LEAP recipient. Similarly, households that own land, receive remittance, and have more members registered on the National Health Insurance Scheme had lower probabilities of participating in the LEAP programme. Lastly, the presence of a widow, an orphan, an elderly person (65 years and above) and child labourers in the household increase a household's probability of participation in the LEAP programme.

Finally, the quality of our matching procedure is satisfactory as the matching method balanced the treatment and control groups at baseline. For instance, the t-test of the difference in covariates means between the LEAP and Non-LEAP households indicate that there are no statistically significant differences between these groups. Also, the matching technique reduces the standardised bias and the joint likelihood ratio. In addition, the pseudo R^2 became insignificant after the matching (Caliendo and Kopeinig, 2008). The results from the matching, thus, show that the balancing requirements of the PSM method were satisfied (see appendix tables B6a-B6b).

3.5.2 Impact of the LEAP Programme

This section presents the regression results for the impact of LEAP programme on educational outcomes and child labour. As indicated earlier, the study uses three different estimations: the Propensity Score Matching (PSM), the Difference-in-Difference (DD) and Matching with Difference-in- Difference (MDD). The results for all three estimation methods are presented. However, in interpreting the results, more focus is placed on the results from the MDD estimation since it is the preferred estimator among the three (Smiths and Todd, 2005). In all tables, column 1 reports the PSM estimates, while columns 2 and 3 report the results for the DD and MDD respectively.

Impact of LEAP on Educational Outcomes

This section presents the regression results for impact of LEAP programme on school enrolment, weekly hours of class attendance, repetition rate and test scores (Raven Test Scores). This is followed by a discussion of the impact of the LEAP programme on school expenses. Generally, similar results are obtained when control variables are included in the estimations (see tables B7-B10 in the appendix).

School Enrolment

Table 3.8 presents the results of the impact of the LEAP programme on school enrolment rate for children aged 5-17. For the overall sample, the LEAP programme does not have any significant impact on school enrolment (MDD column in table 3.8). This result is similar to the results found by de Groot et al (2015) on the LEAP and school enrolment. However, when the sample is split by gender of the child, it emerges that the programme has a positive effect on boys' school enrolment, but no effect on girls' school enrolment. Specifically, the probability that boys in households that benefited from the LEAP programme will enrol in schools is 2.7 percentage points higher than their counterparts in Non-LEAP households. This result may be explained by the belief in Ghana, especially in rural areas, that it is better to send a boy to school instead of a girl (Keller et al., 1999). This belief may stem from the fact that most parents in Ghana look up to their children for support in their old age. They consider investment in girls' education as unprofitable since girls are expected to marry and assist their husbands to cater for their children (Anyanful et al., 2001); hence most parents prefer to have sons instead of daughters (Frempong and Codjoe, 2017). The study also lend credence to an earlier study in Zambia by the American Institutes for Research (2015), where the country's Child grant led to an increase in school enrolment among boys with no effect on girls.

In addition, results from disaggregation of the sample into age groups indicate that the LEAP programme had no significant effect on school enrolment of younger children aged 5-12; but it increased the enrolment for older children (aged 13-17) significantly by approximately 9.6 percentage points. These results are similar to the results found by de Groot et al. (2015). Contrary to this study, other studies report significant increase in school enrolment in younger children – Maluccio and Flore (2004) in Nicaragua (17.7percent increase) and Ward et al. (2010) in Kenya (6-7percent increase). It has been found that the effects of most CCT

programmes on schooling tend to be larger in settings with lower initial conditions. Thus, the effects of CCT on school enrolment are larger in areas with lower enrolment rates at baseline (Fiszbein and Schady, 2009; Saavedra and Garcia, 2012). Hence, these results are not surprising, since primary education in Ghana is almost universal with gross enrolment rate of over 100 percent.

Table 3. 8 Impact of LEAP on School Enrolment Rate for Children

	PSM	DD	MDD
Overall Sample	0.0216**	0.0141	0.0113
s.e.	(0.00886)	(0.0105)	(0.0106)
N	2,095	3,557	2,765
Boys	0.05445**	0.0269*	0.0269***
s.e.	(0.0288)	(0.0163)	(0.0061)
N	1,112	1,876	1,445
Girls	0.00226	0.00461	0.00382
s.e.	(0.0156)	(0.0128)	(0.0131)
N	953	1,681	1,289
Young Children (Age 5-12 Years)	-0.00267	-0.0144	-0.0144
s.e.	(0.00373)	(0.00959)	(0.0098)
N	1,379	2,234	1,635
Older children (Age 13-17 Years)	0.0617	0.0886**	0.0958**
s.e.	(0.052)	(0.0361)	(0.0382)
N	431	1,323	850

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

Class Attendance

In terms of class attendance, the MDD results (table 3.9) for the overall sample show a positive and significant increase in class attendance of approximately 5.2 hours per week for children whose households received the LEAP cash transfer relative to those from non-beneficiary households. Similarly, the LEAP programme significantly increases class attendance of younger children aged 5-12 years and boys by 5.8 hours and 4.5 hours per week respectively. However, the scheme had no significant impact on the weekly hours of class attendance of girls and older children (13-17 years). This may be due to the fact that there is preference for boys relative to girls among parents in Ghana (Frempong and Codjoe, 2017)

since parents consider investment in boys 'human capital to be more "profitable" than investment in girls' human capital (Anyanful et al., 2001).

Table 3. 9 Impact of LEAP on Weekly Hours of Class Attendance

	PSM	DD	MDD
Overall Sample	5.183	6.452***	5.159**
s.e.	(2.823)	(1.896)	(2.092)
N	938	2,526	2,001
Boys	3.893	5.372**	4.462***
s.e.	(3.997)	(2.540)	(2.804)
N	483	1,321	1,040
Girls	5.656*	6.511	4.916
s.e.	(2.774)	(5.982)	(3.233)
N	440	1,205	949
Young Children (Age 5-12 Years)	1.374	6.170**	5.791***
s.e.	(3.182)	(2.446)	(1.699)
N	1,068	1,604	1,220
Older Children (Age 13-17 Years)	5.75	6.806	6.906
s.e.	(6.784)	(5.674)	(4.156)
N	461	922	660

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

Comparing this result with the scheme's impact on enrolment depicts an interesting picture. Poor households do not send more children to school after receiving the LEAP, but rather they allow their children who are already in school to spend more hours in the classroom. One explanation for this is that most, if not all of their children, are already in school. Similarly, studies on the impact of cash transfers in other African countries, such as UNICEF (2012) in South Africa and Miller et al. (2008) in Malawi, also found significantly positive impact of such schemes on school attendance. However, in Kenya and Tanzania, Ward et al. (2010) and Evans et al. (2014) respectively found insignificant impacts. Also, elsewhere in Brazil (Yap et al., 2002; Cardoso and Souza, 2004) and in Costa Rica (Duryea and Morrison, 2004) cash transfer schemes had statistically significant and positive impact on school attendance of children.

Repetition Rate

Generally, it is expected that CCT programmes reduce the rate at which children repeat a class or a grade. Consistent with this general expectation, the MDD results in table 3.10 depict that participation in the LEAP programme reduces class repetition of children significantly by about 11 percent. Also, the LEAP programme reduces boys' and older children's (age 13-17years) repetition rates by approximately 12 percent and 15 percent respectively. However, the repetition rates of girls and younger children (5-12 years) were not affected by the scheme.

Table 3. 10 Impact of LEAP on Repetition Rate of Children

	PSM	DD	MDD
Overall Sample	-0.0027	-0.106***	-0.108***
s.e.	(0.0365)	(0.0369)	(0.0383)
N	1,809	3,130	2,319
Boys	0.0462	-0.123***	-0.118**
s.e.	(0.0381)	(0.0463)	(0.0487)
N	990	1,678	1,231
Girls	-0.0831	-0.0668	-0.0811
s.e.	(0.0628)	(0.0622)	(0.0642)
N	787	1,452	1,053
Young Children (Age 5-12 Years)	0.0181	-0.075	-0.0762
s.e.	(0.036)	(0.0752)	(0.077)
N	1,331	1,773	1,157
Older Children (Age 13-17 Years)	-0.0127	-0.172**	-0.148**
s.e.	(0.129)	(0.0701)	(0.0733)
N	324	1,357	873

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

This result seems to suggest that the LEAP programme did not lead to the 'classroom congestion effect' as suggested by theory, since the scheme did not result in an increase in enrolment, but rather it increased the hours of class attendance of existing pupils. This may have contributed to the reduction in class repetition. Consistent with the results here are studies by UNICEF (2012) and Evans et al. (2014) in South Africa and Tanzania respectively, which show statistically significant decreases in children's class/level repetition rate due to cash transfer schemes. In contrast, in Columbia, Barrera et al. (2011) report that

cash transfers increase class repetition rate; and, in Lesotho, Pellerano et al. (2014) found no significant impact on repetition rate.

Test Scores (Cognitive Ability)

With respect to test scores, the MDD estimations showed no significant impact from the LEAP programme as shown by table 3.11. This result may be attributed to the short duration between the implementation of the scheme and the evaluation of its impacts. Cognitive ability takes time to improve and, as such, the two years interval between the LEAP programme implementation and the follow-up data collection may be too short to observe any changes in cognitive achievement.

Table 3. 11 Impact of LEP on Test Scores of Children

	PSM	DD	MDD
Overall Sample	-0.413*	-0.116	-0.244
s.e.	(0.214)	(0.21)	(0.233)
N	1,878	3,168	2,460
Boys	-0.581**	-0.0703	-0.0644
s.e.	(0.373)	(0.295)	(0.321)
N	1,022	1,672	1,282
Girls	-0.186	-0.173	-0.344
s.e.	(0.364)	(0.309)	(0.343)
N	850	1,496	1,151
Young Children (Age 5-12 Years)	-0.334	-0.0286	-0.145
s.e.	(0.267)	(0.269)	(0.293)
N	616	2,173	1,637
Older Children (Age 13-17 Years)	-0.915	-0.578	-0.64
s.e.	(0.757)	(0.526)	(0.591)
N	218	995	578

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

There are few studies on CCT and test scores. A review of the literature shows mixed results. Studies, such as Ponce and Bedi (2008), Behrman et al. (2009), Filmer and Schady (2009), and Duryea and Morrison (2004), report insignificant impact of CCT programmes on test scores. The results from this chapter do not corroborate earlier findings in Mexico's

Oportunidades (Dubios et al., 2012), in Columbia (Barrera et al. 2011) and in South Africa (UNICEF, 2012), where such programmes resulted in improvements in test scores.

Impact on School Expenses

Receipt of LEAP might impact positively on educational outcomes when poor households facing credit constraint use the money to finance the education of their children. Hence, this section examines the effect of the LEAP programme on educational expenses to ascertain whether the recipients spent the cash on their children's education or not.

Table 3. 12 Impact of the LEAP on School Expenses of Children

	PSM	DD	MDD
Uniform and Clothing	-0.1	0.0885	0.0432
s.e.	(0.0641)	(0.0755)	(0.0897)
N	977	2,233	1,760
Books and School Supplies	-0.195**	-0.144	-0.121
s.e.	(0.0822)	(0.0965)	(0.0737)
N	1,225	2,702	2,132
Food and Boarding	-0.524***	0.115	0.0893
s.e.	(0.114)	(0.119)	(0.138)
N	1,016	2,161	1,739
Total Expenses	-0.459***	0.00409	0.0311
s.e.	(0.0904)	(0.0802)	(0.0887)
N	1,823	3,536	2,739

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

From table 3.12, the LEAP programme did not have any significant impact (MDD column) on school expenditure for the overall sample. This is true for total expenditure, as well as the various school expenditure items. When the sample is disaggregated by the gender of the child (table B11 in the appendix), the results show that, again, the LEAP programme did not have any significant impact on schooling expenditure for girls. However, for boys, the MDD results indicate that the LEAP programme had a significant and positive impact on total schooling expenditure. Again, for younger children, aged 5-12 years, the MDD results (table B11 in appendix) show that the LEAP programme significantly reduced expenditure on books and other school supplies; but it increased uniform and school clothing expenses by 22 percent. For older children, aged 13-17 years, the LEAP programme significantly increases

the total educational expenditure by about 27 percent. Extensive literature search revealed few studies with focus on the impact of cash transfers on children's schooling expenditure. The only study in the literature is by Miller et al. (2008)[28] in Malawi, where they find that Malawi's Mchinji Social Cash Transfer increases children's schooling expenditure.

Impact on Child Labour

The estimated impact of the LEAP programme on participation and daily hours of work are discussed below. The section begins with child labour in farming followed by child labour in non-farm enterprises. In the discussion of the results that follows, the focus will mostly be on the MDD results, as stated earlier.

Child Labour in Farming

Tables 3.13 and 3.14 report the results of the impact of the LEAP programme on the extensive and intensive margin of child labour in farming respectively. From table 3.13, participation in the LEAP programme had no effect on the probability of households' using or exchanging of children for farming activities in the overall sample and all subsamples except female headed households. Though the scheme had negative effects on child labour participation in the overall sample, extremely poor and male headed households, these effects were statistically insignificant. However, for households that are headed by women, participation in the LEAP programme reduces the probability of using or exchanging children for farm works by 8.2 percentage points. This result is consistent with other studies (Altanasio et al., 2006; Cardoso and Souza, 2004; Asfaw et al., 2012) that found no effects of CCT programmes on children's participation in the labour market. The results here seem to support the suggestions that children tend to benefit more when resources are in the hands of women relative to men (Quisumbing et al., 1995; Thomas, 1990).

[28] To the best of my knowledge this is the only study that examined a cash transfer programme and schooling expenses.

Table 3. 13 Impact of LEAP on Children Participation in Farming Activities

	PSM	DD	MDD
Overall Sample	0.0055	-0.0811	-0.0495
s.e.	(0.0607)	(0.0502)	(0.0506)
N	774	1,899	1,695
Extremely Poor	0.0299	-0.0952	-0.0817
s.e.	(0.0726)	(0.0885)	(0.0892)
N	235	608	550
Non-Extremely Poor	0.163	0.0912	0.09132
s.e.	(0.103)	(0.113)	(0.113)
N	521	1,284	1,139
Male Headed	0.0669	-0.0153	-0.00181
s.e.	(0.0776)	(0.067)	(0.068)
N	451	1,029	941
Female Headed	0.0129	-0.124***	-0.0815***
s.e.	(0.231)	(0.0106)	(0.0114)
N	317	868	753

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

In terms of intensive margin of child labour in farming, the results in table 3.14 show that the LEAP programme had a negative impact on the daily hours of farm work for the overall sample and all subsamples except non-extremely poor households. The largest impact of the programme occurred in female headed households. Specifically, participation in the LEAP programme reduces daily hours of farm work done by children by approximately 2.6 hours in the overall sample. However, when the sample is split, it emerges that the LEAP programme led to approximately 2.7 hours, 2.2 hours and 2.1 hours reduction in the intensity of work done by children in female headed, extremely poor and male headed households respectively. This result supports an earlier study in Brazil where the PETI programme had a negative impact on hours of work done by children. It, however, contradicts Parker and Skoufias' (2000) study on the Mexican Progresa scheme where it was found that the scheme had no effect on the intensity of work done by child labourers.

These results seem to suggest that the LEAP programme does not influence households' decision to use or exchange their children for farming activities; but they reduce the intensity of work done by children who are already in the labour market. The reduction in the daily hours of work done by children on farms may be possible under these two scenarios. Firstly,

the receipt of cash may enable households to hire adults to work on their farms instead of using children. This will result in a fall in the hours of work done by children. Secondly, the transfer of income to poor households may cause them to shift from farming into other businesses that may not require the use of children. Inclusion of control variables does not change these results in terms of significance (see tables B12-B13 in the appendix).

Table 3. 14 Impact of LEAP on Children's Working Hours in Farming

	PSM	DD	MDD
Overall Sample	-1.216**	-2.826***	-2.595***
s.e.	(0.517)	(0.439)	(0.435)
N	311	759	683
Extremely Poor	-1.508*	-2.409***	-2.235***
s.e.	(0.777)	(0.716)	(0.698)
N	197	252	228
Non-Extremely Poor	-0.444	-1.288	-1.288
s.e.	(0.678)	(0.999)	(0.999)
N	205	504	453
Male Headed	-0.587	-2.517***	-2.082***
s.e.	(0.784)	(0.563)	(0.538)
N	187	417	385
Female Headed	-0.526	-2.867***	-2.673***
s.e.	(1.037)	(0.768)	(0.771)
N	121	341	298

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

Child Labour in Non-Farm Enterprises

Tables 3.15 and 3.16 show the impacts of the LEAP programme on child labour in non-farm enterprises. From table 3.15, the LEAP programme had no effect on children's participation in non-farm enterprises in the overall sample and all subsamples. This result supports Attanasio et al.'s (2006) study on Colombia's Familias en Accion scheme which found no effect on children's participations in income generating activities.

Table 3. 15 Impact of LEAP on Children's Participation in Non-Farm Works

	PSM	DD	MDD
Overall Sample	-0.021	-0.0371	-0.000884
s.e.	(0.0737)	(0.0481)	(0.0681)
N	512	1,450	680
Extremely Poor	0.0816	0.054	0.0391
s.e.	(0.143)	(0.121)	(0.113)
N	156	452	279
Non-Extremely Poor	-0.0461	-0.0367	-0.0697
s.e.	(0.0761)	(0.0752)	(0.0993)
N	404	1,098	801
Boys	0.103	0.0209	0.0879
s.e.	(0.129)	(0.0552)	(0.0832)
N	205	741	553
Girls	-0.316	-0.0949	-0.0929
s.e.	(0.298)	(0.0671)	(0.0853)
N	192	709	327

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

Similar to the above results, the LEAP programme had no effect on the daily hours of non-farm work done by children in the overall sample and all subsamples as depicted in table 3.16. Controlling for the child and household characteristics did not change these results (see tables B14-B15 in the appendix).

Table 3. 16 Impact of LEAP on Hours of Non-Farm Works

	PSM	DD	MDD
Overall Sample	-1.234	1.537	2.451
s.e.	(0.806)	(1.111)	(2.376)
N	210	234	122
Extremely Poor	1.0513	1.164	1.362
s.e.	(1.159)	(1.156)	(1.814)
	101	188	172
Non-Extremely Poor	-1.442**	1.857	-0.296
s.e.	(0.676)	(1.655)	(1.993)
N	123	386	295
Boys	-1.001	0.483	2.225
s.e.	(1.252)	(1.446)	(2.809)
N	105	294	252
Girls	-3.251**	-1.454	-0.733
s.e.	(1.453)	(1.324)	(0.835)
N	101	240	170

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

Impact on Households' Engagement in Farming and Non-Farming Enterprises

Finally, this section explores the impact of the LEAP programme on households' engagement in farming and non-farm enterprise for the overall sample in table 3.17. The results show that the scheme had a negative impact on farming[29], but it had no effect on the establishment of non-farm enterprises. This suggests that households reduced their farming operations after receiving the LEAP cash transfer, but do not change their engagement in non-farm enterprises. This may possibly explain the reduction in the intensive margin of child labour in farming. Working children reduced their daily hours of work on family farms probably because households reduced their farming activities after receiving these cash transfers.

Similarly, the insignificant effect of the LEAP programme on child labour in non-farm enterprises may be due to the fact that the scheme did not affect households' engagement in

[29] Though table 3.1 shows that the number of farming households in the LEAP group in 2012 was more than those in 2010, this result indicates that the increase was not caused by the LEAP programme.

such enterprises. Overall, the results seem to support earlier work by Mochiah et al. (2014) in Ghana, where they found out that the LEAP programme reduced adult labour supply in farming and had no impact on adult labour supply in non-farm enterprises.

Table 3. 17 Impact of LEAP on Households' Engagement in Businesses

	PSM	DD	MDD
Farming	-0.0487	-0.0466***	-0.100***
s.e.	(0.0503)	(0.0219)	(0.0299)
Non-Farm Enterprises	-0.0715	0.0799	0.0776
s.e.	(0.0596)	(0.0493)	(0.0584)
N	1493	3,008	2844

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, N=sample size

3.6. Conclusion and Policy Recommendations

The rapid expansion of Cash Transfer programmes in Africa, and in particular Sub-Saharan Africa (SSA), can be attributed to the success of these programmes at improving the education and health outcomes of beneficiaries in Mexico and Brazil. The success of CCT programmes in Latin American countries, however, does not guarantee their success in other countries. Despite, the rapid expansion of these programmes in Africa, there are limited studies on such schemes in the sub-region. Hence, this chapter examines the impact of a CCT (Livelihood Empowerment Against Poverty-LEAP) programme on educational outcomes (enrolment, class attendance, repetition and test scores) and child labour in Ghana.

The chapter uses a longitudinal data and employs three quasi-experimental methods (Propensity Score Matching, Difference-in-Difference and Matching combined with Difference-in-Difference) in estimating these impacts. Both the impact of the LEAP programme on educational outcomes and child labour in non-farm enterprises are analysed at the individual level; while children's involvement in farming is analysed at the household level since the main question on child labour was asked at that level. Also, the chapter examines heterogeneity in the impact by splitting the sample into various groups (gender and age of the child, gender of the household head and the annual per capita income of the household).

The results show that participation in the LEAP programme has no significant effect on school enrolment for the overall sample, younger children (5-12 years) and girls, but it did increase enrolment rates of boys (2.7 percentage points) and older children aged 13-17 years (9.6 percentage points). In terms of class attendance, it emerges that there is a positive and statistically significant relationship between the LEAP programme and weekly hours of class attendance. Overall, the LEAP programme increased the weekly hours of class attendance of children in beneficiary households by 5.2 hours. When the sample is split by the gender and the age of a child, these results changed slightly. The LEAP programme increased the weekly hours of class attendance of boys and younger children (5-12 years) by 4.5 hours and 5.8 hours respectively. However, the programme had no impacts on the weekly hours of class attendances of girls' and older children (13-17 years). For class repetition, the LEAP programme had a significant and negative effect in the overall sample as well as boys and older children subsamples; but it had no effect on the repetition rates of girls and younger children (5-12 years). Specifically, the repetition rate of children in households that benefited from the LEAP programme was reduced by about 11 percentage points, 12 percentage points and 15 percentage points for the overall sample, boys and older children respectively. Lastly, the LEAP programme had no statistically significant impact on test scores (cognitive ability).

One of the channels through which the LEAP programme may impact educational outcomes is through its effect on purchases of educational supplies. Thus, it is expected that expenditure on schooling would increase once poor households are given this cash transfer. This chapter investigated this hypothesis by estimating the impact of the LEAP programme on total school expenditure as well as individual school items (uniform and clothing; books and school supplies; food and boarding). Overall, the LEAP programme had no impact on school expenditure (both the total expenses and the individual items) for the overall sample and girls. The scheme increased the total school expenditure for boys and older children (13-17 years); but it reduced the expenditure on books and school supplies for younger children (5-12 years). Controlling for individual and household characteristics did not change these results in terms of statistical significance.

With regard to child labour in farming, the scheme had no effect on the extensive margin of child labour in the overall sample and all subsamples, except in female headed households. The LEAP programme reduced the probability of child labour in farming in female headed household by 8.2 percentage points. In addition, the results show that the LEAP scheme

decreased the hours of farm work done by children in the overall sample and all sub-samples, except working children in non-extremely poor households. Specifically, participation in the LEAP programme reduced the daily hours of child labour on farms by about 2.6 hours in the overall sample, with the highest reduction in hours of farm work done by children occurring in female headed households, where the reduction in the intensity of child work was about 2.7 hours. Lastly, unlike child labour in farming, the results of this chapter show that the LEAP programme had no effect on both the extensive and intensive margins of child labour in non-farm enterprise in the overall sample and all sub-samples. Thus, there was no difference in both the probability of child labour and hours of work in non-farm enterprises done by children in LEAP and Non-LEAP households.

Generally, the LEAP programme reduced farming, but it had no impact on households' engagement in non-farm enterprises. This suggests that households may have abandoned farming after receiving the cash transfer and this reduction in farming may have led to the reduction in the daily hours of farm work undertaken by children. Conversely, the LEAP had no effect on households' engagement in non-farm enterprise and, as such, both the extensive and intensive margins of child labour in these enterprises were not affected by the scheme.

The results of the impact of the LEAP programme on educational outcome (school enrolment, class attendance, repetition rate and test scores) and child labour (farming and non-farm) give several policy directions with regard to development of human capital in Ghana. Firstly, from the results, it is evident that the LEAP programme had no impact on the education of the girl child. Though the LEAP scheme had a positive impact on school enrolment and hours of class attendance, and a negative impact on repetition rate of boys, the scheme did not affect any of the educational outcomes of girls. This implies that other policy interventions specifically targeting girls' education, such as public education and sensitization programmes on the importance of girls' education, need to be implemented if girls' education is to be improved in the country. Secondly, the LEAP programme had no significant impacts on test scores (cognitive ability). This may imply that perhaps other interventions that address early childhood nutrition and education should be implemented, since the development of cognitive ability starts at an early stage of a child's development.

Finally, the findings in this chapter show that the LEAP programme did not affect the extensive margin of child labour in farming and non-farming activities. It follows then that

for the elimination of child labour to be achieved, the programme should be supplemented with other interventions, or the amount of cash received should be increased, as suggested by Daidone and Davis (2013). Also, this chapter's findings lend credence to the suggestion by Mochiah et al. (2014) that subsequent targeting of transfers must be 'carefully done' to produce the anticipated results. The results show that gender dimensions and poverty levels should guide policy makers in the design and targeting of this cash transfer scheme. Based on the findings of this chapter, it can be argued that targeting should focus more on extremely poor and female headed households, as the disaggregated results show that the largest consistent impact of the cash transfer occurred in such households. Lastly, the findings suggest that other social interventions or policies that seek to empower and effectively target female headed and extremely poor households will be a welcome development towards reducing children's participation in the labour market in Ghana.

CHAPTER 4: The Impact of Women's Autonomy in the Household on Child Labour and Schooling: Evidence from Ghana

4.1 Introduction

The effects of different household members' decision making power (particularly that of women) on children's outcomes has been widely examined in both developed and developing countries. Women's decision making autonomy or bargaining power in households is one of the most significant factors that influence children's schooling and child labour decisions especially in Sub-Saharan Africa (SSA) countries, where direct cost of schooling is mostly low (Luz and Agadjanian, 2015). Even in cases where the direct costs of schooling are high, the allocation of the household's resources among various goods, particularly on children's products depends on the degree of decision making autonomy of the husband and the wife. Empirical evidence has shown the importance of women's decision making autonomy on child welfare outcomes (Durrant and Sathar 2000, Yabiku, Agadjanian, and Sevoyan 2010; Shroff et al., 2011). This chapter examines the effect of a mother's decision making autonomy or bargaining power on her children's schooling and labour supply in Ghana.

Ghana presents a useful case study for this analysis in the sense that about half of the country's population live in rural areas (Ghana Statistical Service, 2016). Urban women have more decision making power than their counterpart in rural areas (Bogale et al., 2011). This is so because women in urban cities have more opportunities for paid work; and customs and norms regarding gender ideology may be less enforced in cities. In addition, most households in Ghana are headed by males; these heads are very influential in decision-making. Furthermore, in most households in Ghana, pooling of resources and joint decision making between men and women are not the norm (Baden et al., 1994). Women tend to have lower decision making power or autonomy relative to men.

There is no agreement on the definition and measurement of autonomy at the household level (Mason, 1997; Mason and Smith, 2000; Luz and Agadjanian, 2015). Most studies often focus on women's participation in economic activities; and use their control over economic resources as a proxy for bargaining power or autonomy. For instance, while some studies use

public provision of resources to women (Lundberg et al., 1997); others use the share of income earned by women, unearned incomes received by women, women inherited assets, women's assets at the time of marriage and their current assets as measures of their autonomy (Hoddinott and Haddad, 1995; Quisumbing, 1994; Thomas et al., 1997; Doss, 1996). However, women's autonomy is not only about their access to resources, but also their freedom to act independently. Thus, women's abilities to formulate choices and participate in decision making are all part of their autonomy (Adhikari, 2016). Several studies have shown that labour force participation and access to resources do not necessary lead to improvements in women's autonomy (Balk, 1997; Jejeebhoy and Sathar, 2001; Malhotra et al., 1995).

Another important dimension of women's autonomy is their involvement in households' decision making, especially in patriarchal societies like in most Sub-Saharan African (SSA) countries, where there is male dominance. In such societies, educated or employed women may fail to translate their preferences into actual behaviour, if their husbands are opposed to such preferences (Woldemicael, 2010). For instance, gender inequality and patriarchy which assign different roles to men and women often result in low contraceptive usage and high fertility rates (Balk, 1994; Basu, 1992; Caldwell, 1986; Dharmalingam and Morgan, 1996; Morgan and Niraula, 1995). This chapter thus adopts a non-economic measure of women's autonomy and examine its impact on schooling and child labour.

The measure of mothers' autonomy used in this chapter is an index constructed from five questions pertaining to: (i) a woman's participation in important decisions of the household; (ii) a woman's right to express her opinions if she disagrees with her husband; (iii) a woman's right to use her earned income on herself and her children; (iv) a woman's ability to contact her family without limitation; (v) and a woman's ability to go out without her husband insisting on knowing where she is at all time.[30] The chapter examines how a mother's involvement in these decisions impacts on her children participation in school and the labour market, as well as the hours of school and work they supply. Specifically, the chapter seeks to answer the following research questions: What are the main determinants of a mother's autonomy or bargaining power in the household? How does a mother's autonomy impact on her child's welfare in terms of schooling and child labour decisions? Is the

[30] The exact questions asked and the construction of this index is explained later.

relationship between a mother's autonomy and her child's welfare similar among children in rural and urban areas? And is this impact similar for boys and girls?

Women empowerment has been on the development agenda of most Sub-Saharan African (SSA) countries in recent years. The findings of this study will assist in policy formulation for the advancement of women and the reduction of the gender inequality that exist in Ghana and the sub-region as a whole. In addition, the study will help in the formulation of policies for child labour elimination and promotion of schooling in Ghana and, by extension, other SSA countries.

Finally, this study expands the literature on women's autonomy and its impact on child welfare. The unitary model has been used to analyse the decision making behaviour of household for decades. Recent research, however, has shown that this model does not work well when household members have different preferences or degrees of control on their own resources (Strauss and Thomas, 1995; Behrman, 1997; Haddad, Hoddinott and Alderman, 1997). Few studies have adopted the collective model. For those that have, most of them usually include potentially endogenous variables related to women's autonomy within the household directly in the outcome equation (Reggio, 2011). This chapter serves as a possible basis for further studies on mothers' autonomy particularly in developing countries.

This chapter answers the above research questions with a nation-wide survey conducted in Ghana in 2010 by Yale University in collaboration with the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana. One possible problem that may be encountered in analysing the impact of a woman's autonomy on her children's welfare is the possibility of endogeneity of the autonomy variable. This problem has been recognised by recent studies (Pollak, 2005; Basu, 2006; Anderson and Eswaran, 2009; Reggio, 2011; Eswaran and Malhotra, 2011). This study overcomes this problem by using both instrumental variable (IV) and non-instrumental estimation techniques. This is done for the overall sample and for children in urban and rural areas separately. Also, different regressions are carried out for boys and girls.

The results show that increase in mothers' decision making autonomy increases school enrolment for the overall sample and all subsamples. However, in terms of hours of class attendance, mothers' bargaining power or autonomy has positive impact on the overall

sample, girls and rural subsample, but no effect on boys and urban children. In addition, the results indicate a negative effect of mothers' decision making autonomy on both child labour participation and hours of child labour. Girls benefit more from an improvement in mothers' decision making autonomy relative to boys. Finally, increase in the autonomy of women has bigger impacts on rural children's welfare in comparison to urban children.

The rest of this chapter is sub-divided into the following sections. Section two provides a review of both theoretical and empirical studies on household decision making models and how a mother's autonomy affects her child's outcomes. The data used and the methodology employed in estimating the impacts of a woman's autonomy on her child's welfare are outlined in section three. This is followed by section four that discusses the main findings. Section five presents the conclusions and policy recommendations.

4.2 Review of the Relevant Literature

Theoretical Literature

Analysis of a household as a unit has gone through three main development since the 1970s (Ambreen, 2013). Firstly, models used in such analyses have moved from assuming that household members are altruistic, co-operative and engage in sharing into models that include negotiation, bargaining and even conflict. Secondly, households are no longer seen as a bounded unit, but rather they are permeable. Finally, households are now seen as entities with massive variation in their composition and structure both between and within societies; and these variations change with time (Bolt and Bird, 2003; Chen and Dunn, 1996; Ambreen, 2013).

Earlier analyses of households were done under the unitary framework where households have a single utility function. In this framework, the household consists of individuals who combine their time, goods purchased, and goods produced at home to maximise a common utility (Quisumbing and Maluccio, 2000). Thus, the household is treated as a single production or consumption unit where all dynamics of decision-making within the household are assumed away and usually a single (presumably male) decision-maker takes all the decisions. Under the unitary model, the distribution of income/assets or other measures of

autonomy/bargaining power within the household (holding all else constant) does not affect outcomes (Doss, 2013). However, the unitary model of the household has been shown to be inappropriate for household analysis under different circumstances; and initial studies that tested the assumptions of this model recognised that they do not always hold. These initial studies found evidence suggesting that allocation of resources within the household affect outcomes of household decisions (Reggio, 2011). Thus, if household members have different preferences, then the existence of multiple voices, gender interest and an unequal distribution of resources in the household should be considered.

The evidence against the unitary model led to the development of the collective household model which allows for preferences to differ among household members. These models assume that the household's resource allocations are Pareto efficient. This implies that re-allocation of resources cannot make any household member better off without making someone else in the household worse off. In addition, in collective models, there is sharing rule which allows for different preferences of household members, but this rule can be affected by outside factors (Doss, 2013). Thus, unlike the unitary model, the collective model allows different decision makers to have different preferences; and also these models do not require a unique household welfare index or utility function, since the welfare index is dependent on prices, incomes and tastes (Chiappori, 1992).

The collective models can be grouped into: cooperative bargaining models and non-cooperative bargaining models (Quisumbing and Maluccio, 2000; Doss, 2013). Co-operative models assume that household members have free choices and any decision that each member makes is based on the utility to be derived from it. Under this model, each household member has bargaining power and this power is dependent on outside options of the members. This outside option is the welfare that each member would get if he or she is not a member of that household. The availability of outside options for individuals implies that policies that change these options will affect the bargaining power of household members and this, in turn, will affect outcomes from decisions made based on these bargaining powers. For instance, a cash transfer made to women may increase their bargaining power and this may affect the household's decision on child related outcomes.

The co-operative collective model has been grouped into two main categories. The first category assumes that households' decisions are the outcomes of bargaining power. This

bargaining power allows each household member to push for their preferences; but they do this by comparing their current position to the fall-back position, since the household is likely to break-up if no agreement is reached (Ambreem, 2013). Thus, households' decisions are made based on who gains and who loses most should the household break-up (Haddad, 1994). The second category is the co-operative conflict model. Unlike the co-operative bargaining model, the co-operative conflict model assumes that the perceived roles and obligations of household members result in differences in preferences; and this perceived differences in roles and obligations result in conflict resolution (Ellis, 1998). The Maternal Altruist model, which puts more social pressure on women to lower their needs to those of other household member, is an example of co-operative conflict model (Bolt and Bird, 2003). The Maternal Altruist model suggests that when women earn their own income, they invest more in their children because there are little or no opportunities for investment elsewhere (Devereux, 2001).

Non-cooperative collective models are less common in the literature than co-operative models (Bolt and Bird, 2003). These models usually do not assume that households' resource allocation leads to Pareto efficiency in either production or consumption (Doss, 2013). Becker's Super-Trader household model (Becker, 1981) is an example. Some studies (Udry, 1996; McPeak and Doss, 2006) use the non-cooperative models to test the assumptions of the co-operative models. For instance, Guatemala, Katz (1995) finds that each household member spends his/her earnings and transfers to fulfil his or her own preferences and responsibilities. Individuals have different preferences and the realisation of these preferences is based on their bargaining power or autonomy in the household. Hence, factors that determine a mother's bargaining power is important for the outcomes of decisions made in the household. For instance, an increase in women's autonomy undermines patriarchal family structure, reduces son-preference, and increases the opportunity costs of having children (Mutharayappa, 2014).

Theoretically, women's autonomy or bargaining power has been found to be influenced by four main sets of determinants: (1) control over resources such as assets; (2) factors that influence the bargaining process; (3) mobilisation of interpersonal networks; and (4) basic attitudinal attributes (Quisumbling and Maluccio, 1999). Women's participation in economic activities and their control over economic resources have been the main focus for women empowerment in the economic literature (Quisumbling and Maluccio, 1999; Khan, 2013).

One of the earliest studies (Engels, 1884) advocates for policies that increase women's participation in the labour market, since that is a sure way to empower them and liberate them from the restrictions imposed by patriarchal norms. This view has been supported in the literature in recent times as women who worked outside the household have increased level of autonomy relative to those who do not work (Anderson and Eswaran, 2009; DFID, 2007; Safa, 1992; Rahman and Rao, 2004).

However, women's labour market participation decision in itself is influenced by the bargaining powers within the household or women's autonomy in the household. Hence, different measures of women autonomy or bargaining power exogenous to their labour supply have been used in the literature. These measures include assets ownership (Doss, 1996; Thomas, Contreras and Frankenberg, 1997; Quisumbing 1994); unearned income (Schultz 1990; Thomas 1990), transfer payments or welfare receipts (Lundberg, Pollak and Wales, 1997; Rubaclava and Thomas, 1997); assets at marriage (Thomas, Frankenberg, and Contreras, 1997); and current assets (Doss, 1996). Ownership of these economic resources increases one's bargaining power or autonomy in the household because the threat to withdraw oneself and his/her resources may have an adverse effect on the welfare of the other household members. However, as noted by Quisumbling and Maluccio (1999), this threat is credible only if it is supported by norms or divorce laws.

In addition to women's control over economic resources, factors such as legal rights of spouses in marriage, social norms, skills and knowledge of each spouse, their educational level and their capacity to acquire information tend to influence the bargaining process. Though some of these factors, such as legal rights and social norms, may be external to the individual; the majority of the factors that influence the bargaining process are internal to the individual and many of these factors are related to one's human capital or educational level (Quisumbling and Maluccio, 1999). For instance, education has been found to influence one's bargaining power with the more educated spouse more likely to make decisions in the household (Elder and Rudolph, 2003); so the educational level of a spouse affects his or her bargaining power (Lührmann and Maurer, 2007). In Ghana, when a wife is more educated than her husband, the former has more power to assert her preferences in the allocation of the household's resources (Thomas, 1994).

Thirdly, memberships in organisation, access to one's kin and other social networks; as well as one's social capital may positively influence a person's power to affect household decisions. Thus, individuals can increase their bargaining power or autonomy by increasing their social networks or having others extended family members' support, either financially or socially. In Bangladesh, for instance, the assurance of a brother's support to his sister seems to increase the latter's economic value in her household; thus, most women give up their share of land inheritance for such supports (Subramanian 1998). Lastly, a woman's self-esteem, self-confidence and other attitudinal attributes also affect her bargaining power or autonomy in the household (Quisumbling and Maluccio, 1999). Hence, most Non-Governmental Organizations (NGOs) use legal awareness, political participation, and contraceptive use to empower women (Schuler et al., 1997). In conclusion, in addition to women's control of economic resources, the strong cultural traits prevalent in developing countries may directly or indirectly influence women's decision-making power or autonomy in the household as these affect their capacities, social networks and their self-worth in households (Khan, 2014).

Empirical Literature

Empirical papers on bargaining power and child welfare can be grouped into those that examine the correlation between bargaining power in the household and child related outcomes; and those that analyse the causal relationship between these two variables. In the case of the former, a woman's bargaining power is seen as an exogenous variable or the possibility of endogeneity in the estimation is ignored. As such, her bargaining power is measured by different proxies and its effects estimated directly in the outcome equation. On the other hand, papers that examine the causal relationship use institutional or policy changes, experimental and instrumental variable approaches to examine the effect of a woman's bargaining power or autonomy on child-related outcomes.

Thomas (1990) examined the effect of unearned income on child health outcomes. Using survey data on family health and nutrition in Brazil, he showed that mother's unearned income has a bigger impact on family's health than the effect of unearned income under the control of the father; and in the case of the probability of child survival, the effect is almost twenty times bigger. He also found evidence of gender preferences as mothers devote more resources to improve the nutritional status of their daughters, while fathers to their sons.

Similar results were found in the US, Brazil and Ghana where mothers were found to allocate more resources to daughters, while fathers channelled their resources toward sons (Thomas, 1994). Hou and Ma (2013) examined the effect of women's bargaining power on uptake of maternal health services with the Pakistan Social and Living Standards Measurement Survey. A woman's decision-making power was constructed from four questions about household expenditures on food, clothing, medical treatment and recreation. A woman has decision-making power on a particular issue if she makes decisions jointly with husband or by herself. They found that women's decision-making power has a significant and positive correlation with maternal health services uptake after controlling for socio-economic indicators and supply-side conditions.

In terms of studies on bargaining power and child labour and/or schooling, Galasso (1999) analysed the effect of intra-household bargaining power on child labour and schooling in Indonesia. Using transfers at marriage and assets brought to marriage as proxies for parents' bargaining power; she found that an increase in a mother's bargaining power is associated with a lower probability of child labour and greater schooling. Also, Ahmed and Ray (2011) examined the effect of bargaining power among parents on child labour and schooling with the Bangladesh National Child Labour Survey data of 2002. Using fathers' and mothers' level of education as a measure of bargaining power, they found that parents do not have identical preferences towards boys' and girls' schooling decisions. Specifically, the education of both mother and father shifts the trade-off towards girls' schooling, as opposed to engaging in market work, but the differential impact of mother's education on girls is significantly larger.

Establishing the causal effect of women's bargaining power on child related outcomes has been difficult since women's bargaining power is determined in the household; and, as such, it is not exogenous. Most studies rely on policy or institutional changes that are exogenous to the household to examine how such changes affect child related outcomes. One of the earliest studies is Lundberg et al. (1997). They studied the impact of the change in the UK Child Benefit policy of the 1970s that resulted in a substantial shift in child allowance from fathers to mothers. Using family expenditure survey data, they found that this policy change resulted in an increase in expenditure on women's clothing and children's clothing.

Furthermore, Rangel (2006) analysed the effect of the 1994 change in Brazil's law that extended alimony rights of couples living in consensual uniform or informal marriage. He used household surveys conducted before and after the change in the law; and formally married couples as comparison group. He found that the extension of the alimony rights of women in informal marriage which is associated with their outside options, and hence their bargaining power, increase these women's leisure hours and school attendance of their oldest daughters. In addition, Deininger et al. (2010) studied a change in inheritance law in 1994 in two Indian states: Maharashtra and Karnataka. They examined the effect of this change in inheritance law which gave daughters and sons equal right to family lands on educational attainment of girls. Using 2006 nationally representative Rural Economic and Demographic Survey (REDS) they employ a difference-in-difference estimation strategy. They found that the change in the inheritance regime had a positive impact on women's educational attainment as girls who started their education after the amendment had 0.3 years more of elementary education in 2006.

In addition, changes in other economic indicators or resources that households do not have control over have also been used to measure women autonomy. For instance, Qian (2008) investigated the effect of an exogenous increase in female income due to post-Mao agricultural reforms in China that resulted in an increase in price of tea (crop traditionally grown by women) and an increase in price of orchard based crops (crops cultivated by men) on sex-differential survival of children. The sex ratios and educational attainment of boys and girls in cohorts born in tea planting communities is compared to those in non-tea planting communities before and after the agricultural reforms. She found that increasing female income improves survival rates for girls, whereas increasing male income worsens survival rates for girls. Also, increasing female income increases educational attainment of all children, whereas increasing male income decreases educational attainment for girls and has no effect on boys' educational attainment. Similarly, Duflo (2003) and Jensen (2004) used the fact that the eligibility criteria for participation in the South African Old Age Pension Programme was discontinuous at age 60 for women and 65 for men to examine the effect of this income on child nutrition. The result from comparison of children's health status in households with an eligible elder to those without eligible elder showed that pensions receive by women had a larger effect on the anthropometric measures of girls, with little effect on boys. However, income that goes to men had no effect. Thus, the change in women's bargaining power led to positive outcomes for children.

Few studies have used the experimental approach to examine women's bargaining power. One of them was in Mexico. Bobonis (2009) used the fact that participating in the Mexican PROGRESA was randomised to estimate its causal effect on the measure of women's wellbeing which is measured by the household's expenditure share on adult female clothing. Using early phase-in households as treatment group and late phase-in as control, he found that increases in income to women have substantial positive effects on expenditure shares in children's clothing as well as adult female clothing expenditures.

Reggio (2011) investigated the causal relationship between mothers' bargaining power and child labour in Mexico with an instrumental variable approach. Using data from the Mexican Family Life Survey (MxFLS) of 2002, he measured mothers' bargaining power with their control over household asset. Mothers' ownership and participation in decision making processes related to household assets show their bargaining power in the household. He used the difference in husband's and wife's ages, and sex ratio as instruments for women's bargaining power or autonomy. These findings revealed that an increase in the mother's bargaining power has a negative impact on the hours of work of her daughters, but not her sons.

Similar conclusion was reached by Ambreen, (2013) when she explored the effects of a mother's decision-making power on her child's schooling and labour decision in Pakistan. She used data from Pakistan Social and Living Standards Measurement Survey (PSLM) conducted in 2007-08. Employing an instrumental variable approach, she focused on a subsample of women in the age group 15-49 years who were married and lived with their husbands and also have children aged between 10 to 14 years. The women's bargaining power is measured with an index constructed from five questions relating to women's participation in decision making on employment, purchases of household food and clothing, taking of medical treatment and recreation decisions. Following Reggio (2011), she used difference between husband and wife's ages; and difference between education attainment levels between women and men as instruments in estimating women's bargaining power in the first stage regression. The results show that mothers' bargaining power has highly significant and negative effect on child labour. Also, an increase in a mother's bargaining power increases her children probability of enrolling in school.

Apart from child related outcome, other studies have examined the impact of women's bargaining power on other household decisions. For example, Brown (2003) used the size of a woman's dowry as a measure of her bargaining power and investigated how it affects the intra-household allocation of time between household chores and leisure and the share of household spending that goes to women's goods. The author instrumented for dowry with regional grain shocks in the year preceding marriage and sibling sex composition of the bride and groom. The result indicated that higher dowries are associated with more potential leisure time for wives. In addition, Osmani (2007) studied the impact of participation in microcredit programme (which is a measure of bargaining power) in Bangladesh on land and non-land asset ownership. Osmani (2007) used the size of household labour force, number of dependents and principal occupation of the household as instruments for participation in microcredit programme. He found a significant and positive effect of bargaining power on land ownership.

In summary, the review of the literature suggests that intra-household distribution of decision making power can have different impacts on investment in children. In addition, the literature seems to suggest that girls benefit more from resource allocation when their mothers have higher bargaining power, and this is true for boys and their fathers. However, there are few studies on women's autonomy and child labour and schooling particularly in SSA. The few studies that examine impact of women's autonomy on child labour and schooling either ignore the possibility of endogeneity in the estimation or concentrate on the extensive margin of child labour and school enrolment. This chapter extends the literature on bargaining power and child welfare by using a non-economic measure of mother's autonomy to establish its effect on schooling and labour market participation, as well as hours spend in school and the labour market.

4.3. Methodology

4.3.1 Data

The data used in this chapter comes from a nation-wide survey conducted in 2010 by the Economic Growth Centre (EGC) of Yale University and the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana. This survey is the first wave of an on-going longitudinal survey of individuals, households and communities in Ghana. The

survey uses household and community, as well as districts and municipal assemblies' questionnaires. The household module provides data on demographic characteristics, employment, education, migration, health and fertility, power relations for men and women, household expenditure and housing characteristics, asset ownership, psychology and social network, as well as child module (health, digit test, raven test, maths test, English test) for the 10 regions of Ghana. The community questionnaire documents a broad range of natural and institutional features of the community, including political organisations, financial institutions, the presence of various development programmes, and community infrastructure.

A two-stage stratified sample design was used for the survey with the stratification based on the regions of Ghana. The first stage involved random selection of 334 Enumeration Areas (EAs) or geographical clusters from the 10 regions of Ghana using an updated master sampling frame constructed from the 2000 Ghana Population and Housing Census. The number of EAs for each region was proportionately allocated based on estimated 2009 population share for each region; however, EAs for Upper East and Upper West regions were over sampled to allow for a reasonable number of households to be interviewed in these regions. After this, a complete household listing was conducted in 2009 in all the selected clusters to provide a sampling frame for the second stage selection of households. The second stage of the selection involved a simple random sampling of 15 of the listed households from each selected cluster to ensure adequate numbers of completed individual interviews so that estimates for key indicators at the regional level can be undertaken with acceptable level of precision.

This 2010 survey is not a self-weighting sample design because disproportionately larger samples from regions with smaller populations were drawn; so each household did not have the same chance of selection into the survey sample. Hence, household sample weights are computed to reflect the different probabilities of selection into the sample in order to obtain the true contribution of each selected EA in the sample based on the first and second stages of selection. This is to facilitate estimation of the true contribution of each selected cluster in the sample.

In total, 5,010 households were sampled and 5,009 households from 334 Enumeration Areas (EAs) were completely interviewed. Thus, 15 households were selected from each of the 334

EAs. From the 5,009 households, 18,889 individuals or household members were interviewed. Since this chapter examines the effect of mothers' bargaining power or autonomy on children's participation in school and labour market, it focuses on a separate section of the household module that deals with power relations for men and women. This section of the questionnaire applies to men and women aged 12 years and above. Moreover, since this chapter focuses on the effects of a mother's decision-making power or autonomy on her children, the sample is restricted to all women aged 18 years and above living with their partners and children. Thus, children (persons less than 18 years) of women who are either married or in consensual union and living in the same households form the sample for this study. Table 4.1 shows the sample size of the data for this chapter.

Table 4. 1 Sample Size

Indicators	**Total**
Total Enumeration Areas	334
Total Households	5,009
Total Individuals	18,889
Target Households: Women living with their spouses and children	1,950
Children (persons less than 18 years) in target households	5,985

From table 4.1, the study sample comprises of 1,950 women (18 years and above) who are either married or are in consensual unions and are staying with their spouse(s) and have children who were less than 18 years. In these households, there are 5,985 children and these children form the sample for the analysis of mothers' autonomy on schooling in this study.

4.3.2 Construction of Mothers' Bargaining Power Index

The power relation module of the household questionnaire contains questions related to intra-household power relationship between men and women. Five questions that measure bargaining power or autonomy are selected to construct an index of bargaining power or autonomy. Specifically, the five questions that both men and women were asked are:

1. The important decisions in the family should be made only by the men of the family
2. A wife has a right to express her opinions even when she disagrees with what her husband is saying

3. When a wife has earned some money she has the right to spend it on herself or her children without asking her husband
4. A wife's partner frequently tries to limit her contact with her family members
5. A wife's partner insists on knowing where she is at all time

The answers to these questions are categorised as: agree which takes the value of 1; or disagree which takes the valve of 0. This study uses the responses provided by the men[31] instead of the women. Thus, the answers provided to the above questions by the spouse of a woman are used to construct her bargaining power or autonomy index, since man's responses to such questions have been found to provide a more accurate measure of a woman's autonomy in a household (Chakraborty and De, 2011). Also, from the above questions, agreement with questions 2 and 3 indicate an increase in a woman's autonomy, while an agreement with statements 1, 4 and 5 shows a decrease in a woman's autonomy or bargaining. For this reason, these responses are coded to ensure that a higher value signifies a higher autonomy or bargaining power. Thus, for statements 1, 4 and 5 disagreement takes the value 1; while agreement to these statements is coded 0.

Principal Component Analysis (PCA) is used to determine the weights that each response should carry. PCA is a statistical tool for identifying patterns in data, and expressing the data in such a way as to highlight their similarities and differences by reducing the number of dimensions. It transforms a set of possibly correlated variables to a set of linearly uncorrelated variables called principal components or indices. Each component is a linear weighted combination of initial variables that captures the common patterns. Hence, with five questions whose answers are used to construct a mother's bargaining power (MBP) or her autonomy; their linear combinations are given by:

$$MBP_1 = a_{11}X_1 + a_{12}X_2 + a_{13}X_3 + a_{14}X_4 + a_{15}X_5 \quad (1)$$

$$MBP_2 = a_{21}X_1 + a_{22}X_2 + a_{23}X_3 + a_{24}X_4 + a_{25}X_5 \quad (2)$$

$$MBP_3 = a_{31}X_1 + a_{32}X_2 + a_{33}X_3 + a_{34}X_4 + a_{35}X_5 \quad (3)$$

$$MBP_4 = a_{41}X_1 + a_{42}X_2 + a_{43}X_3 + a_{44}X_4 + a_{45}X_5 \quad (4)$$

$$MBP_5 = a_{51}X_1 + a_{52}X_2 + a_{53}X_3 + a_{54}X_4 + a_{55}X_5 \quad (5)$$

[31] As a form of robustness check, responses provided by the women are used later in this chapter

Where $a_{11}\ldots\ldots a_{55}$ are the weights. These weights are the eigenvectors of the correlation matrix or they are eigenvectors of the co-variance matrix if the original data are standardised. The eigenvalue of the corresponding eigenvectors is the variance for each principal component or the percentage of variation in the total data explained. Under the PCA, the transformation ensures that the first principal component explains the largest variation in the data subject to the constraint that the sum of square weights is equal to 1. Each succeeding component is uncorrelated with the previous and it, in turn, explains the highest variation in the data among the remaining components and is subject to the same constraint; but each explains smaller and smaller proportions of the variation of the original variables. For instance, the second component (PC_2) is completely uncorrelated with the first component, and explains additional, but less variation than the first component, subject to the same constraint. The eigenvalues equal the number of variables (*n)* in the initial data set (in this case it is five), the proportion of the total variation in the original data set accounted by each principal component is given by λ_i/n, where λ_i is the total variation.

With PCA, the higher the degree of correlation among the original variables in the data, the fewer the components required to capture common information; hence the first three components are used to measure mother's bargaining power or autonomy, since they explain about 80 percent of the variability in the data. Also, under PCA, the variables with low standard deviations usually would carry a low weight (McKenzie, 2003). For instance, in the case of this study, a question which all households agree or no household agrees (no standard deviation) would exhibit no variation between households and would be zero weighted. The PCA is applied because it is expect that the weight attached to the indicator questions will differ.

4.3.3 Descriptive Statistics

Schooling

As stated earlier, this chapter considers the schooling of children aged three to seventeen years (3-17 years)[32] living with their parents. Overall, 3,767 children within this age group were surveyed and out of this 96 percent of them are enrolled in school. School enrolment rates in the urban centres are 2 percentage points higher than those in the rural areas (95

[32] The section on education in the questionnaire applies to persons three years and above; and also in Ghana children are persons below the age of eighteen.

percent) as depicted in table 4.2. This high enrolment rate is not surprising since GER in the country is relatively higher, particularly at the primary level. In terms of gender, boys and girls school enrolment rates are 96 percent and 95 percent respectively. Generally, children spend about six hours per day in school. Therefore, with five days of schooling, they are supposed to spend 30 hours per week in school. However, from table 4.2, on average children's weekly hours of class attendance is 22 hours.

Table 4. 2 Enrolment Rate and Weekly Hours of Attendance by Location and Gender

	Enrolment		Class Attendance	
	Number	%	Number	Weekly Hours
Location: Rural	2730	0.95	2574	22.4
Urban	1037	0.97	1006	21.55
Gender: Boys	1993	0.96	1913	22.23
Girls	1774	0.95	1685	22.05
Total	**3767**	**0.96**	**3513**	**22.15**

Table 4.3 shows that a little over half (52 percent) of the children in the sample are boys, and the average age of a child in the sample is nine years. As far as household head characteristics are concerned, as much as 99 percent of households are headed by males; and they have an average age of 46 years. In addition, on average, seven people constitute a household, and the average number of children in a household is about four. In terms of the standard of living of these households, the average annual per capita expenditure is about GH¢516 with an average asset index of 0.05. Also, 77 percent of these households own farmland; and lastly, only 23 percent of these households are located in urban centres.

Table 4. 3 Descriptive statistics of the Sample

Variable	Mean	Std. Dev.	Min	Max
Child Characteristics				
Age	8.77	4.95	3	17
Boys	0.52	0.5	0	1
Head Characteristics				
Male	0.99	0.11	0	1
Age	45.56	12.22	15	100
Household Characteristics				
Land ownership	0.77	0.42	0	1
Per Capita Expenditure	515.47	381.05	101	5666.21
Household size	6.8	2.68	2	20
Number of children	4.08	2.17	1	15
Asset Index	0.05	1.05	-2.26	2.03
Located in urban area	0.23	0.42	0	1
Sum of couples Age	83	21.38	3	172

Child Labour

From table 4.4, a total of 1,666 households are engaged in farming and out of these, 1,346 and 320 are found in rural and urban areas respectively. Among these farming households, 41 percent of them (685) engage in child labour. Whereas 47 percent of farming households in rural areas use children on their farm, only 16 percent of those in urban centres engage in such practice. Though child labour participation rate in rural areas is higher than in urban centres, the intensity of work done by urban children is higher than their counterparts in rural areas. Specifically, the weekly hours of farm work done by children is about 3 hours less in rural areas than in urban areas, where children work for approximately 20 hours per week.

Table 4. 4 Child Labour and Weekly Hours of Work by Location and Gender

	Farming	Child Labour		
	Number	Participation	%	Weekly Hours
Location: Rural	1346	633	0.47	16.99
Urban	320	52	0.16	19.83
Total	**1666**	**685**	**0.41**	**17.21**

The average age per child in these farming households is about 7 years (see table 4.5), which is slightly lower than the average age per child in the entire sample (see table 4.3). In

addition, the proportion of households headed by male (0.85) and the average age of a household head (44 years) are lower among this sub-sample than the main sample.

Table 4. 5 Descriptive Statistics of Farming Households

Variable	Mean	Std. Dev.	Min	Max
Average Age of children	7.33	3.95	0	17
Male Head	0.85	0.12	0	1
Head Age	44.25	12.67	15	100
Land ownership	0.71	0.45	0	1
Per Capita Expenditure	593.04	437.97	91	5666.21
Household size	5.59	2.13	2	20
Number of children	3.02	1.71	1	14
Asset Index	0.03	1.02	-2.26	2.03
Located in urban area	0.19	0.45	0	1
Sum of couples Age	81.18	22.55	3	172

In terms of household characteristics, the average annual per capita expenditure is GH¢593; and, on average, a farming household consists of 6 members with about 3 of them being children. Also, from table 4.5, 71 percent of these households own farmland. This is not surprising since, in Ghana, farming can be done on rented lands or through a share cropping system where farmers cultivate on other people's lands and share the produces with them. Finally, 19 percent of these households are located in urban areas with the remaining found in rural areas.

Mothers' Autonomy

As indicated earlier, this study assesses a woman's autonomy with an index constructed from responses given by their spouses to five questions. Table 4.6 presents the five main indicators or questions used in constructing the autonomy index and the responses given by women and men.

For the first indicator, whereas 46 percent of women agree that important decisions in the family should be made by only men, about 51 percent of men agree with this statement. Secondly, whereas 84 percent of women believe that a wife has the right to express her opinion even when she disagrees with what her husband is saying, a lower percentage of men (73 percent) agree with this. When a wife has earned some money, more women (47percent) compared to men (34percent) agree that she has the right to spend it on herself or on her

children without asking her husband. In addition, though only 29 percent of women agree that their husbands try to limit their contacts with family members, 33 percent of men say they try to limit their wives contact with family members. Lastly, the proportion of women who agree (58percent) that their partners insist on knowing where they are at all time, is less than the proportion of men who agree (62percent) to the same indicator.

Table 4. 6 Decision Making Indicators

		Women	Men
	Responses	%	%
Important Decisions in the family should be made only by men of the family	Agree	45.6	50.56
A wife has the right to express her opinions even when she disagree with what her husband is saying	Agree	84.18	72.85
When a wife has earned some money she has the right to spend it on herself or her children without asking her husband	Agree	46.57	34.32
A woman's partner frequently tried to limit her contact with her family	Agree	28.63	33.16
A woman's partner insists on knowing where she is at all time	Agree	58.23	61.81

The remaining percentages refer to those that disagree with the above statements.

From table 4.6, women seem to have more autonomy if one consider the responses given by them vis-à-vis the responses by men. Men's responses tend to give an accurate measure of the level of autonomy of their wives (Chakraborty and De, 2011), since, in Ghana and other patriarchal society, men are mostly the heads of households. As stated earlier, this study uses the responses provided by the men in the construction of the autonomy index of mothers. Thus, the autonomy index shows the degree of autonomy husbands or partners are actually willing to grant to their wives (Chakraborty and De, 2011). Table 4.7 shows the summary statistics of all the five indicators, as well as the eigenvalues and weights assigned to each of the indicators in generating the index. The highest and lowest weights are respectively associated with decisions about limit of a woman's contact with her family (0.58) and a woman's right to spend her earned money on herself and on her children without asking her husband (0.23).

Table 4. 7 Summary of Indicators Use in Mothers' Autonomy Index

Indicator	Mean	Std Dev	Eigenvalues	Weights
Important decisions in the family should not be made by only men	0.49	0.5	1.96	0.38
A wife has the right to express her opinions even when she disagree with her husband	0.73	0.44	1.17	0.43
A wife has a right to spend her earned money on herself or her children without asking her husband	0.34	0.47	0.9	0.23
A woman's partner does not frequently try to limit her contact with her family	0.67	0.47	0.63	0.58
A woman's partner does not insist on knowing where she is at all time	0.38	0.49	0.33	0.53

4.3.4 Estimation Strategy

Empirical Model

Recent studies have shown that parents have different preferences with respect to demand for children's products; and, as such, resource allocation in the household may be done to settle the difference in preferences (Emerson and Souza, 2007; Ambreem, 2013). This settlement of parents' preference depends on their relative bargaining power autonomy. Hence, this chapter uses the collective model of the household (Chiappori 1988, 1992) as a foundation to examine the effect of a mother's bargaining power on her children's schooling and child labour decisions. Unlike the unitary model that assumes that parents have the same preference and maximise a single utility function, the collective model of the household assumes that a household maximises a weighted average of the wife's and husband's utilities, where the weights capture each parent's bargaining power or their effectiveness in the decision-making process (Basu and Ray, 2002).

Under this model, each parent has a separate utility function and the household maximises a weighted average of these utilities. Maximisation of these utilities subject to both the income and time constraints will yield a system of demand functions for schooling and child labour. Following Ahmed and Ray (2011), the demands for schooling (S_i^*) and child labour ((H_i^*) can be written as:

$$S_i^* = f(\mu, Z) \quad (6)$$

$$H_i^* = f(\mu, Z) \quad (7)$$

Where Z represents individual, household and community characteristics that affect the household utility and μ is the weight on the mother's utility function and it is a measure of her bargaining power and $\mu\epsilon[0,1]$. Based on equations (6) and (7) and assuming a linear relationship the dependent and the explanatory variables, the empirical equations to be estimated are:

$$S_{ih} = \beta_0 + \beta_1 MBP + \beta_2 ChildC + \beta_3 HeadH + \beta_4 HHc + \beta_5 COC + \varepsilon_i \quad (8)$$

$$H_h = \alpha_0 + \alpha_1 MBP + \alpha_2 ChildC + \alpha_3 HeadH + \alpha_4 HHc + \alpha_5 COC + \varepsilon_i \quad (9)$$

From equations (8) and (9), S_{ih} is the schooling status of a child *i* in household *h;* and this is measured in two forms: school enrolment and hours of school attendance. In terms of school enrolment, S_{ih} equals to 1 if a child was enrolled in school the previous year and he or she is still in school, otherwise 0; and, in terms of class attendance, S_{ih} is the weekly hours of school attendance. H_h represents measurements of both extensive and intensive margin of child labour. H_h equals to 1 if a household *h* uses children for farming activities or exchanges children to work on other people's farms, otherwise 0. In terms of intensive margin of child labour, H_h is the number of hours per week that a child works on a farm.

$ChildC$ refers to the child specific characteristics which have been found to influence schooling and child labour. They include a child's gender, age and age square (Lancaster and Ray, 2005; Bhalotra 2007). For the impact of mothers' autonomy on child labour, the average age of a child in a household and the proportion of boys in a household are used since the analysis is at the household level. A child's participation in child labour is expected to increase with his/her age since older children are stronger relative to younger children, and they may earn higher income than the later. Similarly, it is hypothesized that a child's school enrolment status will increase with age. In addition, it is expected that this relationship between a child's time use and his/her age to be non-linear, hence the inclusion of age square. In terms of the gender of the children, this study expects school enrolment and child labour to increase and decrease respectively if a child is male. This is based on the studies in Ghana

that have shown that girls are more likely to engage in child labour, but less likely to attend school (Blunch and Verner, 2000; Nielsen, 1998; Canagarajah and Coulombe, 1998).

$HeadH$ and HHc represent characteristics of the household head and the household respectively. The head of the household's gender, household size, household's annual per capita income (measured by annual per capita expenditure), number of children in the household (persons less than 18 years) and ownership of farmland are included in both schooling and child labour regressions. In terms of community characteristics (COC), the location (rural or urban) of the household is included in the estimation to capture differences in labour and schooling markets.

The main parameters of interest in this study are β_1 and α_1 which capture the impact of a mother's bargaining power (MBP) on her children's schooling and child labour respectively. A mother's bargaining power is measured by the autonomy index explained above. A mother's bargaining power is expected to impact positively on her children's schooling; but it should have a negative effect on her children's engagement in the labour market. These expectations are based on the collective model outlined above, which assumes that schooling provides both parents with positive externalities. So, as the mother's bargaining power increases, her demand for schooling also increases. On the other hand, child labour is a 'bad consumption good' that gives both parents disutility; thus, an increase in bargaining power of a parent (in this case the mother's bargaining power) reduces child labour.

Endogeneity of the Mother's Bargaining Power

One potential issue that may affect the estimation of equation (8) and (9) is that the mother's bargaining power in the decision making process may not be exogenous. Specifically, it may be influenced by many variables both observables and non-observables; hence estimating these equations by probit or Ordinary Least Square (OLS) model may lead to biased and inconsistent estimates. This issue has been recognized by recent studies. For instance, Roushdy and Namoro (2007) argue that parents' bargaining powers in the decision making process is determined by several factors, such as their individual and households characteristics as well as social norms; hence, it is endogenously determined. Men and women have different preferences regarding their children's welfare. These preferences are influenced by many factors, such as the gender of the child, his or her age, and even the

number of children they have. In addition to these factors, an individual's power in a decision making process is influenced by factors that are unobservable. Women who contribute more income to the household are more likely to have greater power; however, this higher income contribution may be influenced by factors that cannot be observed such as her ability.

Furthermore, the endogeneity in the bargaining power and decision-making outcomes may result from 'reverse causality'. As noted by Basu (2006), literature examining the impact of bargaining power or autonomy on decisions made often ignores the opposite effects of these decisions on bargaining power. Sometime the decisions made may in turn influence a mother's bargaining power or autonomy. For instance, the decision to engage in work outside the home may influence a woman's income which, in turn, may grant her higher bargaining power or autonomy. To account for the possibility of endogeneity in the mother's bargaining power or autonomy variable an instrumental variable approach is used to estimate equations (8) and (9). Specifically, they are estimated with two stage least square models (2SLS). Firstly, the autonomy index is assumed to be exogenous; and then a test for endogeneity is carried out in both equations before the 2SLS estimation method is applied.

Instrumental variable approach requires that variables that serve as instruments must correlate with the endogenous variable (that is mother's bargaining power), but have no direct effect on the outcome variable (child labour and schooling). Thus, factors that affect distribution of power within the household but have no direct impact on household behaviour. The so called distribution factors used in previous studies include (i) difference between husband and wife's ages (ii) difference between husband and wife's years of schooling and (iii) sex ratio (number of men verses female) in the community (Reggio, 2011; Ambreem, 2013). Following these studies (Reggio, 2011; Ambreem, 2013), difference in years of schooling of the spouses; and the sex ratio in the district where the woman resides are used as distribution factors in the first stage estimation.

It is expected that a woman's bargaining power or autonomy in a household is lower if the difference in years of school is higher. This is because more educated women may have better outside opportunities for jobs, and their withdrawal from the household may have adverse effects on all members; hence, they may be given higher bargaining power or

autonomy by their partners. Sex ratio[33] is defined as the number of men within a specific age group over the number of women in the same age group in a district. Sex ratio has been found to be one of the important determinants of intra-household bargaining power (Chiappori, Fortin and Lacroix, 2002), since it reflects the relative supply of men and women in the marriage market (Reggio, 2011). It follows then that the lower the sex ratio (that is when there are more females than males in the community) the lower the autonomy of women.

These distribution factors (sex ratio and differences in years of schooling) should not have direct effects on the outcome variables (child labour and schooling). Arguably, households do not consider the district sex ratio when deciding to send their children to school and/or work (Reggio, 2011). Also, the difference between the educational levels of parents is likely to affect these decisions only through its influence on bargaining power in the household as they determine whose preference with regard to investment in the children holds (Ambreem, 2013). Therefore, the first stage estimation equation can be written as:

$$MBP = \delta_0 + \delta_1 D + \delta_2 X + \varepsilon \quad (10)$$

Where MBP is the mother's bargaining power or autonomy index, D represents the distribution factors that affect household behaviour through the mother's bargaining power (that is the difference in years of school of the couple; and sex ratio); and X is a vector of factors that affect the decision making directly. These factors include the gender and age of a woman's children, gender of the household head, household size, number of children in the household, sum of the couples age, annual per capita income of the household, asset index of the household, ownership of farm land, durable asset index and location of the household.

In the second stage, both the decision for a child to participate in the labour market and school, as well as the number of hours that he/she spends in school and the labour market are estimated. Thus, from equations (8), (9) and (10), the second stage equations are:

$$S_{ih} = \beta_0 + \beta_1 \widehat{MBP} + \beta_2 ChildC + \beta_3 HeadH + \beta_4 HHc + \beta_5 COC + \varepsilon_i \quad (11)$$

$$H_h = \alpha_0 + \alpha_1 \widehat{MBP} + \alpha_2 ChildC + \alpha_3 HeadH + \alpha_4 HHc + \alpha_5 COC + \varepsilon_i \quad (12)$$

[33] Since in Ghana children are persons below the age of eighteen, the sex ratio is the number of men over the number of women at the district using 5 years interval beginning from persons within the age ranges 18-22 years followed by 23-27 years etc. There were 170 districts in Ghana in 2010.

Where $\widehat{MBP}$ is the mother's bargaining power or autonomy estimated from the first stage regression. $HeadH$ and HHc represent characteristics of the household head and the household respectively. COC is a vector of community variables that are likely to affect child labour and schooling. All other variables are as defined above; detail description of these variables is found in table C1 at the appendix.

4.4. Main Results and Discussion

This section discusses the regression results, starting with the determinants of mothers' decision making autonomy, and then the impacts of mothers' autonomy on schooling and child labour.

4.4.1 Determinants of Mothers' Autonomy or Bargaining Power

Most studies on women autonomy or bargaining power rely on their access or control over economic resources to measure autonomy since it is difficult to get good indicators of non-economic autonomy and valid instruments for such indicators. As stated earlier, mothers' autonomy is constructed from five indicators that show women's abilities to take certain decisions and act on their own. Table 4.8 show the first stage regression results where mothers' bargaining power or autonomy is the dependent variable.

From table 4.8, sex ratio has a significant and positive influence on bargaining power of women in both the overall sample and the subsamples. The positive relationship between sex ratio and mothers' autonomy implies that as the number of men (women) in a district increases (decreases), the autonomy of women increases. This result confirms prior expectation of a positive relationship between sex ratio and mothers' autonomy made. As noted by Angrist (2002), an increase in the sex ratio may increase a woman's bargaining power in the marriage market, thereby increasing her autonomy in the household. This may be possible because more men in the marriage market imply that a woman can get out of a marriage that prevents her from being independent and enter into another marriage easily.

Generally, Ghanaian men have higher education (more years of schooling) than women (GSS, 2014a). Therefore, differences in the years of schooling between the man and his wife/partner were included in the estimation and the result shows that differences in education significantly increase a woman's bargaining power. This implies that the higher

the difference in the educational levels of the spouses, the higher the autonomy of the woman. This result contradicts prior expectation that the higher the difference in education between spouses, the lower the woman's autonomy. This expectation is based on the fact that one requires some information in order to make certain decisions, and women with higher education can access such information and engage effectively in the household's bargaining process. However, it is also possible that women may benefit indirectly from the education of their spouses, since more educated men may know the importance of allowing their wives to be autonomous; hence, the observed positive relationship between these variables.

Table 4. 8 Determinants of Mother's Autonomy or Bargaining Power

Variables	All	Rural	Urban
Sex Ratio	0.109**	0.170**	0.670***
	(0.0443)	(0.0683)	(0.234)
DiffYrSch	0.0298***	0.0244***	0.0434***
	(0.00360)	(0.00402)	(0.00761)
Age	0.0216	0.0221	0.0279
	(0.0170)	(0.0184)	(0.0406)
Age2	-0.00923	-0.00849	-0.0148
	(0.00869)	(0.00939)	(0.0208)
Boy	0.0627**	0.0604**	0.0811
	(0.0279)	(0.0302)	(0.0678)
Ownland	-0.0130	-0.0962	0.0929
	(0.0456)	(0.0607)	(0.0734)
MaleHead	-0.615***	-0.551***	-1.111***
	(0.160)	(0.195)	(0.281)
HHsize	-0.0265*	-0.0441***	0.0123
	(0.0141)	(0.0153)	(0.0337)
NoChildren	0.0397***	0.0189***	0.0897**
	(0.0172)	(0.00186)	(0.0429)
Pcexphh	0.0129***	0.00123**	0.00124
	(0.0047)	(0.00053)	(0.00091)
Urban	0.266***	-	-
	(0.0450)	-	-
AssetIndexHH	0.0371**	0.00417	0.103***
	(0.0157)	(0.0136)	(0.0362)
CoupleAge	0.0277***	0.0360***	-0.0150
	(0.00733)	(0.00771)	(0.0208)
Observations	4,746	3,691	1,055
F-Statistics	30.11	27.39	24.76
Prob. F-test	0.00	0.00	0.00
R-squared	0.216	0.218	0.204

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

In addition to these two factors, the results indicate that a child's age does not have any significant effect on a woman's bargaining power; however, having a male child (boy) significantly increases a woman's bargaining power in the overall sample and rural subsample. This result is not surprising since, in Ghana, a male child is 'valued' more than a female child and, as such, women who are able to give birth to boys may have more power in the household than their counterparts with girls. Also, having a male head influences a woman's bargaining power negatively. Thus, women tend to have lesser autonomy when the household is headed by a man. In addition, the sum of ages of the couple also has a positive effect on women's autonomy in the overall sample and rural subsample; but it has no effect in the urban subsample Thus, a rural woman has a higher bargaining power when she and her husband are older. Furthermore, if a household owns farmland, then a woman's bargaining power reduces in the overall sample and the rural sub-sample; but farmland ownership has no significant effect on the autonomy of women in the urban sub-sample. This result may be due to the fact that in rural areas, farmlands are important productive inputs for farming, which is the major economic activity in such areas, and they are usually owned by men. Hence, women with little or no access to such productive input may have lower autonomy.

Lastly, a household asset index is significantly and positively related to a woman's bargaining power for the overall sample and urban subsample; but it has no effect in the rural subsample. This result is confirmed by the positive relationship between mothers' autonomy and households' annual per capita income. This means that the wealthier the household, the higher the bargaining power or autonomy of women. In addition, women in households with more people have lower autonomy relative to those with smaller households' size. Also, an increase in the number of children that a woman has increases her autonomy in the family. Traditionally, children are important outcomes of marriage. They tend to guarantee the continuous existence of the marriage. As such, women who cannot have children may have lesser bargaining power in the marriage market and the family since their partners may divorce them due to their childlessness. Living in an urban area increases the bargaining power or autonomy of women. Thus, women in urban areas have higher autonomy relative to their counterparts in rural areas. This may be because women in urban centres are more likely to have access to education and employment opportunities which might enhance their autonomy.

4.4.2 Impact of a Mother's Autonomy on Schooling and Child Labour

Now, this section examines the impact of mothers' decision making autonomy on their children's schooling and child labour. For each outcome, the mothers' autonomy variable is first treated as exogenous and either probit (for school enrolment and child labour participation) or tobit (for hours of class attendance and child labour) regression is ran. Then, the possibility of endogeneity of mothers' autonomy variable is considered and 2SLS regression with robust standard errors is carried out. All tables report the marginal effects of these estimations.

Impact on Schooling

Tables 4.9 and 4.11 present the marginal effects of the impact of mothers' bargaining power on children's school enrolment and weekly hours of class attendance respectively; while tables 4.10 and 4.12 show the results when the sample is split by the gender of the child. In tables 4.9 and 4.11, columns 1, 3 and 5 respectively show the probit results, while columns 2, 4 and 6 show the IV-probit results (2SLS) for the overall, rural and urban samples. For tables 4.10 and 4.12 columns 1 and 2 show the impact of mothers' autonomy on these outcomes for boys, while columns 3 and 4 give the results for girls.

Enrolment

Before these results are discussed, it is important to look at the results of the diagnostic tests on the instruments. This is so because though instrumental variable (IV) estimation may be used to solve the problem of endogeneity of a regressor, IV estimates tend to have poor statistical properties and may perform worse than Ordinary Least Square (OLS) estimates when invalid and weak instruments are used (Stock, Wright and Yogo, 2002).

The post estimation diagnostic tests show that mothers' autonomy is endogenous in all cases (tables 4.9 and 4.10). This is indicated by the significant Wald tests[34]. Also, the tests of over-identifying restrictions[35] show that the instruments used in this study are valid, since the tests are statistically insignificant in all cases. Finally, overall, the partial R squared results are a bit low suggesting the need for caution as far as instruments weakness is concerned.

[34] The Wald test for exogeneity is performed in this case since ivprobit was used in the estimation.

[35] STATA does not have the post estimation commands for ivprobit and ivtobit to test the validity and weakness of instruments, so the ivregress command is used instead. The results are similar to the above results (see tables C2-C4 in the appendix). Hence, these post-estimation tests are from the ivregress estimations.

However, the F statistic results for the joint significance of the instruments excluded from the structural model are all considerably larger than the rule of thumb value of 10 (Stock, Wright and Yogo, 2002). The instruments, hence, do not seem to be weak.

From table 4.9, a mother's autonomy has a significant and positive impact on school enrolment of her children. This positive relationship between mothers' autonomy and school enrolment is true for the overall sample as well as the sub-samples. However, for both the overall sample and the subsamples, the impact of mothers' autonomy on school enrolment is higher in the IV models relative to the probit models. These results suggest that ignoring the endogeneity of mothers' autonomy variable underestimate its true impact on school enrolment. This result supports earlier study on mothers' bargaining power and child labour in rural Senegal where the OLS estimates were lower than the IV estimates (Lépine and Strobl, 2013).

Women's bargaining power increases the likelihood of a child's school enrolment by approximately 28 percentage points (IV estimate) for the overall sample. In addition, it increases school enrolment rate of rural children by 32 percentage points and that of urban children by 12.5 percentage points only. However, a unit increase in mothers' autonomy increases school enrolment by only 3 percentage points in the overall sample, 3.2 percentage points for the rural subsample, and 1.4 percentage points in the urban sub-sample when endogeneity is not accounted for. This result seems to suggest that increasing women's decision making power is very important for improvement in school enrolment particularly in rural areas. This positive relationship between mother's autonomy and school enrolment may be due to the fact that most indirect costs associated with schooling, such as preparing and transporting children to and from school, are borne by the mothers. These costs are very important, especially at the basic level of education, where the direct costs are relatively lower[36]. The result from this study is consistent with a study in Pakistan that showed that an increase in women's bargaining power positively affects school enrolment (Ambreen, 2013).

[36] This is the case because about 90 percent of children in our sample are at the basic level of education; and about 80 percent are in public schools where direct cost of schooling is lower due to the Education Capitation Grants.

Table 4. 9 Impact of Mothers' Bargaining Power on School Enrolment

	All		Rural		Urban	
Variables	Probit	IV-Probit	Probit	IV-Probit	Probit	IV-Probit
MBP	0.031***	0.28***	0.032***	0.32***	0.0142*	0.125**
	(0.00665)	(0.0337)	(0.00831)	(0.0396)	(0.0081)	(0.0602)
Age	0.111***	0.083***	0.122***	0.08***	0.07***	0.07***
	(0.00782)	(0.0111)	(0.00947)	(0.0148)	(0.0108)	(0.0121)
Age2	-0.05***	-0.04***	-0.05***	-0.04**	-0.03***	-0.03***
	(0.0040)	(0.0053)	(0.0048)	(0.0062)	(0.0055)	(0.0063)
Boy	0.0300**	0.081***	0.0172	-0.00485	0.06***	0.0535**
	(0.0131)	(0.0135)	(0.0158)	(0.0153)	(0.0191)	(0.0221)
Ownland	-0.07***	-0.048**	-0.12***	-0.049**	-0.0107	-0.0256
	(0.0218)	(0.0227)	(0.0326)	(0.0036)	(0.0216)	(0.0264)
MaleHead	0.0274	-0.147**	0.0535	-0.16***	0.0122	-0.123
	(0.0630)	(0.0739)	(0.0822)	(0.0908)	(0.0668)	(0.107)
HHsize	-0.017**	-0.00674	-0.02***	-0.00633	0.0138	0.0120
	(0.00684)	(0.0071)	(0.0083)	(0.0088)	(0.0117)	(0.0139)
NoChildren	-0.07***	-0.04***	-0.04***	-0.05***	-0.22***	-0.13***
	(0.0082)	(0.0082)	(0.0099)	(0.0093)	(0.0137)	(0.0172)
Pcexphh	0.008***	0.0025	0.012***	0.00413	0.0023	0.00098
	(0.0025)	(0.0026)	(0.0030)	(0.0031)	(0.003)	(0.0031)
Urban	0.127***	0.293***	-	-	-	-
	(0.0216)	(0.0293)	-	-	-	-
AssetIndexHH	-0.03***	-0.03***	-0.03***	-0.02***	0.0119	0.000487
	(0.00642)	(0.00624)	(0.00755)	(0.00751)	(0.0106)	(0.0130)
CoupleAge	-0.0295	-0.088**	-0.0029	-0.099**	-0.147**	-0.139**
	(0.0356)	(0.0353)	(0.0417)	(0.0416)	(0.0588)	(0.0667)
Observations	4,746	4,746	3,691	3,691	1,055	1,055
Log pseudolikelihood	-2503.04	-9029.96	-2122.06	-7016.65	-364.347	-1947.93
Pseudo R2	0.276		0.1852		0.1749	
Exogeneity Test						
Wald Test: Chi2		32.01		23.2		14.5
Prob>Chi2		0.0000		0.0000		0.0038
Overidentifying Test						
Score Chi2 (ODT)		0.334127		0.035265		0.266011
P-valve		0.5632		0.8510		0.6060
Test of Weak Instruments						
Partial R-Square		0.0251		0.0216		0.0297
Robust F		36.3206		20.4153		17.7578
Prob>F		0.0000		0.0000		0.0000

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

Other variables in the estimation show interesting results that are worth mentioning. For instance, the relationship between age and school enrolment is non-linear. In addition, the results from both the IV probit and probit estimations show that being a boy has a positive influence on the probability that a child will be enrolled in a school in the overall sample and urban subsample; but it has no influence in the rural subsample. Also, it emerges that parent age and having a male as the head of the household are negatively associated with school enrolment in the overall sample and sub-samples. A household's ownership of farm land is associated with a reduction in the likelihood of going to school in the overall sample.

Furthermore, household size has a negative and significant association with schooling in the overall sample and rural subsample; but this association disappears once mothers' autonomy is instrumented for. In addition, having more children is associated with a reduction in the probability of school enrolment of these children; and this influence is larger in urban areas. This result is possible since schooling costs in urban centres are higher relative to such costs in rural areas.

Turning to households' wellbeing, it can be seen from table 4.9 that both households' annual per capita income and asset index have positive influence on school enrolment in the overall sample and rural subsample. Specially, an increase in a household's per capita income is associated with an increase in school enrolment of its children of 0.08 percentage point and 1.2 percentage points in the overall sample and rural subsample respectively; but these results become insignificant when mothers' autonomy are treated as an endogenous variable. In the case of household's wealth, a unit increase in households' asset index is associated with an increase in school enrolment of 3 percentage points for both the overall sample and rural subsample. Finally, children living in households that are located in urban areas are more likely to be enrolled in schools than their counterparts living in rural areas. Thus, the probability of school enrolment is about 30 percentage points higher for children in urban areas vis-à-vis those in rural areas.

The results are particularly revealing when the sample is split by the gender of the child. From table 4.10, a mother's bargaining power has a significant and positive impact on school enrolment of both boys and girls. A unit increase in a mother's autonomy increases girls' probability of enrolling in school by 31 percentage points; while it increases boys' school enrolment by only 26 percentage points. This result may imply that women care more about

their daughters than their sons when they have more bargaining power. This result is in line with studies in Bangladesh (Ahmed and Ray, 2011), where an increase in mothers' education (use as a proxy for bargaining power) has a larger impact on girls relative to boys; and in Brazil (Thomas, 1990), where an increase in women bargaining power results in bigger increases in the health and nutrition of girls relative to boys. Similar to above, the IV estimates are larger than those from the probit model.

The results for the other explanatory variables in table 4.10 are not very different from that of the main results (table 4.9) in terms of the significance and the signs. For instance, the age of a child has a non-linear relationship with school enrolment. Whereas the gender of household head has a statistically insignificant influence on school enrolment; a household's ownership of farm land is associated with a reduction in boys' probability of school enrolment, but has no influence on girls' schooling. Similar to the overall sample, an increase in the household size by one more person is associated with a reduction in school enrolment of boys and girls of 2 percentage points and 7 percentage points respectively. In addition, the probability of enrolling in school is associated with a reduction of about 4 percentage points for girls when one more child is brought to the household; however, the number of children in the household has no influence on boys' schooling.

Also, both per capita income and location in an urban area have a positive influence on school enrolment; but these influences become statistically insignificant when the endogeneity of mothers' autonomy variable is taken into account in the estimation. Finally, boys and girls in wealthier households (measured by the asset index) are more likely to enrol in schools than those in poor households. Having older parents is associated with a reduction in a boy's probability of school enrolment of 0.9 percentage points; and that of a girl of only 0.1 percentage points.

Table 4. 10 Impact of Mothers' Bargaining Power on School Enrolment by Gender

	Boys		Girls	
Variables	Probit	IV-Probit	Probit	IV-Probit
MBP	0.0405***	0.258***	0.0199**	0.308***
	(0.00881)	(0.0474)	(0.0100)	(0.0466)
Age	0.100***	0.0779***	0.123***	0.0871***
	(0.0103)	(0.0136)	(0.0119)	(0.0183)
Age2	-0.0435***	-0.0334***	-0.0576***	-0.0418***
	(0.00524)	(0.00653)	(0.00611)	(0.00882)
Ownland	-0.0977***	-0.0917***	-0.0399	-0.00559
	(0.0292)	(0.0312)	(0.0325)	(0.0329)
MaleHead	0.0478	-0.133	0.00389	-0.138
	(0.0840)	(0.0962)	(0.0954)	(0.115)
HHsize	-0.0248***	-0.0196**	-0.092***	-0.0677***
	(0.00950)	(0.00963)	(0.0101)	(0.0105)
NoChildren	0.00562	0.0114	-0.0203*	-0.0392***
	(0.0115)	(0.0116)	(0.0121)	(0.0120)
Pcexphh	0.0075***	0.00033	0.0084*	0.00193
	(0.0028)	(0.00035)	(0.0044)	(0.00412)
Urban	0.144***	0.0533	0.112***	0.00845
	(0.0288)	(0.0407)	(0.0325)	(0.0421)
AssetIndexHH	-0.0240***	-0.0239***	-0.0253***	-0.0249***
	(0.00856)	(0.00848)	(0.00957)	(0.00914)
CoupleAge	-0.00662	-0.00920*	0.00664	-0.00103*
	(0.00474)	(0.00472)	(0.0538)	(0.000541)
Observations	2,490	2,490	2,256	2,256
Log pseudolikelihood	-1264.3477	-4692.9436	-1229.3419	-4323.0249
Pseudo R2	0.1182		0.1013	
Exogeneity Test				
Wald Test: Chi2		16.45		15.04
Prob>Chi2		0.0001		0.0000
Overidentifying Test				
Score Chi2 (ODT)		0.671896		0.001658
P-valve		0.4124		0.9675
Test of Weak Instruments				
Partial R-Square		0.0192		0.0171
Robust F		25.8999		18.9373
Prob>F		0.0000		0.0000

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

Hours of Class Attendance

Enrolling children in schools is a first step toward improving their human capital; but their academic performance and other educational outcomes are highly linked to the number of

hours they spend in schools. Hence, the chapter examines the effect of mothers' autonomy in the household on the weekly hours of class attendance of children. Similar to the enrolment results, the post estimation tests show that a mother's autonomy variable is endogenous to weekly hours of class attendance for the overall sample and all subsamples except the urban subsample. This is given by significant of the Wald test of exogeneity ($p>0.05$) in table 4.11 and 4.12. Also, the over-identifying test and the F-statistics show that the instruments are valid and not weak.

From columns 1-4 of table 4.11, a mother's autonomy has a significant and positive impact on children's weekly hours of class attendance in the overall sample and rural sub-sample. However, in the urban sub-sample a mother's autonomy has no effect on the weekly hours of class attendance. Similar to the school enrolment estimates, the impact of mothers' autonomy on hours of class attendance is underestimated when the mothers' autonomy variable is assumed to be exogenous. Specifically, a mother's bargaining power increases hours of class attendance by approximately 1.7 hours and 4.3 hours for the tobit and IV-tobit models respectively in the overall sample. Among rural children, a unit increase in mothers' autonomy increases their hours of school attendance by 7.2 hours (column 4).

A child's age has statistically significant non-linear relationship with hours of class attendance for the overall sample and rural sub-sample, but it has no influence in the urban sub-sample. Whereas a child's gender does not have statistically significant association with hours of class attendance, the gender of the household head has a significant influence on hours of class attendance. Also, though living in an urban area has a positive association with school enrolment, location in an urban centre has a negative association with the number of hours of class attendance.

Also, an addition of one child to a household is positively associated with children's hours of class attendance and it increases the hour of schooling by about 1.4 in the rural subsample. Household asset index, an indicator of household wealth is associated with 1.4 hours reduction in the hours of class attendance in the rural sub-sample, but it increases class attendance in the urban subsample by the same magnitude. Moreover, ownership of farmland has negative association with children's hours of class attendance in the overall sample and rural subsample, but it has no influence on urban children. Finally, the age of the parent has a

negative influence on hours of class attendance in the rural sub-sample, but no influence in the overall sample and urban sub-sample.

Table 4. 11 Impact of Mothers' Bargaining Power on Class Attendance

	All		Rural		Urban	
Variables	Tobit	IV-Tobit	Tobit	IV-Tobit	Tobit	IV-Tobit
MBP	1.702***	4.324***	1.509***	7.222***	1.199	2.425
	(0.139)	(1.447)	(0.154)	(1.756)	(1.272)	(2.417)
Age	0.147	0.0771	0.269	0.0739	-0.108	-0.112
	(0.184)	(0.201)	(0.204)	(0.255)	(0.390)	(0.391)
Age2	0.00160	0.00415	-0.00646	0.000167	0.0194	0.0197
	(0.0092)	(0.0100)	(0.0102)	(0.0126)	(0.0197)	(0.0198)
Boy	0.0528	-0.260	0.148	-0.364	-0.126	-0.181
	(0.302)	(0.341)	(0.333)	(0.420)	(0.651)	(0.665)
Ownland	-1.253**	-1.38***	-2.02***	-1.685**	-0.216	-0.296
	(0.493)	(0.517)	(0.673)	(0.744)	(0.713)	(0.760)
MaleHead	-0.111	-3.387**	-2.989**	-6.33***	4.085**	3.332***
	(1.232)	(1.664)	(1.216)	(1.456)	(2.043)	(1.607)
HHsize	-0.247	-0.159	-0.253	0.0232	-0.354	-0.372
	(0.157)	(0.172)	(0.179)	(0.224)	(0.312)	(0.318)
NoChildren	1.336***	1.415***	1.420***	1.380***	-0.0724	-0.0133
	(0.188)	(0.208)	(0.213)	(0.255)	(0.409)	(0.440)
Pcexphh	0.00263	-0.00359	0.00742	-0.00454	-0.00597	-0.00674
	(0.0045)	(0.00559)	(0.00574)	(0.00743)	(0.00817)	(0.00848)
Urban	-1.64***	-2.69***	-	-	-	-
	(0.480)	(0.643)	-	-	-	-
AssetIndexHH	-1.17***	-1.31***	-1.31***	-1.39***	1.490***	1.416***
	(0.141)	(0.155)	(0.156)	(0.181)	(0.325)	(0.371)
CoupleAge	-0.0349	-0.0116	-1.09***	-1.02***	-0.0112	-0.0105
	(0.0805)	(0.0087)	(0.0884)	(0.0114)	(0.0196)	(0.0194)
Observations	3,569	3,569	2,613	2,613	956	956
Pseudo R2	0.261		0.25		0.26	
Exogeneity Test						
Wald Test: Chi2		7.4		13.19		0.19
Prob>Chi2		0.0065		0.0003		0.6595
Overidentifying Test						
Score Chi2 (ODT)		7.37745		1.6562		0.424943
P-valve		0.6600		0.1981		0.5145
Test of Weak Instruments						
Partial R-Square		0.014		0.0113		0.0174
Robust F		26.8607		19.324		22.627
Prob>F		0.0000		0.0000		0.0000

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

Table 4.12 shows the marginal effect of both the tobit and IV-tobit estimation of the effect of mother's bargaining power on weekly hours of class attendance of boys and girls. The results show that mothers' bargaining power significantly affects girls' weekly hours of class attendance, but has no effect on boys' class attendance. An increase in a mother's autonomy increases weekly hours of girls' class attendance by about 1.4 hours. This effect increases to 5.7 hours when the endogeneity of mothers' autonomy is taken into account. This result is consistent with an earlier study in Brazil which shows that an increase in a mother's bargaining power increases her children's school attendance, particularly girls (Rangel, 2006).

In terms of the other explanatory variables, a child's age is significant and positively associated with hours of class attendance for both boys and girls. While the relationship between age and class attendance is non-linear for girls, it is linear for boys. Furthermore, having a male head in a household has a positive and negative influence on hours of class attendance of both boys and girls respectively. This result seems to suggest that a child's hours of class attendance is more when his/her sex is the same as that of the mother or father. Thus, when a mother has more autonomy in the household, girls benefit; and boys benefit when a man is the head of the household. In addition, farmland ownership, asset index and household size have negative association with boys' hours of school attendance, but they do not affect girls' schooling.

For household location, the results show that both boys and girls living in urban areas have fewer hours of class attendance relative to their counterparts in rural areas. Living in an urban area is associated with a reduction in the weekly hours of class attendance of 3 hours for boys and 2.2 hours for girls. Also, whereas a household's annual per capita income has a positive association with the weekly hours of class attendance of girls, having older parents has the reverse effects on girls' class attendance; but both factors have no influence on boys' hours of class attendance. Lastly, households' wealth negatively influences boys' hours of class attendance, but it has no effect on girls.

Table 4. 12 Impact of Mothers' Bargaining Power on Class Attendance by Gender

	Boys		Girls	
Variables	Tobit	IV-Tobit	Tobit	IV-Tobit
MBP	0.246	2.796	1.386***	5.740***
	(0.185)	(2.025)	(0.208)	(2.168)
Age	1.189***	1.296***	1.308***	1.222***
	(0.242)	(0.255)	(0.285)	(0.320)
Age2	0.00862	0.0107	-0.0728***	-0.049***
	(0.0119)	(0.0126)	(0.0145)	(0.0162)
Ownland	-1.957***	-2.237***	-0.455	-0.207
	(0.643)	(0.689)	(0.762)	(0.840)
MaleHead	1.312***	3.329***	-1.66***	-2.964***
	(0.434)	(1.074)	(0.148)	(0.779)
HHsize	-2.406***	-1.415***	-0.0779	0.176
	(0.209)	(0.217)	(0.235)	(0.279)
NoChildren	1.514***	1.654***	0.146	0.0530
	(0.250)	(0.287)	(0.281)	(0.318)
Pcexphh	0.0253	-0.0689	1.033***	1.073***
	(0.0586)	(0.0681)	(0.0714)	(0.0948)
Urban	-2.250***	-3.030***	-1.998***	-2.157**
	(0.621)	(0.897)	(0.742)	(0.959)
AssetIndexHH	-1.336***	-1.380***	0.0152	0.287
	(0.180)	(0.189)	(0.222)	(0.265)
CoupleAge	0.00374	0.00119	-1.012***	-1.028***
	(0.0109)	(0.0111)	(0.0120)	(0.0142)
Observations	1,915	1,915	1,654	1,654
Log pseudolikelihood	-6914.10	-9624.49	-6007.85	-8343.92
Pseudo R2	0.26			0.15
Exogeneity Test				
Wald Test: Chi2		1.58		5.62
Prob>Chi2		0.0289		0.0177
Overidentifying Test				
Score Chi2 (ODT)		10.282		0.444858
P-valve		0.513		0.5048
Test of Weak Instruments				
Partial R-Square		0.0277		0.0205
Robust F		19.141		17.1494
Prob>F		0.0000		0.0001

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

Impact on Child Labour

This section analyses the impact of mothers' bargaining power on households' decision to use or exchange children for farming activities (extensive margin of child labour); as well as the number of hours (intensive margin of child labour) that such children work per week.

Unlike the schooling estimations, the sample could not be split by the location of the household since only few farming households are located in urban areas (only 52 urban farming households engaged in child labour). In addition, this analysis is at the household level. This makes it impossible to split the sample by the gender of the child. Table 4.13 reports the results of the impact of mothers' autonomy on both extensive and intensive margin of child labour.

Extensive Margin of Child Labour

Similarly, in estimating the impact of mothers' bargaining power on households' decision to engage children in farm work, both probit and IV-probit models are used. It is worth noting from column 2 of table 4.13 that the null hypothesis for the Wald tests of exogeneity is rejected. Therefore, mothers' bargaining power is endogenous. Also, the post estimation tests show that the instruments are valid and not weak.

From table 4.13, bargaining power of mothers has significant and negative impacts on child labour participation. A unit increase in a mother's autonomy reduces the probability of child labour on the farm by approximately 19 percentage points (IV-probit), all things been equal. This implies that when a mother has a voice in the decision making process of the household, she may influence the process, such that the likelihood of the household using or exchanging children for farming activities may be reduced. This result is consistent with studies in Bangladesh (Ahmed and Ray, 2011) and Pakistan (Ambreen, 2013) that find that an increase in women's bargaining power reduces children's participation in the labour market. This result may be explained by two factors. First, when mothers have more autonomy, especially access and control over their earned incomes, they may hire adult labourers to assist with farming activities instead of using children. Secondly, women have been found to be more altruistic. They prefer consumption goods that improve upon the welfare of all, particularly children. Men, in contrast, favour private consumption goods (DasGupta and Mani, 2015). Hence, when a woman has more autonomy in a household, she will choose more schooling and less child labour.

As far as the control variables are concerned, the average age of a child in a household has statistically significant and positive influence on the likelihood of child labour in farming. Thus, as a child grows older, his/her probability of engaging in child labour also increases.

Table 4. 13 Impact of Mothers' Bargaining Power on Child Labour

	Participation		Hours	
Variables	Probit	IV-Probit	Tobit	IV-Tobit
MBP	-0.0281**	-0.191***	-1.310***	-1.059
	(0.0140)	(0. 0122)	(0.207)	(4.435)
Average Age	0.0916***	0.0115***	1.156***	1.171***
	(0.00692)	(0.00708)	(0.102)	(0.136)
Average Age2	0.0102***	0.0118**	0.196***	0.212***
	(0.00573)	(0.00593)	(0.00806)	(0.0128)
PropBoys	-0.134***	-0.080***	0.166	0.0284
	(0.0167)	(0.0175)	(3.511)	(3.809)
Ownland	0.270***	0.203***	8.802***	8.851***
	(0.0113)	(0.0155)	(2.276)	(2.295)
HHsize	0.0244	0.0210	0.258	0.253
	(0.0151)	(0.0147)	(0.210)	(0.213)
NoChildren	0.0198***	0.0105***	1.131***	2.111***
	(0.00185)	(0.0080)	(0.0262)	(0.0287)
Pcexphh	-0.0109***	-0.0791***	-2.170***	-2.0160**
	(0.00414)	(0.00531)	(0.0671)	(0.0890)
Urban	-0.108**	-0.037***	-1.165	-1.887
	(0.0456)	(0.00751)	(0.777)	(1.972)
AssetIndexHH	0.0123	0.0131	0.172	0.180
	(0.0125)	(0.0120)	(0.194)	(0.205)
CoupleAge	0.0188***	0.0249***	1.0491***	1.0527***
	(0.00190)	(0.00188)	(0.0297)	(0.0373)
Observations	1,462	1,462	1,462	1,462
Log pseudolikelihood	-814.94696	-2802.6222	-3059.7953	-4704.0826
Pseudo R2	0.1781		0.106	
Exogeneity Test				
Wald Test: Chi2		1.45		0.03
Prob>Chi2		0.0282		0.8648
Overidentifying Test				
Score Chi2 (ODT)		0.025679		8.54008
P-valve		0.8727		0.0035
Test of Weak Instruments				
Partial R-Square		0.0094		0.0078
Robust F		16.5617		4.5091
Prob>F		0.0005		0.0112

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

The effect of average age on work gets stronger as a child grows older, since average age square has a positive relationship with child labour. A child's gender is statistically significant in explaining the likelihood of engaging in child labour as the proportion of boys in a household has a negative association with the probability of child labour. Furthermore,

parents' age has significantly positive influence on child labour. An increase in the parents' age by one year is associated with 2.5 percentage points increase in the probability of them using or exchanging their children for farming activities. Whereas household size has statistically insignificant influence on child labour, an increase in the number of children in the household positively influences child labour. Again, ownership of farmland is associated with 20 percentage points increase in the probability of child labour in farming. Households' annual per capita income and their location in urban areas have significantly negative association with the likelihood of children working on farms. Lastly, the probability that children in urban areas would engage in child labour is 4 percentage points lower than the likelihood for children in rural areas to engage in child labour.

Intensive Margin of Child Labour

Unlike the extensive margin of child labour, the post estimation diagnostic tests indicate that a mothers' bargaining power is exogenous since the Wald test of exogeneity is insignificant (column 4 of table 4.13). According to Cameron and Trivedi (2009), if the Wald test shows no endogeneity, then a non-instrumental estimation will suffice. Therefore, discussion on the impact of mothers' autonomy on hours of child labour is based on the results of the marginal effects of the tobit estimation. From table 4.13, a mother's bargaining power has a negative and significant effect on weekly hours of child labour in the tobit models. Specifically, a unit increase in mothers' bargaining power reduces children's weekly hours of work by 1.3 hours. This result is consistent with an earlier study in Mexico which shows that an increase in women's bargaining power leads to a fall in child labour hours particularly that of girls (Reggio, 2011). Thus, an improvement in a mother's autonomy in the household does not only prevent children from been engaged in farm works, but it reduces the number of hours that child labourers work in a week. Note, however, that this is not the case for the IV-tobit estimation, which shows a coefficient of similar magnitude, but insignificant effect.

Similar to child labour participation, the average age of a child in a household has a non-linear relationship with the number of hours of work that he/she undertakes. Unlike the extensive margin of child labour, the number of hours of works that child labourers do is not influenced by their gender since the proportion of boys in a household has no influence on hours of child labour. In addition, the age of a child's parents has a statistically significant and positive association with the number of hours of child labour. Again, it is evident from

table 4.13 that household farmland ownership has the largest influence on the number of hours of child labour. Child labourers in households that own farmland work 8.8 hours more than their counterparts from landless households. Also, an additional child to the household is associated with 1.1 hours increase in the intensity of farm work done by children. Finally, the number of hours of work undertaken by working children in farming is associated with 2.2 hours fall when the household's annual per capita income is increased by one Ghana cedis (GH¢1).

4.4.3 Robustness of the Results

To investigate the robustness of the results, the mothers' bargaining power index is constructed as an un-weighted sum of the responses provided to the five questions listed above. Thus, instead of using the PCA to assign weights to the five questions, the bargaining power or autonomy index is constructed as the sum of the responses provided to the five questions to check the sensitivity of the results. Hence, the un-weighted autonomy index ranges from zero to five with higher value signifying higher autonomy. Similar to the autonomy index constructed using the PCA approach, the mean autonomy or bargaining power of women is higher when one considers the responses given by women to the five questions relative to the responses given by men (see table C10 in the appendix).

The impact of mothers' autonomy on schooling (enrolment and hours of class attendance) and child labour (participation and hours of work) did not change when this un-weighted mothers' autonomy index is used. As evidenced in tables C5 and C6 in the appendix, mothers' autonomy has a positive impact on enrolment in both the overall sample and all subsamples. Also, an increase in mothers' bargaining power increases the hours of class attendance in the overall sample, rural and girls subsample, but it has no effect on boys and urban subsample (see tables C7 and C8 in the appendix). Finally, mothers' autonomy has a negative effect on child labour in farming, but no effect on hours of child labour when the autonomy variable is considered to be endogenous (table C9).

Furthermore, two separate Instrumental Variable (IV) regressions are carried out for each distribution factor. Thus, for each IV regression, mothers' autonomy is instructed with one distribution factor (i.e. either the district sex ratio or difference in years of school completed

between the husband and wife). The IV results, where mothers' autonomy is instrumented with only the difference in years of school completed between the husband and wife is similar to the main results (see tables C11-C13). Similar results are obtained when district sex ratio is used as the only instrument for mothers' autonomy with respect to the impact of mothers' autonomy on hours of class attendance (see table C15 in the appendix) and child labour (table C16). However, a slightly different result with respect to the impact of mothers' autonomy on school enrolment is obtained. Unlike the main results, mothers' autonomy has a positive effect on all children, rural children, boys and girls; but it has no effect on urban children's school enrolment (see table C14).

Finally, women's responses to the above questions were used to construct the autonomy index and separate regressions run for them. The results are similar to the ones obtained when their partners' responses were used (see tables C17-C22 in the appendix).

4.5. Conclusion and Policy Recommendations

Recent literature indicates that the household is not a homogenous entity and, in fact, parents have different preferences especially with regards to child products. Thus, who has much say in a household is very important for the welfare of the household, in particular for children. Empirical evidence from both developed and developing countries seem to suggest that children benefit most when their mothers have access to more economic resources relative to when such resources are in the hand of fathers. Hence, this chapter uses the collective model of the household to examine the effect of mothers' decision making autonomy on their children's schooling and labour supply in Ghana.

A woman's autonomy is not only about her economic capacity, which is defined by her access to resources, but also her freedom to act independently. Women's abilities to formulate choices, control resources and participate in decision making are all part of their autonomy (Adhikari, 2016). Thus, women's non-economic autonomy is also very important, since it defines who decides on how economic resources are used in the households. This has subsequent effects on the outcomes of households' decisions. Therefore, the chapter estimates, specifically, the relationship between the non-economic autonomy of mothers and their children's welfare (that is, school enrolment and attendance, intensive and extensive margins of child labour).

The autonomy of mothers is an index constructed by applying Principal Component Analysis to five questions regarding mothers' independence in the household; namely the ability to (1) express themselves; (2) take part in important decisions in the household; (3) spend their earned incomes on themselves and their children without consulting their partners; (4) have unlimited contacts with family members; and (5) to go anywhere without restrictions from partners or husbands. Using the 2010 nation-wide representative survey conducted by Yale University in collaboration with the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana, this chapter applies both non-instrumental estimation technique that assume that the mothers' autonomy variable is exogenous; and an IV estimation method to account for the possibility of endogeneity between mothers' autonomy measurements and child welfare indicators (schooling and labour supply). The district sex ratio and the differences in the years of schooling of the spouses are used as instruments to estimate mothers' autonomy.

The results show that a mother's autonomy is positively influenced by the sex ratio existing in the district that the mother resides. Thus, the more women (lesser men) a district has, the lower the autonomy of women, and vice versa. Also, the difference in years of schooling between a man and his partner, having a male child, having more children and residing in an urban area, all have a positive influence on mothers' autonomy in the household. In addition, women in wealthier households have more autonomy. This is indicated by the positive relationship between households' wealth (measured by annual per capita income and asset index) and women's autonomy. On the other hand, household's ownership of farm land and having a male household head both exert a negative influence on women's autonomy. Lastly, a woman has lesser autonomy when the household size is large.

The results from the impact of mothers' decision making autonomy on children's schooling show that the more autonomy a mother has, the higher the probability that her children will be enrolled in school. This positive relationship between mothers' autonomy and school enrolment is true for the overall sample and all sub-samples (rural, urban, boys and girls) for both the instrumental and non-instrumental estimation models. However, the impact of mothers' autonomy on school enrolment is vastly underestimated when the mothers' autonomy variable is assumed to be exogenous. In addition, girls tend to benefit more when their mothers' autonomy is increased relative to boys. Also, children in rural areas have a higher probability of enrolling in school relative to those in urban centres when there is an

increase in mothers' autonomy. In terms of class attendance, the results of this study show that mothers' autonomy positively impact on the weekly hours of school attendance for the overall sample, girls and rural subsamples; but it has statistically insignificant effect on boys and urban children. Thus, whilst boys have a higher probability of being enrolled in schools when their mothers have more autonomy or bargaining power in households' decision-making, their weekly hours of class attendance is not affected by their mothers' autonomy.

In addition, an increase in a mother's autonomy reduces the extensive margin of child labour in farming. Thus, the probability that a household will use or exchange a child for farming activities is reduced when the mother in the household has higher autonomy. In addition, the intensity of work undertaken by working children is negatively affected by mothers' autonomy. Hence, children who are already in the labour market tend to work for fewer hours when their mothers' bargaining power or autonomy is increased. Overall, these findings support the use of models that incorporate different preferences for household members and the treatment of mothers bargaining power or autonomy as an endogenous variable.

These results have strong policy implications. The study shows that the autonomy of mothers has a positive and a negative impact on schooling enrolment and child labour participation respectively. These results strongly suggest that policies and interventions, such as public education on gender equity in marriage and rights of women in relationships as well as the responsibilities of each partner in the relationship, may help to improve women's autonomy in the household. Also, as the results indicate, improvement in households' standard of living has a positive impact on women's autonomy. This implies that policies that reduce poverty are not only important for women's empowerment in relationships, but they may also help improve schooling and reduce child labour, particularly in farming. Hence, policies, such as the Livelihood Empowerment Against Poverty (LEAP) programme in Ghana, should be expanded and targeted at women. In conclusion, this thesis proposes that policies that legally protect the assets of women, such as changes in customary laws that would improve women's access to land, will go a long way to enhance their autonomy since the majority of rural women are engaged in farming.

CHAPTER 5: General Conclusion

5.1 Summary

Child labour is not only harmful to the physical and mental development of children, but it also impedes human capital formation. The fall in human capital development due to child labour further results in loss in Gross Domestic Product (GDP) and economic development. The adverse effects of work on the economies of developing countries and the 1999 Child Deterrence Act of the USA, which prohibits the importation of goods produced with child labourers, have made the elimination of child labour a top development priority for most countries that rely heavily on agriculture, including Ghana. This renewed interest in child labour and the devastating effects of this trade motivated this thesis on child labour and schooling in Ghana. This thesis examined the correlates of child labour and schooling and the effect of work on schooling in Ghana, as well as the impacts of Ghana's cash transfer programme (Livelihood Empowerment Against Poverty-LEAP) and mothers' bargaining power on these two child welfare indicators. This thesis consists of five chapters. The first chapter provides a general background on child labour and schooling in Ghana.

The second chapter of this thesis investigated the main correlates of child labour (both extensive and intensive margins of child labour) and schooling (enrolment and hours of class attendance) among Ghanaian children aged 5-17 years. Unlike previous studies, this chapter considered both children's engagement in 'normal' child labour and hazardous works. Also, this chapter examined the effect of child labour on hours of class attendance and adjusted years of schooling. The chapter used data from Ghana's 2013 Living Standard Survey and employed a bivariate probit and tobit model to examine the correlates of participation and hours respectively. The results show that there is a gender gap in both child labour and schooling in Ghana. Boys are more likely to enrol in schools relative to girls. The former is also less likely to participate in the labour market. In addition, parent education, household wealth and income of the family all have a negative and a positive effect on a child's likelihood of working and schooling respectively. Also, a child's likelihood of working increases and his/her probability of schooling falls when his/her parents are employed, the household owns livestock, distance to nearest school is far, child wage increases and schooling expenditure is higher. Furthermore, child labourers work for fewer hours when they are enrolled in school. Ownership of land, receipt of remittance, increase in household

income and wealth, as well as low school expenditure all lead to a reduction in the hours of child labour. Finally, the results in this chapter show that an additional hour of child labour is associated with 0.15 hour (9 minutes) reduction in class attendance. The effect is bigger for girls relative to boys. Also, one more hour of child labour increase the probability of a child falling behind in grade progression by 1.4 percentage points.

The third chapter estimated the impact of Ghana's Livelihood Empowerment Against Poverty (LEAP) cash transfer programme on educational outcomes (enrolment, attendance hours, repetition and test scores) and child labour in farming and non-farm enterprises. This chapter used the LEAP evaluation data collected in 2010 and 2012. It employed three quasi-experimental methods (propensity score matching (PSM), difference-in-difference (DD), and difference-in-difference combined with matching (MDD)) in its analysis. The discussion of the results, however, is based on DD combined with matching estimation (MDD) method, since this ensures that both observable and un-observational differences between LEAP recipients and non-recipients that are likely to affect both participation and the outcome variables are accounted for.

The results show that participation in the LEAP programme has no significant effect on school enrolment in the overall sample and subsample of girls and younger children aged 5-12 years, but it did increase enrolment rates of boys (2.7 percentage points) and older children aged 13-17 years (9.6 percentage points). In terms of class attendance, the programme had a positive and statistically significant effect on weekly hours of class attendance for the overall sample, boys and younger children (5-12 years); but the LEAP scheme had no effect on the hours of class attendance of girls and older children. For class repetition, the LEAP programme had a significant and negative impact in the overall sample, as well as boys and older children. Furthermore, the LEAP programme had no statistically significant impact on test scores (cognitive ability). Lastly, one of the possible channels through which the receipt of the LEAP cash would impact on education is through the scheme's effect on educational expenses. However, the results showed that the LEAP programme had no impact on school expenses for the overall sample and girls; but the scheme increased the total school expenditure of boys and older children (13-17 years).

With regard to child labour, the LEAP programme had no effect on the extensive margin of child labour in farming in the overall sample and all subsamples, except in female headed

households. However, participation in the LEAP programme reduced the daily hours of child labour on farms in the overall sample and all subsamples, except non-extremely poor households. The highest reduction in hours of farm work done by children occurred in female headed households. Lastly, unlike child labour in farming, the results show that the LEAP programme had no effect on both the extensive and intensive margins of child labour in non-farm enterprise in the overall sample and sub-samples. These results may have been possible because the LEAP scheme reduced farming among households and it had no effect on households' operation of non-farm enterprises.

The fourth chapter examined the impact of mothers' autonomy or bargaining powers in the household on their children's schooling and child labour in Ghana. The autonomy of mothers is an index constructed by applying Principal Component Analysis to five questions regarding mothers' independence in the household; namely the ability to express themselves; their participation in important decisions in the household; their ability to spend their earned incomes on themselves and their children without consulting their partners; their ability to have unlimited contacts with family members; and their abilities to go anywhere without restrictions from their partners. Using the 2010 nation-wide representative survey conducted in Ghana, the chapter used both non-instrumental estimation methods and instrumental variable (Two Stage Least Square-2SLS) approaches to account for the possibility of endogeneity between mothers' autonomy measurements and child welfare indicators (schooling and labour supply). In the 2SLS estimation, the district sex ratio and the differences in the years of schooling of the spouses were used as instruments to estimate women's autonomy variable. This estimated value was used in a second stage estimation of schooling and child labour decisions. Generally, the results show that the impact of mothers' autonomy on these child welfare indicators is vastly underestimated when the mothers' autonomy variable is assumed to be exogenous.

In addition, the results showed a positive and significant relationship between a mother's autonomy and her child's probability of enrolling in school. This positive relationship between mothers' autonomy and school enrolment holds for the overall sample and all sub-samples (rural, urban, boys and girls) in both the instrumental and non-instrumental estimation models. Girls tend to benefit more when their mothers' autonomy is increased. Also, children in rural areas have a higher probability of enrolling in school relative to those in urban centres when there is an increased in mothers' autonomy. In terms of class

attendance, the results show that mothers' autonomy positively impact on the weekly hours of school attendance for the overall sample, girls and rural subsamples; but it has statistically insignificant effect on boys and children in urban areas. In addition, an increase in a mother's autonomy reduces both the extensive and intensive margin of child labour in farming.

Overall, this thesis shows that child labour and schooling decisions are interdependent and work has a negative association with schooling. Both child labour and schooling decisions are influenced by child, parent and households characteristics which are linked to parents' income generating abilities, households' standard of living and the level of bargaining power of mothers in the decision making process in households. In Ghana, both child labour and schooling are weakly responsive to the Livelihood Empowerment Against Poverty (LEAP) cash transfer programme. However, child labour and schooling seem to be strongly affected by mothers' bargaining power in households. These results suggest that policies aimed at eliminating child labour and improving upon schooling should include empowerment of women to enhance their autonomy in the family. Lastly, the results seem to suggest that the LEAP programme should be re-designed to target extremely poor and female headed households.

5.2 Some Limitations of the Study

This thesis faced some limitations regarding data and measurement of variables. The first limitation is lack of data on child labour at the individual level. In chapters three and four of this study, the child labour variable was defined as households' use or exchange of children for farming activities. Though household level data may be used in certain economic analysis, in the case of child labour participation and hours of work, individual level data could have allowed for the disaggregation of the overall results by gender and age of children. In addition, the definition of child labour in farming used in these two chapters was limited to children below 15 years, because the dataset lacks information on the work status of children aged 15-17 years. Though, by the ILO definition, engagement of children below 15 years in any economic activity is classified as child labour, the data on works situation of children aged 15-17 years may have improved the analysis.

Moreover, women autonomy or bargaining power is difficult to measure (Goetz and Gupta, 1996). Women autonomy or bargaining power is a multi-dimensional concept which is affected by social, economic, political and cultural factors that are interconnected and subjective in nature. Recent studies have used women's asset shares and earnings as indicators of their autonomy or bargaining power, However, this was not the case in chapter four, since the question on asset ownership was asked at the household level and, also, there was no data on women's earnings since most of them are employed in the informal sector of the economy and, generally, people do not want to respond to questions on earnings. The analysis would have improved if data on women's access to economic resources were available, such that comparison on the effect of women's economic and non-economic bargaining power on child welfare indicators could be made. However, in the absence of these variables, women's autonomy or bargaining power was measured as an index constructed from five questions which measure their participation in households' decision making.

Lastly, the evaluation study of the LEAP programme in chapter three was done two years after the implementation of the scheme. Though two years may be long enough for the programme to have some impacts in the lives of beneficiaries, this duration may not be long enough to observe changes in the cognitive ability of children.

5.3 Suggestions for Future Research

It is worth noting that the limitations outlined above do not undermine the conclusions of this thesis. Rather, addressing these issues will improve the analysis. These limitations and results indicate the need for further research on child labour and schooling in Ghana. In particular, there is the need for further study on the LEAP programme after five or more years of implementation since the impact of cash transfer schemes accumulate over time. In addition, there is the need for future study to consider both economic and non-economic measures of women's autonomy or bargaining power. Finally, the results on the impacts of LEAP programme points to the need for further research on why the programme's largest impact occurred in female headed households. Future research may examine how distribution of bargaining power in households affects the impact of a cash transfer scheme (LEAP programme) in Ghana.

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APPENDIX

Table A 1-A10 Appendix for Chapter Two

Table A1. Variables Names and Definition

Variables	Definitions
Childlabour	1 if a child is involved in child labour in the last 7 days, 0 otherwise
HazardousW	1 if a child is involved in hazardous in the last 7 days, 0 otherwise
Enrol	1 if a child is enrolled in school last year and now, 0 otherwise
HoursCL	Hours of child labour per week
HoursH	Hours of hazardous work per week
ClassAtthrs	Hours of class attendance per week
Classmisshrs	Hours of missed class attendance per week
Homeworkhrs	Hours of homework (study) per day
Boy	1 if a child is a boy; 0 Otherwise (a girl)
RelH	1 if a child is the son/daughter of household head; 0 otherwise
Age	Child 's age
Age2	Square of a child's age
FatherHH	1 if a child's father is in the Household; 0 otherwise
MotherHH	1 if a child's mother is in the Household; 0 otherwise
FatherEmptsta	1 if the father is employed; 0 otherwise
MotherEmptsta	1 if the mother is employed; 0 otherwise
FatherEduPrim	1 if the father has completed primary school; 0 No education
FatherEduSec	1 if the father has completed post primary school ; 0 No education
MotherEduPrim	1 if the mother has completed primary school; 0 No education
MotherEduSec	1 if the mother has completed post primary school; 0 No education
Typesch	1 if a child's school is public; 0 if a child's school is private
LogTotalEduexp	Log of schooling expenditure per cluster
HeadAge	Age of household head
HeadAge2	Age of household head squared
MaleHead	1 if a household head is male; 0 otherwise
HeadMar	1 if a household head is married; 0 otherwise
NoChildren	Number household members below 18 years
Elders	1 if a household has members above 60 years; 0 otherwise
Ownland	1 if a household owns land; 0 otherwise
Remittance	1 if a household received remittance, 0 otherwise
Landsize	Farm size per household in acres
Ownlivestock	1 if a household owns livestock; 0 otherwise
HHsize	Number of persons in a household (household size)
RurUrb	1 if a household is located in urban area; 0 if it is in rural area
AssetIndex	Index of 40 durable assets based on Principal Component Analysis
LogExpCapita	Household expenditure per capita (in logs)
Scholarship	1 if the child has scholarship at school, 0 otherwise
Childwage	Wage per day per child in agriculture work in a community
DistPrimary	Distance to the nearest primary school in a community in kilometres
DistJHS	Distance to the nearest JSS in a community in kilometres

Table A2 Descriptive Statistics

	Boys		Girls		Total	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age	10.71	3.65	10.71	3.68	10.71	3.67
Age2	127.97	80.31	128.2	80.94	128.08	80.62
Age started work	8.82	2.59	8.91	2.67	8.86	2.63
Boy					0.51	0.5
RelH	0.8	0.4	0.76	0.43	0.78	0.41
Enrol	0.87	0.34	0.86	0.35	0.87	0.35
Economic Work	0.31	0.46	0.28	0.45	0.29	0.45
Childlabour	0.26	0.44	0.22	0.42	0.24	0.43
HazardousW	0.16	0.36	0.13	0.33	0.14	0.35
Homeworkhrs	0.74	0.44	0.81	0.39	0.78	0.42
ClassAtthrs	27.62	10.28	27.77	10.25	27.69	10.26
HoursCL	21.9	17.93	20.2	16.69	21.12	17.4
HoursH	27.76	21.13	24.89	20.02	26.48	20.68
Typesch	0.76	0.43	0.76	0.43	0.76	0.43
TotalEduexp	239.37	397.15	259.8	415.13	249.34	406.15
FatherHH	0.68	0.47	0.62	0.48	0.65	0.48
FatherEduPrim	0.62	0.48	0.57	0.5	0.6	0.49
FatherEduSec	0.24	0.43	0.27	0.45	0.26	0.44
FatherEmptsta	0.59	0.49	0.59	0.49	0.59	0.49
MotherEmptsta	0.51	0.5	0.49	0.5	0.5	0.5
MotherEduPrim	0.72	0.45	0.68	0.47	0.7	0.46
MotherEduSec	0.13	0.34	0.15	0.35	0.14	0.35
ExpCapita	413.69	628.44	445.15	681.1	429.13	654.98
MotherHH	0.8	0.4	0.78	0.42	0.79	0.41
HeadAge	48.36	13.16	48.33	13.48	48.35	13.31
HeadAge2	2512.2	1420.3	2517.31	1457.37	2514.71	1438.58
MaleHead	0.78	0.41	0.75	0.43	0.76	0.42
HeadMar	0.75	0.43	0.74	0.44	0.75	0.43
NoChildren	4.19	2.34	4.07	2.32	4.13	2.33
Elders	0.24	0.43	0.25	0.43	0.24	0.43
Remittance	0.04	0.19	0.03	0.18	0.04	0.19
Ownland	0.52	0.5	0.5	0.5	0.51	0.5
Landsize	6.68	54.44	5.92	30.31	6.31	44.27
Ownlivestock	0.61	0.49	0.58	0.49	0.6	0.49
HHsize	6.99	3.26	6.85	3.26	6.92	3.26
RurUrb	0.33	0.47	0.37	0.48	0.35	0.48
Childwage	3.04	5.63	3.18	6.17	3.1	5.89
DistPrimary	1.16	4.16	0.97	3.71	1.07	3.95
DistJHS	3.55	7.3	3.28	7.08	3.42	7.2

Table A3a Correlates of School and Labour Market Participation for Boys (Model 1)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
RelH	0.00328***	(0.00118)	-0.0436***	(0.0107)
Age	0.000413*	(0.000244)	0.00332	(0.00559)
Age2	-1.15E-04	(0.000109)	-0.000332	(0.000262)
FatherEduPrim	-0.00172	(0.00112)	0.0346***	(0.0126)
FatherEduSec	-0.00137	(0.000868)	0.0282***	(0.00963)
MotherEduPrim	-0.000768	(0.000643)	0.0335***	(0.0113)
MotherEduSec	0.000882	(0.000723)	-0.0230*	(0.0119)
FatherEmptsta	0.00817***	(0.00233)	-0.0961***	(0.0204)
MotherEmptsta	0.00893***	(0.00256)	-0.0924***	(0.0285)
FatherHH	0.000176	(0.000697)	-0.00221	(0.0108)
MotherHH	0.000786	(0.000634)	-0.0078	(0.00947)
HeadAge	-0.000049	(0.000056)	0.000826	(0.000843)
HeadAge2	0.000072	(0.000055)	-0.00012	(0.000076)
MaleHead	0.00206**	(0.000901)	-0.0310***	(0.00829)
HeadMar	-0.00163**	(0.000688)	0.0268***	(0.00561)
NoChildren	0.000043	(0.000128)	0.000336	(0.00209)
Elders	-0.000395	(0.000414)	0.00775	(0.00611)
Ownland	-0.00006	(0.000279)	0.000308	(0.00457)
Landsize	-0.00007	(0.00009)	0.000127	(0.000171)
Ownlivestock	0.000819*	(0.000418)	-0.00945*	(0.00564)
HHsize	-0.000009	(0.000094)	-0.000758	(0.00156)
RurUrb	-0.000423	(0.000357)	0.00538	(0.00532)
Remittance	-0.000682	(0.0007)	0.0145	(0.0105)
AssetIndex	-0.00031**	(0.00013)	0.00432***	(0.00136)
LogExpCapita	-0.00007	(0.000195)	0.00509	(0.0033)
LogTotalEduexp	-0.00024	(0.000279)	0.000394	(0.00472)
Rho	-0.28891	0.040201		
Wald Test, rho=0; chi2(1) Pro			45.9651	0.000
Log Pseudolikehood				-1756430
Sample			11,319	

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

Table A3b Correlates of School and Labour Market Participation for Boys (Model 2)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
RelH	0.00293***	(0.000883)	-0.0394***	(0.00952)
Age	-0.00092***	(0.000351)	0.0163***	(0.00366)
Age2	6.37e-05***	(0.0000197)	-0.0011***	(0.000164)
FatherEduPrim	-0.00425***	(0.0016)	0.0510***	(0.0137)
FatherEduSec	-0.00281**	(0.00121)	0.0326***	(0.0104)
MotherEduPrim	-0.000945	(0.000608)	0.0329***	(0.011)
MotherEduSec	0.00112	(0.000733)	-0.0235**	(0.0118)
FatherEmptsta	0.00675***	(0.00153)	-0.0830***	(0.0145)
MotherEmptsta	0.00521***	(0.0011)	-0.0558***	(0.0106)
FatherHH	0.00128	(0.000814)	-0.0149	(0.0114)
MotherHH	-0.000199	(0.000578)	0.00308	(0.00856)
HeadAge	-0.000128*	(0.000067)	0.00168*	(0.000884)
HeadAge2	0.0000014**	(0.0000006)	-0.00019**	(0.00008)
MaleHead	0.00175***	(0.000648)	-0.0265***	(0.00758)
HeadMar	-0.000894**	(0.000437)	0.0175***	(0.00537)
NoChildren	-0.000032	(0.000142)	0.001	(0.00208)
Elders	-0.000407	(0.000425)	0.00736	(0.0062)
Ownland	-0.000309	(0.000306)	0.00342	(0.00458)
Landsize	-0.00006	(0.00009)	0.000104	(0.000165)
Ownlivestock	0.000753**	(0.000374)	-0.00894*	(0.00519)
HHsize	0.000093	(0.000111)	-0.00172	(0.00154)
RurUrb	-0.000109	(0.000357)	0.00188	(0.00529)
Remittance	-0.00170**	(0.000818)	0.0246**	(0.011)
AssetIndex	-0.00040***	(0.000126)	0.00532***	(0.00143)
LogExpCapita	0.000297	(0.000198)	0.000156	(0.00337)
LogTotalEduexp	-0.000408	(0.000311)	0.00288	(0.00468)
DistPrimary	0.000329**	(0.000149)	-0.0042***	(0.000981)
DistJHS	0.000091*	(0.000058)	-0.0013***	(0.000502)
Childwage	0.000077	(0.000048)	-0.000886	(0.00065)
Rho	-0.22489	0.0482		
Wald Test, rho=0; chi2(1) Pro		20.1275	0.0000	
Log Pseudolikehood			-1022395	
Sample			6,731	

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

Table A4a Correlates of School and Labour Market Participation for Girls (Model 1)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
RelH	-0.0286***	(0.0102)	0.00194**	(0.00076)
Age	0.00708	(0.00664)	0.000703**	(0.000298)
Age2	-0.00064**	(0.00031)	-0.000207	(0.000128)
FatherEduPrim	0.0383***	(0.0134)	-0.0016	(0.000975)
FatherEduSec	0.0159	(0.0101)	-0.000847	(0.00067)
MotherEduPrim	0.0212*	(0.0114)	-0.00055	(0.000599)
MotherEduSec	-0.0024	(0.0108)	-0.000129	(0.00565)
FatherEmptsta	-0.0951***	(0.0197)	0.00881***	(0.00202)
MotherEmptsta	-0.105***	(0.027)	0.0104***	(0.00264)
FatherHH	0.0113	(0.0138)	-0.00093	(0.00756)
MotherHH	-0.0129	(0.0125)	0.00184**	(0.000809)
HeadAge	-0.00185*	(0.00112)	0.000137*	(0.0000779)
HeadAge2	0.000014	(0.000011)	-0.000011	(0.000007)
MaleHead	-0.0471***	(0.00876)	0.00273***	(0.000958)
HeadMar	0.0240***	(0.00677)	-0.0016***	(0.000577)
NoChildren	-0.00405	(0.00254)	0.000187	(0.00016)
Elders	0.00313	(0.00798)	-0.000847	(0.00462)
Ownland	0.00434	(0.00545)	-0.000161	(0.000318)
Landsize	-0.00017**	(0.00008)	0.000009	(0.000007)
Ownlivestock	-0.00181	(0.00588)	0.000274	(0.000349)
HHsize	0.00233	(0.00195)	-0.000104	(0.000119)
RurUrb	0.00596	(0.00606)	-0.000492	(0.000373)
Remittance	-0.0087	(0.0109)	0.000385	(0.000641)
AssetIndex	-0.00337**	(0.00134)	0.00022**	(0.000102)
LogExpCapita	-0.0029	(0.00398)	0.000473**	(0.000239)
LogTotalEduexp	0.0173***	(0.00616)	-0.00118**	(0.00048)
Rho	-0.23016	0.040218		
Wald Test, rho=0; chi2(1) Pro			30.4538	0.000
Log Pseudolikehood			-1856028	
Sample			10,941	

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

Table A4b Correlates of School and Labour Market Participation for Girls (Model 2)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
RelH	-0.0344*	(0.0197)	0.00231	(0.00148)
Age	-0.0237	(0.0161)	0.00099*	(0.000591)
Age2	0.000865	(0.00077)	-0.000024	(0.000027)
FatherEduPrim	0.0631***	(0.0234)	-0.00549*	(0.00292)
FatherEduSec	0.0372**	(0.0171)	-0.00369*	(0.0022)
MotherEduPrim	0.0123	(0.018)	-0.000761	(0.00118)
MotherEduSec	0.00959	(0.018)	-0.000437	(0.00123)
FatherEmptsta	-0.203***	(0.0382)	0.0127***	(0.00308)
MotherEmptsta	-0.244***	(0.0568)	0.0153***	(0.00395)
FatherHH	-0.0167	(0.0259)	0.00065	(0.00165)
MotherHH	-0.0205	(0.0207)	0.00102	(0.00125)
HeadAge	-0.000364	(0.00181)	0.000016	(0.000129)
HeadAge2	0.000006	(0.000017)	-0.000003	(0.000012)
MaleHead	-0.0607***	(0.0173)	0.00451**	(0.00183)
HeadMar	0.0324***	(0.0117)	-0.00235**	(0.00112)
NoChildren	-0.00728*	(0.00395)	0.000547	(0.000344)
Elders	-0.0169	(0.0148)	0.00109	(0.00113)
Ownland	0.00556	(0.0086)	-0.000481	(0.00063)
Landsize	-0.000089	(0.000171)	0.000075	(0.00011)
Ownlivestock	-0.0092	(0.0113)	0.000566	(0.00081)
HHsize	0.00510*	(0.003)	-0.000366	(0.000247)
Remittance	-0.00184	(0.0179)	0.000372	(0.00129)
AssetIndex	-0.00364	(0.00296)	0.000283	(0.000238)
LogExpCapita	-0.00981	(0.00653)	0.0006	(0.00045)
LogTotalEduexp	0.0398***	(0.0103)	-0.00280**	(0.0011)
DistPrimary	0.000827	(0.00159)	-0.000027	(0.000102)
DistJHS	0.0021***	(0.000667)	-0.00016**	(0.00008)
Childwage	-0.00134	(0.000884)	0.00008	(0.00008)
Rho	-0.13204	0.0525		
Wald Test, rho=0; chi2(1) Pro		6.1855	0.000	
Log Pseudolikehood			-944942	
Sample			6,160	

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

Table A5a Correlates of School and Labour Market Participation for Rural Children

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Boy	-0.000434	(0.000399)	0.00592	(0.0049)
RelH	0.00370***	(0.00118)	-0.0477***	(0.0129)
Age	0.000610*	(0.000366)	-0.00621	(0.00887)
Age2	-0.00014	(0.0017)	0.00087	(0.00431)
FatherEduPrim	-0.00464**	(0.00189)	0.0564***	(0.0153)
FatherEduSec	-0.00283**	(0.00134)	0.0328***	(0.0112)
MotherEduPrim	-0.00144	(0.00102)	0.0280**	(0.0128)
MotherEduSec	0.000222	(0.00093)	-0.00613	(0.0126)
FatherEmptsta	0.0142***	(0.00257)	-0.181***	(0.0301)
MotherEmptsta	0.0162***	(0.00313)	-0.205***	(0.0411)
FatherHH	0.00028	(0.00106)	0.000667	(0.0148)
MotherHH	0.00200**	(0.000995)	-0.0253*	(0.0135)
HeadAge	-0.00034	(0.000084)	0.00048	(0.0011)
HeadAge2	0.000038	(0.00078)	-0.00054	(0.00102)
MaleHead	0.00404***	(0.00124)	-0.0529***	(0.0107)
HeadMar	-0.00276***	(0.000857)	0.0360***	(0.00753)
NoChildren	0.000245	(0.000191)	-0.00308	(0.00255)
Elders	0.000297	(0.000608)	-0.00355	(0.00808)
Ownland	-0.00046	(0.000403)	0.00609	(0.0051)
Landsize	0.00003	(0.000774)	-0.00048	(0.00101)
Ownlivestock	0.000802	(0.000532)	-0.0104	(0.00661)
HHsize	-0.000129	(0.000143)	0.00157	(0.00197)
Remittance	-0.000157	(0.000892)	0.00183	(0.0118)
AssetIndex	-0.000310*	(0.00016)	0.00415**	(0.00182)
LogExpCapita	0.000433	(0.00027)	-0.00521	0.00408)
LogTotalEduexp	-0.00181***	(0.000583)	0.0233***	(0.00658)
Rho	-0.18275	0.03412		
Wald Test, rho=0; chi2(1) Pro		27.4113	0.000	
Log Pseudolikehood		-216012.4		
Sample		13,963		

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

Table A5b Correlates of School and Labour Market Participation for Rural Children

Independent Variables	Hazardous Work Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Boy	-0.000748	(0.000468)	0.00819*	(0.00493)
RelH	0.00319***	(0.00115)	-0.0349***	(0.0119)
Age	-0.00197***	(0.00054)	0.0216***	(0.00474)
Age2	0.000138***	(0.0000287)	-0.00151***	(0.000209)
FatherEduPrim	-0.00793***	(0.0023)	0.0727***	(0.0164)
FatherEduSec	-0.00461***	(0.00172)	0.0373***	(0.0119)
MotherEduPrim	-0.00200*	(0.00117)	0.0288**	(0.0125)
MotherEduSec	-0.00059	(0.00116)	-0.00398	(0.0127)
FatherEmptsta	0.00967***	(0.0015)	-0.106***	(0.012)
MotherEmptsta	0.0112***	(0.00157)	-0.122***	(0.0128)
FatherHH	0.000819	(0.00133)	-0.00892	(0.0147)
MotherHH	0.000789	(0.00106)	-0.00862	(0.0117)
HeadAge	-0.000179*	(0.000101)	0.00195*	(0.00108)
HeadAge2	0.00159*	(0.00928)	-0.00017*	(0.00001)
MaleHead	0.00353***	(0.000977)	-0.0387***	(0.00982)
HeadMar	-0.000514	(0.000621)	0.00566	(0.00686)
NoChildren	0.000374	(0.000233)	-0.00408	(0.00252)
Elders	0.00031	(0.000746)	-0.00338	(0.00811)
Ownland	-0.000187	(0.000468)	0.00206	(0.00514)
Landsize	1.94e-05***	(0.00000658)	-0.00021***	(0.0000685)
Ownlivestock	0.00150**	(0.000629)	-0.0164**	(0.00654)
HHsize	-0.000256	(0.000175)	0.0028	(0.00191)
Remittance	-0.00152	(0.00112)	0.0167	(0.0123)
AssetIndex	-0.000499***	(0.000179)	0.00546***	(0.00183)
LogExpCapita	0.00108***	(0.000341)	-0.0117***	(0.00371)
LogTotalEduexp	-0.00218***	(0.000559)	0.0238***	(0.00557)
Rho	-0.2365	0.03498		
Wald Test, rho=0; chi2(1) Pro		42.316	0.000	
Log Pseudolikehood		-2077923		
Sample		13,963		

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

TableA6a Correlates of School and Hazardous Child Labour Participation for Boys (Model 1)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
RelH	0.00293***	(0.000883)	-0.0394***	(0.00952)
Age	-0.000920***	(0.000351)	0.0163***	(0.00366)
Age2	6.37e-05***	(1.97e-05)	-0.00106***	(0.000164)
FatherEduPrim	-0.00425***	(0.00160)	0.0510***	(0.0137)
FatherEduSec	-0.00281**	(0.00121)	0.0326***	(0.0104)
MotherEduPrim	-0.000945	(0.000608)	0.0329***	(0.0110)
MotherEduSec	0.00112	(0.000733)	-0.0235**	(0.0118)
FatherEmptsta	0.00675***	(0.00153)	-0.0830***	(0.0145)
MotherEmptsta	0.00521***	(0.00110)	-0.0558***	(0.0106)
FatherHH	0.00128	(0.000814)	-0.0149	(0.0114)
MotherHH	-0.000199	(0.000578)	0.00308	(0.00856)
HeadAge	-0.000128*	(0.000067)	0.00168*	(0.000884)
HeadAge2	0.0014**	(0.00064)	-0.0019**	(0.00079)
MaleHead	0.00175***	(0.000648)	-0.0265***	(0.00758)
HeadMar	-0.000894**	(0.000437)	0.0175***	(0.00537)
NoChildren	-0.00003	(0.000142)	0.00100	(0.00208)
Elders	-0.000407	(0.000425)	0.00736	(0.00620)
Ownland	-0.000309	(0.000306)	0.00342	(0.00458)
Landsize	-0.00058	(0.00094)	0.000104	(0.000165)
Ownlivestock	0.000753**	(0.000374)	-0.00894*	(0.00519)
HHsize	0.00009	(0.000111)	-0.00172	(0.00154)
RurUrb	-0.000109	(0.000357)	0.00188	(0.00529)
Remittance	-0.00170**	(0.000818)	0.0246**	(0.0110)
AssetIndex	-0.000404***	(0.000126)	0.00532***	(0.00143)
LogExpCapita	0.000297	(0.000198)	0.000156	(0.00337)
LogTotalEduexp	-0.000408	(0.000311)	0.00288	(0.00468)
Rho	0.28773	0.0407		
Wald Test, rho=0; chi2(1) Pro			44.5752	0.000
Log Pseudolikehood				
Sample			11,359	

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

Table A6b Correlates of School and Hazardous Work Participation for Boys (Model 2)

Independent Variables	Hazardous work Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
RelH	0.00303**	(0.00141)	-0.0374**	(0.0154)
Age	-0.00160**	(0.000672)	0.0219***	(0.00607)
Age2	0.000106***	(3.69e-05)	-0.00142***	(0.000271)
FatherEduPrim	-0.00934**	(0.00382)	0.0901***	(0.0261)
FatherEduSec	-0.00546**	(0.00274)	0.0442**	(0.0180)
MotherEduPrim	-0.00149	(0.00148)	0.0365*	(0.0207)
MotherEduSec	0.000423	(0.00132)	-0.0191	(0.0187)
FatherEmptsta	0.00913***	(0.00215)	-0.109***	(0.0200)
MotherEmptsta	0.00951***	(0.00211)	-0.111***	(0.0223)
FatherHH	0.00210	(0.00153)	-0.0241	(0.0198)
MotherHH	0.000873	(0.00131)	-0.0124	(0.0162)
HeadAge	-0.000133	(0.000109)	0.00171	(0.00133)
HeadAge2	0.00133	(0.0099)	-0.00174	(0.0118)
MaleHead	0.00166	(0.00102)	-0.0214*	(0.0117)
HeadMar	-0.000456	(0.000696)	0.00820	(0.00887)
NoChildren	1.87e-05	(0.000242)	0.000347	(0.00322)
Elders	0.000238	(0.000729)	-0.00230	(0.00936)
Ownland	-0.000523	(0.000528)	0.00666	(0.00653)
Landsize	0.00132	(0.00936)	-0.000151	(0.000124)
Ownlivestock	0.000510	(0.000660)	-0.00584	(0.00836)
HHsize	6.96e-05	(0.000179)	-0.00142	(0.00237)
Remittance	-0.00245*	(0.00128)	0.0303**	(0.0149)
AssetIndex	-0.000245	(0.000188)	0.00316	(0.00236)
LogExpCapita	0.000546	(0.000342)	-0.00525	(0.00497)
LogTotalEduexp	-0.000724	(0.000560)	0.00768	(0.00765)
DistPrimary	0.000395***	(0.000126)	-0.00513***	(0.000946)
DistJHS	9.19e-05*	(5.31e-05)	-0.00129**	(0.000516)
Childwage	0.000141***	(5.02e-05)	-0.00160***	(0.000618)
Rho	-0.22972	0.04775		
Wald Test, rho=0; chi2(1) Pro		21.5312	0.000	
Log Pseudolikehood			-973448	
Sample			6,731	

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

Table A7a Correlates of School and Hazardous Work Participation for Girls (Model 1)

Independent Variables	Child Labour Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
RelH	-0.0238**	(0.0110)	0.00218**	(0.00111)
Age	0.0183***	(0.00493)	-0.000962**	(0.000475)
Age2	-0.00131***	(0.000216)	8.43e-05***	(2.47e-05)
FatherEduPrim	0.0437***	(0.0138)	-0.00339**	(0.00147)
FatherEduSec	0.0129	(0.0106)	-0.000865	(0.00110)
MotherEduPrim	0.0214*	(0.0116)	-0.00123	(0.00104)
MotherEduSec	-0.00116	(0.0112)	-0.000208	(0.000989)
FatherEmptsta	-0.0736***	(0.0148)	0.00860***	(0.00179)
MotherEmptsta	-0.0772***	(0.0118)	0.00964***	(0.00172)
FatherHH	0.00790	(0.0144)	-0.00045	(0.00126)
MotherHH	-0.00872	(0.0113)	0.00164	(0.00105)
HeadAge	-0.000882	(0.00113)	0.00696	(0.0103)
HeadAge2	0.00571	(0.00107)	-0.00044	(0.00096)
MaleHead	-0.0389***	(0.00890)	0.00308***	(0.000966)
HeadMar	0.0114*	(0.00686)	-0.000680	(0.000659)
NoChildren	-0.00542**	(0.00265)	0.000472*	(0.000252)
Elders	0.00449	(0.00839)	-0.000334	(0.000751)
Ownland	0.00597	(0.00564)	-0.000462	(0.000494)
Landsize	-0.00208***	(0.00071)	0.0188**	(0.0076)
Ownlivestock	-0.00460	(0.00598)	0.000640	(0.000531)
HHsize	0.00351*	(0.00208)	-0.000316	(0.000195)
RurUrb	0.00360	(0.00618)	-0.000360	(0.000549)
Remittance	0.000195	(0.0117)	-0.000476	(0.00106)
AssetIndex	0.00446***	(0.00143)	-0.000444***	(0.000151)
LogExpCapita	-0.00757*	(0.00394)	0.00110***	(0.000363)
LogTotalEduexp	0.0166***	(0.00600)	-0.00155***	(0.000565)
Rho	0.3155	0.04158		
Wald Test, rho=0; chi2(1)				
Pro			50.0392	0.000
Log Pseudolikehood				1780829.8
Sample			10,967	

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

Table A7b Correlates of School and Hazardous Work Participation for Girls (Model 2)

Independent Variables	Hazardous work Participation		School Participation	
	Marginal Effect	Std. Error	Marginal Effect	Std. Error
RelH	-0.0187	(0.0202)	0.00169	(0.00188)
Age	0.0134*	(0.00761)	-0.00167**	(0.000791)
Age2	-0.00122***	(0.000338)	0.000136***	(4.16e-05)
FatherEduPrim	0.0611***	(0.0221)	-0.00686**	(0.00304)
FatherEduSec	0.0420**	(0.0172)	-0.00508**	(0.00245)
MotherEduPrim	0.0189	(0.0169)	-0.00169	(0.00165)
MotherEduSec	0.0116	(0.0189)	-0.000890	(0.00180)
FatherEmptsta	-0.105***	(0.0175)	0.00876***	(0.00230)
MotherEmptsta	-0.137***	(0.0173)	0.0115***	(0.00232)
FatherHH	-0.00578	(0.0223)	5.45e-05	(0.00209)
MotherHH	-0.0101	(0.0184)	0.000565	(0.00169)
HeadAge	0.00173	(0.00172)	-0.000153	(0.000163)
HeadAge2	-0.00124	(0.00165)	0.0011	(0.00155)
MaleHead	-0.0478***	(0.0171)	0.00476***	(0.00161)
HeadMar	-0.00122	(0.0111)	-0.000263	(0.00102)
NoChildren	-0.0110***	(0.00398)	0.00102**	(0.000435)
Elders	-0.0117	(0.0144)	0.000995	(0.00142)
Ownland	0.00147	(0.00839)	-0.000289	(0.000780)
Landsize	-0.000142	(0.000127)	1.41e-05	(1.12e-05)
Ownlivestock	-0.0217**	(0.0108)	0.00181*	(0.00107)
HHsize	0.00862***	(0.00299)	-0.000772**	(0.000321)
Remittance	0.00394	(0.0180)	-0.00022	(0.00167)
AssetIndex	0.00739**	(0.00292)	-0.000683**	(0.000310)
LogExpCapita	-0.0185***	(0.00588)	0.00153**	(0.000601)
LogTotalEduexp	0.0330***	(0.00842)	-0.00309***	(0.000974)
DistPrimary	-0.000397	(0.00134)	0.000062	(0.000118)
DistJHS	-0.00201***	(0.000698)	0.000202**	(0.00007)
Childwage	-0.00161**	(0.000665)	0.000130*	(0.00006)
Rho	-0.22765	0.05586		
Wald Test, rho=0; chi2(1) Pro		15.4699	0.000	
Log Pseudolikehood			-907149	
Sample			6,160	

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

Table A8 Correlates of Weekly Hours of Child Labour for Rural Children (5-17 years)

	Overall		Boys		Girls	
Independent Variables	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
Enrol	0.946	(0.905)	2.27	(2.124)	0.126	(1.039)
Boy	0.222	(0.166)	-	-	-	-
ClassAtthrs	0.416	(0.421)	0.101	(0.645)	0.836	(0.521)
RelH	0.699***	(0.164)	0.306	(0.225)	1.124***	(0.237)
Age	-0.022***	(0.0073)	-0.0044	(0.009)	-0.041***	(0.0108)
Age2	-0.0153	(0.0103)	-0.0244*	(0.013)	-0.0057	(0.0156)
FatherEduPrim	-0.715*	(0.405)	-0.835	(0.607)	-0.577	(0.525)
FatherEduSec	-0.25	(0.314)	-0.724	(0.49)	0.25	(0.388)
MotherEduPrim	0.436	(0.32)	-0.65	(0.453)	1.173***	(0.429)
MotherEduSec	-0.21	(0.299)	-0.566	(0.465)	-0.0325	(0.388)
FatherEmptsta	8.127***	(1.035)	8.278***	(1.137)	8.125***	(1.763)
MotherEmptsta	11.56***	(0.933)	13.51***	(1.57)	9.900***	(1.02)
FatherHH	0.954**	(0.457)	0.984	(0.702)	1.030*	(0.59)
MotherHH	2.118***	(0.425)	3.494***	(0.539)	0.811	(0.608)
HeadAge	0.0105	(0.0377)	-0.0468	(0.0551)	0.0772	(0.0476)
HeadAge2	-0.00012	(0.0003)	0.00046	(0.0005)	-0.00077*	(0.0004)
MaleHead	0.772**	(0.309)	0.7	(0.458)	0.636	(0.408)
HeadMar	-0.439**	(0.207)	-0.738**	(0.292)	-0.0463	(0.287)
NoChildren	0.0268	(0.090)	0.0678	(0.115)	-0.0283	(0.14)
Elders	0.482**	(0.227)	0.536	(0.331)	0.429	(0.306)
Ownland	-0.537***	(0.18)	-0.638***	(0.242)	-0.364	(0.259)
Landsize	-0.017***	(0.0041)	-0.016***	(0.0056)	-0.022***	(0.0064)
Ownlivestock	0.0616	(0.208)	-0.0498	(0.296)	0.184	(0.278)
HHsize	0.067	(0.068)	0.0284	(0.0878)	0.118	(0.104)
Remittance	-0.500*	(0.277)	-0.39	(0.406)	-0.636*	(0.342)
AssetIndex	0.0266	(0.085)	0.0168	(0.137)	0.0276	(0.095)
LogExpCapita	-0.513***	(0.118)	-0.577***	(0.168)	-0.414***	(0.16)
LogTotalEduexp	1.391***	(0.17)	1.426***	(0.245)	1.250***	(0.235)
DistPrimary	0.154***	(0.048)	0.252***	(0.0522)	0.0223	(0.0684)
DistJHS	0.0384**	(0.019)	0.0281	(0.0186)	0.058	(0.0362)
Childwage	0.120***	(0.0197)	0.123***	(0.0286)	0.119***	(0.0262)
Pseudo R2		0.1765		0.1789		0.1776
Sample	8,582			4,508		4,074

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

Table A9 Correlates of Weekly Hours of Hazardous Works for Rural Children (5-17 years)

	Overall		Boys		Girls	
Independent Variables	Marg. Effect	Std. Error	Marg. Effect	Std. Error	Marg. Effect	Std. Error
Enrol	1.368	(2.128)	-0.277***	(0.0302)	3.251	(2.99)
Boy	-0.0729	(0.17)	-	-	-	-
ClassAtthrs	0.4	(0.58)	0.145	(0.153)	0.932	(0.794)
RelH	0.215	(0.221)	-0.0769***	(0.0152)	0.588*	(0.327)
Age	-0.000084	(0.0098)	0.0122***	(0.0043)	-0.0176	(0.0149)
Age2	-0.0106	(0.0134)	-0.0180***	(0.0023)	0.000863	(0.02)
FatherEduPrim	-1.591***	(0.616)	-1.615***	(0.391)	-1.535*	(0.836)
FatherEduSec	-0.434	(0.471)	-0.647***	(0.135)	-0.093	(0.621)
MotherEduPrim	1.646***	(0.428)	0.628**	(0.294)	2.237***	(0.609)
MotherEduSec	-0.0833	(0.395)	-0.141**	(0.0704)	-0.242	(0.519)
FatherEmptsta	7.202***	(1.613)	29.80***	(9.387)	6.026***	(1.517)
MotherEmptsta	8.372***	(0.967)	30.25***	(9.527)	6.619***	(0.913)
FatherHH	1.353**	(0.645)	1.418***	(0.546)	1.239	(0.905)
MotherHH	0.282	(0.573)	1.151**	(0.462)	-0.704	(0.866)
HeadAge	-0.0245	(0.0479)	-0.0252***	(0.0057)	-0.0152	(0.0653)
HeadAge2	0.000135	(0.0004)	0.000173**	(0.00008)	0.00003	-0.0006)
MaleHead	0.585	(0.424)	-0.0517	(0.0897)	0.962*	(0.58)
HeadMar	0.789***	(0.3)	0.633**	(0.297)	1.101***	(0.426)
NoChildren	0.102	(0.125)	0.0239	(0.0258)	0.136	(0.192)
Elders	0.914***	(0.342)	0.945**	(0.374)	0.78	(0.475)
Ownland	-0.711***	(0.239)	-0.921***	(0.2)	-0.219	(0.347)
Landsize	-0.0114**	(0.0057)	-0.0087***	(0.0015)	-0.0213*	(0.0118)
Ownlivestock	0.890***	(0.313)	0.378*	(0.22)	1.306***	(0.435)
HHsize	-0.105	(0.095)	-0.0293***	(0.0033)	-0.151	(0.147)
Remittance	-0.621	(0.514)	-0.575***	(0.116)	-0.441	(0.715)
AssetIndex	-0.0797	(0.105)	-0.0362**	(0.0157)	-0.228*	(0.13)
LogExpCapita	-1.276***	(0.175)	-1.219***	(0.399)	-1.123***	(0.233)
LogTotalEduexp	1.296***	(0.239)	0.968***	(0.244)	1.289***	(0.334)
DistPrimary	0.276***	(0.0499)	0.336***	90.115)	0.139**	(0.0681)
DistJHS	-0.0386	(0.0303)	0.0287***	(0.0044)	-0.0363	(0.0505)
Childwage	0.149***	(0.0195)	0.172***	(0.0595)	0.133***	(0.0251)
Log Pseudo likelihood		-1821538		-970877		-841103
Pseudo R2		0.1372		0.1402		0.1332
Sample		8,582		4,508		4,074

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

Table A10 Effect of Hours of Child Labour on Class Attendance for Rural Children

	Overall		Boys		Girls	
Independent Variables	Marg. Effect	Std. Error	Marg. Effect	Std. Error	Marg. Effect	Std. Error
Boy	0.372	(0.286)	-	-	-	-
RelH	-1.459**	(0.644)	-1.638*	(0.853)	-1.163	(0.962)
Age	0.871***	(0.277)	1.345***	(0.387)	0.362	(0.394)
Age2	-0.040***	(0.013)	-0.0627***	(0.0181)	-0.0156	(0.0184)
TypeSch	-1.257***	(0.465)	-1.571**	(0.632)	-0.997	(0.681)
LogHoursCL	-0.135***	(0.0186)	-0.124***	(0.023)	-0.147***	(0.031)
FatherEduPrim	2.064***	(0.744)	2.243**	(1.062)	2.042**	(1.021)
FatherEduSec	0.539	(0.505)	0.862	(0.716)	0.407	(0.709)
MotherEduPrim	-0.483	(0.718)	-0.353	(1.043)	-0.526	(0.978)
MotherEduSec	-0.703	(0.64)	0.0255	(0.916)	-1.476*	(0.881)
FatherEmptsta	-0.025	(0.665)	0.245	(0.88)	-0.221	(1.003)
MotherEmptsta	2.381***	(0.626)	1.946**	(0.826)	2.805***	(0.941)
FatherHH	0.0278	(0.944)	-0.539	(1.334)	0.58	(1.32)
MotherHH	0.45	(0.807)	1.08	(1.117)	-0.434	(1.159)
HeadAge	-0.0769	(0.0636)	-0.112	(0.0894)	-0.0487	(0.0898)
HeadAge2	0.000511	(0.0006)	0.000846	(0.0008)	0.000264	(0.0008)
MaleHead	-0.654	(0.567)	-0.146	(0.787)	-1.106	(0.805)
HeadMar	-1.512***	(0.385)	-1.841***	(0.522)	-1.201**	(0.563)
NoChildren	0.175	(0.148)	0.00275	(0.201)	0.356*	(0.215)
Elders	-0.109	(0.476)	-0.191	(0.659)	-0.0861	(0.679)
Ownland	1.176***	(0.303)	1.406***	(0.416)	0.991**	(0.437)
Landsize	0.00648**	(0.0031)	0.00615	(0.0045)	0.00707	(0.0043)
Ownlivestock	-1.316***	(0.358)	-1.140**	(0.496)	-1.427***	(0.516)
HHsize	0.0339	(0.11)	0.142	(0.149)	-0.0775	(0.161)
Remittance	1.935***	(0.635)	1.205	(0.916)	2.758***	(0.843)
AssetIndex	0.0497	(0.119)	0.206	(0.164)	-0.0899	(0.169)
LogExpCapita	0.378*	(0.198)	-0.0192	(0.276)	0.770***	(0.284)
LogTotalEduexp	-3.565***	(0.323)	-3.052***	(0.455)	-4.118***	(0.457)
DistPrimary	-0.277***	(0.0534)	-0.229***	(0.079)	-0.321***	(0.071)
DistJHS	-0.226***	(0.0262)	-0.235***	(0.036)	-0.213***	(0.038)
Childwage	-0.0207	(0.0233)	-0.0347	(0.034)	-0.00814	(0.0312)
Log Pseudo likelihood		-1165361		-6125916		-5521904
Pseudo R2		0.1031		0.1134		0.113
Sample		12,072		6,319		5,753

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

Table B 1-B15 Appendix for Chapter Three

Table B1 Variables Names and Definitions

VARIABLES	MEANING and DEFINITION
Dependent Variables	
Enrol	A child was in school last year and still in school; 1 if yes; 0 otherwise
ClassAtt	Number of hours that a child enrolled in school attended class in a week
Repetition	A child has ever repeated a class\level; 1 if yes; 0 otherwise
Test Scores	Scores obtained by a child on Raven Coloured Progressive Matrices Test
ChildlabourF	A household used or exchanged children for farming; 1 if yes; 0 otherwise
HoursF	Average daily hours of work done by a child on a farm
ChildlabourNF	A child worked in a non-farm enterprise; 1 if yes; 0 otherwise
HoursNF	Daily hours of work done by a child in a non-farm enterprise
Independent and other Variables	
treatmentyr	This is the variable measuring the effect of the LEAP
pcexphh	Annual expenditure per capita in 2010 GH¢ per household
MaleHead	Household head is a male; 1 if yes; 0 otherwise
HeadAge	Age of the household head
HeadMar	Marital status of the household head; 1 if he/she is married; 0 otherwise
Eduhead	Years of schooling of a household head
Age	Age of a child
Boy	Gender of a child; 1 if boy; 0 otherwise
RelH	Relationship of a child to the head;1 if a son/daughter; 0 otherwise
Childage	Average age of a child in a household
PropBoys	Proportion of boys in a household
Ownanimal	A household owns livestock;1 if yes; 0 otherwise
NoChildren	Number of children in a household (of age<18 years)
HHsize	Household size
Ownland	A household owns farmland; 1 if yes; 0 otherwise
Landsize	Size of farm land in acres
WidowHH	Whether there is a widow in the household; 1 if yes; 0 otherwise
OrphanHH	Whether there is an orphan in the household; 1 if yes; 0 otherwise
Debtowe	Whether household owes debts; 1 if yes; 0 otherwise
NoElder	Number of person 60+ years in the household

Table B2 Educational Outcomes of Children in LEAP and Non-LEAP by Gender and Age

	Baseline (2010)			Follow-Up (2012)		
	NON-LEAP	LEAP	Diff	NON-LEAP	LEAP	Diff
Boys (5-17 Years)						
Enrol	0.945	0.977	-0.032**	0.960	0.990	-0.004
	(0.010)	(0.007)	(0.013)	(0.009)	(0.005)	(0.013)
Class Attendance[2]	25.638	19.910	5.728**	19.061	16.072	2.99
	(0.562)	(0.629)	(0.842)	(1.217)	(1.079)	(0.011)
Repetition[2]	0.123	0.225	-0.102**	0.150	0.169	-0.02
	(0.019)	(0.020)	(0.029)	(0.016)	(0.018)	(1.624)
Test Scores	4.812	4.386	0.426**	5.667	5.144	-0.019**
	(0.113)	(0.119)	(0.168)	(0.128)	(0.140)	(0.024)
Sample	544	430		503	399	
Girls (5-17 Year)						
Enrol	0.934	0.978	-0.044**	0.989	0.994	-0.005
	(0.011)	(0.008)	(0.015)	(0.005)	(0.004)	(0.007)
Class Attendance[2]	23.954	20.393	3.561**	18.146	18.080	0.066
	(0.634)	(0.701)	(0.946)	(1.397)	(1.145)	(1.803)
Repetition[2]	0.151	0.174	-0.024	0.149	0.148	0.001
	(0.023)	(0.020)	(0.030)	(0.017)	(0.018)	(0.025)
Test Scores	4.687	4.431	0.256	5.156	4.728	0.428**
	(0.115)	(0.119)	(0.170)	(0.129)	(0.148)	(0.196)
Sample	499	367		455	360	
Age 5-12 Years						
Enrol	0.969	0.990	-0.021**	0.993	0.999	-0.006
	(0.007)	(0.005)	(0.009)	(0.003)	(0.003)	(0.004)
Class Attendance[2]	24.789	20.154	4.634**	18.747	16.607	2.140
	(0.516)	(0.576)	(0.772)	(1.159)	(0.969)	(1.505)
Repetition[2]	0.103	0.150	-0.048	0.095	0.114	-0.019
	(0.026)	(0.016)	(0.034)	(0.012)	(0.014)	(0.018)
Test Scores	4.425	4.094	0.331**	4.895	4.540	0.355**
	(0.088)	(0.099)	(0.134)	(0.109)	(0.123)	(0.164)
Sample	643	504		598	489	
Age 13-17 Years						
Enrol	0.893	0.956	-0.063**	0.942	0.978	-0.036**
	(0.016)	(0.012)	(0.021)	(0.012)	(0.009)	(0.016)
Class Attendance[2]	24.905	20.096	4.809**	18.388	17.848	0.540
	(0.731)	(0.804)	(1.087)	(1.532)	1.346)	(2.041)
Repetition[2]	0.146	0.290	-0.144**	0.243	0.242	0.001
	(0.017)	(0.027)	(0.030)	(0.023)	(0.026)	(0.034)
Test Scores	5.669	5.128	0.541**	6.433	5.697	0.736**
	(0.171)	(0.150)	(0.233)	(0.150)	(0.169)	(0.225)
Sample	400	293		360	270	

Standard errors in parentheses and ** meaning the difference is significant at 5%; 2 refers to children enrolled in school only

Table B3 Characteristics of Farming Households

	Pre-LEAP (2010)			Post-LEAP (2012)		
	Non-LEAP	**LEAP**	**Diff.**	**Non-LEAP**	**LEAP**	**Diff.**
Male head	0.56	0.53	0.03	0.56	0.51	0.05
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)
Head Age	56	59	-3.00**	58	61	-3.01**
	(0.69)	(0.98)	(1.17)	(0.69)	(1.02)	(1.21)
Head Married	0.50	0.48	0.02	0.53	0.47	0.06
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
Average age of children	9.60	9.00	0.60	9.70	9.30	0.40
	(0.19)	(0.28)	(0.52)	(0.19)	(0.25)	(0.32)
Orphans in Household	0.03	0.27	-0.24**	0.02	0.24	-0.22**
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Widow in Household	0.30	0.46	-0.16**	0.28	0.52	-0.24**
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
Number of Elders (60+)	1.00	2.00	-1.0***	1.00	2.00	-1.0**
	(0.03)	(0.03)	(0.04)	(0.05)	(0.08)	(0.09)
Number of children	3.00	3.00	0.00	3.00	3.00	0.00
	(0.09)	(0.11)	(0.14)	(0.08)	(0.11)	(0.13)
Annual Expenditure/head	561.99	461.84	100.2**	739.97	485.09	254.9**
	(14.62)	(20.47)	(24.80)	(24.22)	(20.74)	(36.84)
Land size (in acres)	3.10	2.90	0.30	2.80	2.50	0.30
	(0.14)	(0.30)	(0.29)	(0.15)	(0.16)	(0.24)
Livestock ownership	0.54	0.57	-0.03	0.67	0.58	0.09**
	(0.02)	(0.030	(0.03)	(0.02)	(0.03)	(0.03)
Remittance	0.37	0.27	0.10**	0.38	0.27	0.11**
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)
Debt owe	0.20	0.28	-0.08*	0.32	0.33	-0.01
	(0.02)	(0.02)	(0.05)	(0.02)	(0.03)	(0.030
Household size	4.00	5.00	-1.00**	5.00	6.00	-1.00**
	(0.10)	(0.14)	(0.17)	(0.11)	(0.15)	(0.02)

Note: Standard errors are parentheses and ** means difference is significant at 5% significant level. These statistics are for sub-sample of farming households and the annual expenditure per capita is in 2010 GH¢

Table B4 Characteristics of LEAP and Non-LEAP Households With Non-Farm Enterprises

	Pre-LEAP (2010)			Post-LEAP (2012)		
	Non-LEAP	LEAP	Diff.	Non-LEAP	LEAP	Diff.
Male head	0.45	0.46	-0.01	0.47	0.46	0.01
	(0.024)	(0.027)	(0.036)	(0.025)	(0.029)	(0.038)
Head Age	52.90	50.4	2.50**	53.8	57.1	-3.3**
	(0.665)	(0.863)	(1.072)	(0.801)	(0.944)	(1.238)
Head Marital Status	0.48	0.51	-0.03	0.52	0.51	0.01
	(0.024)	(0.027)	(0.036)	(0.026)	(0.029)	(0.038)
Orphans in Household	0.033	0.31	-0.27**	0.08	0.12	-0.04
	(0.009)	(0.026)	(0.026)	(0.014)	(0.018)	(0.023)
Widows in Household	0.35	0.42	-0.07**	0.26	0.45	-0.19**
	(0.023)	(0.027)	(0.035)	(0.022)	(0.029)	(0.036)
Number of children	3.76	3.67	0.09	3.33	3.61	-0.28**
	(0.109)	(0.084)	(0.143)	(0.082)	(0.098)	(0.127)
Annual Expenditure/head	450	388	62**	568	430	138**
	(12.60)	(12.91)	(18.20)	(17.16)	(15.02)	(23.49)
Livestock ownership	0.62	0.49	0.13**	0.64	0.46	0.18**
	(0.024)	(0.027)	(0.036)	(0.025)	(0.028)	(0.038)
Remittance	0.33	0.23	0.1**	0.44	0.37	0.07
	(0.023)	(0.023)	(0.033)	(0.025)	(0.028)	(0.038)
Debt owe	0.24	0.36	-0.12**	0.45	0.37	0.08**
	(0.021)	(0.026)	(0.033)	(0.025)	(0.028)	(0.038)
Household size	6.04	6.22	-0.18	6.4	6.8	-0.4**
	(0.128)	(0.112)	(0.174)	(0.118)	(0.134)	(0.178)

Note: These refer to sub-sample of households with non-farm enterprises ** mean the difference is significant at 5%, standard errors are in parentheses

Table B5 Probit Result of Selection into LEAP Programme at Baseline (Matching Results)

Variables	Coeff.	Std. Err.
Log of Per capita expenditure per annum	-0.4565***	0.0612
Male Head	0.0544	0.0791
Age of household head	0.0035	0.0021
Number of Children	-0.0123	0.0183
Drinking water is pipe	-0.2085**	0.0852
Cooking fuel is gas/electricity/kerosene	-0.5443***	0.0909
Household uses of child labour on farm	0.2493***	0.0762
Ownership of Livestock	-0.028***	0.0015
House roofing is iron slate	0.4907***	0.0755
Refuse dumping place	-0.4895***	0.0733
Ownership of house	0.0747	0.0770
Electricity availability	0.1167	0.0719
Presence of a widow in the household	0.0954***	0.0114
Presence of an orphan in the household	0.9384***	0.0154
Number of Elders (60+ years)	0.4802***	0.0539
Number of Household Members with Health Insurance	-0.1706**	0.0770
Receipt of remittance	-0.2291***	0.0744
Land Ownership	-0.5832***	0.0886
Debt owing	-0.0067	0.0753

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

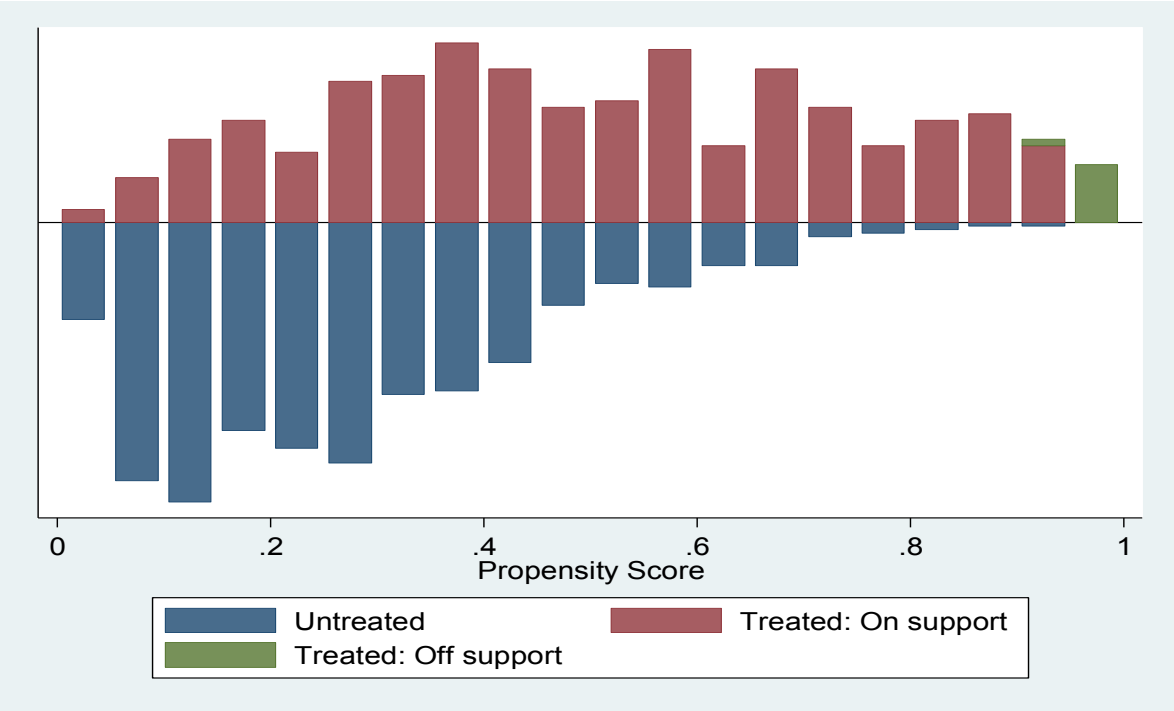
Table B6a Balancing Among LEAP and Non-LEAP at Baseline for Matched and Unmatched

	Unmatched					Matched					
Variable	**Treated**	**Control**	**%bias**	**t-test**	**p>|t|**	**Treated**	**Control**	**%bias**	**t-test**	**p>|t|**	**Bias Red.**
Enrol	0.98	0.94	19	3.93	0.000	1	0.99	3.3	1.12	0.263	82.5
ClassAtt	20.13	24.83	-35.6	-7.45	0.000	22.01	23.83	-11	-1.17	0.201	-42.8
Repetition	0.2	0.14	17.7	3.16	0.002	0.17	0.12	13.3	1.36	0.174	25.2
Test scores	4.41	4.75	-14.7	-2.88	0.004	4.41	4.64	-9.5	-1.24	0.216	35.5
childwork	0.41	0.38	6.8	1.56	0.119	0.4	0.4	0.1	0.02	0.984	97.9
HeadAge	55.48	53.43	12.7	2.95	0.003	52.92	53.98	-6.6	-0.92	0.358	48.1
MaleHead	0.47	0.54	-14.4	-3.29	0.001	0.54	0.6	-12.1	-1.69	0.091	15.9
NoChildren	3.78	3.68	5.1	1.18	0.240	3.7	3.68	1	0.16	0.871	80.5
NoElder	0.67	0.44	33.8	7.82	0.000	0.57	0.6	-4.6	-0.61	0.539	86.3
OrphanHH	0.43	0.03	106.5	25.71	0.000	0.21	0.2	3	0.38	0.705	97.2
WidowHH	0.46	0.27	40.1	9.26	0.000	0.38	0.32	11.9	1.64	0.101	70.3
HHsize	6.18	5.99	7.9	1.82	0.070	6.15	6.22	-3	-0.5	0.62	61.7
pcexphh	348.51	426.3	-33.6	-7.67	0.000	384.55	388.74	-1.8	-0.27	0.786	94.6
Landsize	2.25	2.8	-11.9	-2.8	0.005	2.67	2.4	5.8	0.67	0.5	50.8
Ownanimal	0.52	0.6	-15.7	-3.61	0.000	0.59	0.61	-2.8	-0.39	0.697	82.3
Remittance	0.21	0.32	-25.1	-5.7	0.000	0.25	0.25	-0.9	-0.12	0.904	96.6
Debtowe	0.29	0.25	10.7	2.46	0.014	0.27	0.31	-9.5	-1.3	0.195	10.9

Table B6b Reduction in the Mean and Median Bias After Matching

Sample	Pseudo R2	LR chi2	p>chi2	Mean Bias	Med Bias
Raw	0.249	729.63	0	24.9	14.4
Matched	0.009	17.25	0.188	5.9	4.7

Figure B 1 Propensity Scores of Households in and off Common Support



Multivariate Results (Estimations with controls)

Table B7 Impact of LEAP on Enrolment Rate for Children Aged 5-17 Years

	PSM	DD	MDD
Overall Sample	0.0131**	-0.00572	0.0101
s.e.	(0.00567)	(0.00975)	(0.0106)
N	2095	3,557	2,765
Boy	0.0275**	0.0206	0.0277***
s.e.	(0.0117)	(0.0160)	(0.0100)
N	1,112	1,876	1,445
Girls	0.00647	0.00650	0.00303
s.e.	(0.00484)	(0.0127)	(0.0128)
N	953	1,681	1,289
Younger Children (5-12 years)	0.00743**	-0.0140	-0.0143
s.e.	(0.00378)	(0.0802)	(0.0091)
N	1,379	2,234	1,635
Older Children (13-17 years)	0.0251	0.0715**	0.0775**
s.e.	(0.0215)	(0.0361)	(0.0386)
N	431	1,323	850

Standard errors in parentheses; *** p<0.01, ** p<0.05, *p<0.1, N=sample size

Table B8 Impact of LEAP on Weekly Hours of Class Attendance for Children

	PSM	DD	MDD
Overall Sample	-2.404	2.892**	2.925***
s.e.	(1.477)	(1.366)	(1.102)
N	938	2,526	2,001
Boys	-3.309	5.382**	5.118***
s.e.	(2.134)	(2.531)	(1.861)
N	483	1,321	1,040
Girls	-0.465	6.222	5.238
s.e.	(1.913)	(6.106)	(3.329)
N	440	1,205	949
Younger Children (5-12 years)	-3.910**	5.884**	5.223***
s.e.	(1.908)	(2.489)	(1.760)
N	1,068	1,604	1,220
Older Children (13-17 years)	-2.597	5.891	5.227
s.e.	(2.826)	(3.709)	(3.962)
N	461	922	660

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

Table B9 Impact of LEAP on Repetition Rate for Children Aged 5-17 Years

	PSM	DD	MDD
Overall Sample	0.0311	-0.121***	-0.113***
s.e.	(0.0236)	(0.0264)	(0.0309)
N	1,809	3,130	2,319
Boys	0.0547	-0.138***	-0.128**
s.e.	(0.0359)	(0.0481)	(0.0503)
N	990	1,678	1,231
Girls	-0.0103	-0.0827	-0.102
s.e.	(0.0354)	(0.0635)	(0.0661)
N	787	1,452	1,053
Younger Children (5-12 years)	0.0494*	-0.126	-0.130
s.e.	(0.0255)	(0.1754)	(0.1784)
N	1,331	1,773	1,157
Older Children (13-15 years)	0.0375	-0.185***	-0.174**
s.e.	(0.0502)	(0.0691)	(0.0715)
N	324	1,357	873

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

Table B10 Impact of LEAP on Test Scores (Cognitive Ability) for Children

	PSM	DD	MDD
Overall Sample	-0.328**	-0.0612	-0.109
s.e.	(0.154)	(0.214)	(0.240)
N	1,878	3,168	2,460
Boys	-0.672***	-0.0421	-0.0595
s.e.	(0.235)	(0.307)	(0.335)
N	1,022	1,672	1,282
Girls	-0.179	-0.150	-0.326
s.e.	(0.223)	(0.312)	(0.347)
N	850	1,496	1,151
Younger Children (5-12 years)	-0.300*	0.0554	-0.0487
s.e.	(0.172)	(0.271)	(0.292)
N	901	2,173	1,637
Older Children (13-17 years)	-0.955**	-0.490	-0.502
s.e.	(0.385)	(0.574)	(0.650)
N	218	995	578

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

Table B11 Impact of LEAP on School Expenses for Children by Gender and Age

	PSM	DD	MDD	PSM	DD	MDD
		Girls			**Boys**	
Uniform and Clothing	-0.0681	0.197	0.132	-0.0508	0.0962	0.0561
	(0.0755)	(0.140)	(0.164)	(0.0725)	(0.0959)	(0.113)
Sample	399	1,027	804	636	1,206	934
Books & School Supplies	-0.116	-0.176*	-0.173	-0.21**	-0.0822	-0.0353
	(0.0747)	(0.105)	(0.118)	(0.0809)	(0.0925)	(0.101)
Sample	622	1,261	983	798	1,441	1,126
Food and Boarding	-0.4***	0.0694	-0.0300	-0.4***	-0.0243	-0.0353
	(0.119)	(0.172)	(0.200)	(0.0920)	(0.151)	(0.101)
Sample	460	1,009	804	590	1,152	1,126
Total Expenses	-0.3***	-0.0811	-0.0921	-0.3***	0.141	0.226***
	(0.0837)	(0.129)	(0.143)	(0.0969)	(0.106)	(0.110)
Sample	607	1,653	1,263	1,106	1,883	1,445
	Younger Children (5-12 Year)			**Older Children (13-17 Years)**		
Uniform and Clothing	-0.0869	0.235**	0.218*	-0.153	-0.0683	-0.170
	(0.0562)	(0.101)	(0.123)	(0.154)	(0.173)	(0.256)
Sample	685	1,412	1,067	153	821	516
Books and School Supplies	-0.069	-0.3***	-0.20**	-0.103	0.00301	0.0615
	(0.0684)	(0.0902)	(0.0997)	(0.129)	(0.149)	(0.179)
Sample	981	1,677	1,273	273	1,025	660
Food and Boarding	-0.4***	-0.178	-0.252	-0.49**	-0.353	-0.380
	(0.0885)	(0.148)	(0.187)	(0.202)	(0.270)	(0.339)
Sample	679	1,370	1,049	205	1,370	519
Total Expenses	-0.3***	-0.0496	0.0266	-0.4***	0.188	0.268***
	(0.0699)	(0.110)	(0.127)	(0.146)	(0.162)	(0.073)
Sample	1,010	2,233	1,629	274	1,303	827

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

Table B12 Impact of LEAP Programme on Children Participation in Farming

	PSM	DD	MDD
Overall Sample	0.0263	-0.0930*	-0.0903
s.e.	(0.0347)	(0.0513)	(0.0817)
N	774	1,899	1,695
Extremely Poor	0.0914	-0.0999	-0.0998
s.e.	(0.0612)	(0.0906)	(0.0915)
N	235	608	550
Non-Extremely Poor	0.0327	0.0901	0.0901
s.e.	(0.0421)	(0.117)	(0.117)
N	521	1,284	1,139
Male Headed	0.0743	-0.0454	-0.0362
s.e.	(0.0466)	(0.0682)	(0.0691)
N	451	1,029	941
Female Headed	0.0904*	-0.0867***	-0.0859***
s.e.	(0.0518)	(0.0081)	(0.00823)
N	317	868	753

Table B13 Impact of LEAP Programme on Children's Hours of Work in Farming

	PSM	DD	MDD
Overall	-1.020***	-2.746***	-2.498***
s.e.	(0.297)	(0.445)	(0.44)
N	311	759	683
Extremely Poor	-0.982*	-2.856***	-2.604***
s.e.	(0.584)	(0.727)	(0.735)
N	197	252	228
Non-Extremely Poor	-0.728**	-0.967	-0.967
s.e.	(0.338)	(1.447)	(1.447)
N	205	504	453
Male Headed	-0.168	-2.383***	-1.899***
s.e.	(0.33)	(0.611)	(0.579)
N	187	417	385
Female Headed	-1.687***	-2.662***	-2.354***
s.e.	(0.529)	(0.784)	(0.782)
N	121	341	298

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

Table B14 Impact of LEAP Programme on Children Participation in Non-Farm Works

	PSM	DD	MDD
Overall	-0.0832	-0.0557	-0.00275
s.e.	(0.0761)	(0.0480)	(0.0667)
N	512	1,450	680
Extremely Poor	-0.0146	0.0414***	0.086***
s.e.	(0.0415)	(0.0185)	(0.0182)
N	156	452	279
Non-Extremely Poor	-0.0795	-0.0609	-0.0364
s.e.	(0.0798)	(0.0768)	(0.0977)
N	404	1,098	801
Boys	0.0288	0.00754	0.0935
s.e.	(0.0784)	(0.0565)	(0.0823)
N	205	741	553
Girls	-0.288***	-0.122*	-0.105
s.e.	(0.108)	(0.0663)	(0.0818)
N	192	709	327

Table B15 Impact of LEAP Programme on Hours of Work in Non-Farm Business

	PSM	DD	MDD
Overall	-2.411	-1.975	-1.822
s.e.	(0.908)	(1.593)	(2.503)
N	210	234	122
Extremely Poor	0.339	0.684	4.872***
s.e.	(0.801)	(2.104)	(1.356)
N	101	188	172
Non-Extremely Poor	-6.735***	-2.376	-0.606
s.e.	(0.409)	(1.851)	(2.701)
N	123	386	295
Boys	-7.782***	1.906	3.709
s.e.	(1.722)	(1.42)	(3.017)
N	105	294	252
Girls	-4.064**	-2.542	-0.426
s.e.	(1.712)	(2.348)	(1.464)
N	101	240	170

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

Table C 1-C21 Appendix for Chapter Four

Table C1 Variables Definitions

Enrol	1 If a child was in school the previous year and is still in school; 0 otherwise
ClassAtt	A child's weekly hours of class attendance if he/she is enrolled in school
Childlabour	1 If a household engages in child labour; 0 otherwise
HourW	Average weekly hours of child labour in farming per household
MBP	Mothers' bargaining power constructed from five questions on autonomy
Sex Ratio	Number of men divided by number of women in a district
DiffYrSch	Difference between husband and wife years of schooling
Age	A child's age
Age2	Square of a child's age
Boy	If a child is a boy; and is 1 if yes and 0 otherwise
Average Age	Average age of a child in a household
Average Age2	Squared of average age of a child in a household
PropBoys	Proportion of boys in a household
MaleHead	If a household head is male ; and is 1 if yes and 0 otherwise
CoupleAge	Sum of the ages of husband and wife
Ownland	If a household owns farm land; and is 1 if yes and 0 otherwise
AssetIndexHH	An index of durable assets own by the household
Pcexphh	A household's annual per capita expenditure
Urban	If a household is located in an urban area; and is 1 if yes and 0 otherwise
HHsize	Household size or number of persons in a household
NoChildren	Number of children (persons less than 18 years) in a household

Table C2 Impact of Mothers' Bargaining Power on School Enrolment (IV-Regress)

Variables	All	Rural	Urban	Boys	Girls
MBP	0.310***	0.380***	0.113**	0.257***	0.383***
	(0.0589)	(0.0913)	(0.0514)	(0.0651)	(0.113)
Age	0.104***	0.112***	0.0745***	0.0917***	0.121***
	(0.00922)	(0.0114)	(0.0140)	(0.0117)	(0.0150)
Age2	-0.005***	-0.005***	-0.004***	-0.004***	-0.006***
	(0.000468)	(0.000576)	(0.000717)	(0.000587)	(0.000775)
Boy	0.00952	-0.00427	0.0488**	-	-
	(0.0152)	(0.0190)	(0.0220)	-	-
Ownland	-0.0497**	-0.0547	-0.0274	-0.086***	-0.00403
	(0.0232)	(0.0378)	(0.0268)	(0.0286)	(0.0391)
MaleHead	-0.172**	-0.0716	-0.105	-0.155	-0.169
	(0.0862)	(0.112)	(0.102)	(0.104)	(0.144)
HHsize	-0.0108	-0.0109	0.0135	-0.0241**	0.00525
	(0.00804)	(0.0106)	(0.0135)	(0.0106)	(0.0135)
NoChildren	-0.00616	-0.00588	-0.0167	0.0111	-0.0256*
	(0.00957)	(0.0119)	(0.0167)	(0.0130)	(0.0150)
Pcexphh	0.00155	0.00387	0.00105	0.00198	0.00122
	(0.0023)	(0.00318)	(0.00256)	(0.00258)	(0.00430)
Urban	0.0214	-	-	0.0359	0.00628
	(0.0283)	-	-	(0.0344)	(0.0481)
AssetIndexHH	-0.029***	-0.032***	0.00182	-0.027***	-0.033***
	(0.00725)	(0.00856)	(0.0125)	(0.00922)	(0.0120)
CoupleAge	-0.0009**	-0.0012**	-0.0019**	-0.00102*	-0.00121
	(0.000446)	(0.000583)	(0.000755)	(0.000553)	(0.000786)
Observations	4,746	3,691	1,055	2,490	2,256
Endogeneity Test					
Robust Score Chi2	35.153	26.0532	3.53657	15.5886	18.9531
P-Valve	0.0000	0.0000	0.06	0.0001	0.0000
Robust Regression F	35.3783	26.7293	3.38485	15.68	18.9473
P-Valve	0.0000	0.0000	0.0066	0.0001	0.0000
Over identifying Test					
Score Chi2 (ODT)	0.334127	0.035265	0.266011	0.671896	0.001658
P-valve	0.5632	0.8510	0.6060	0.4124	0.9675
Test of Weak Instruments					
Partial R-Square	0.0251	0.0216	0.0297	0.0192	0.0171
Robust F	36.3206	20.4153	17.7578	25.8999	18.9373
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000

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

Table C3 Impact of Mothers' Bargaining Power on School Attendance (IV-Regress)

Variables	All	Rural	Urban	Boys	Girls
MBP	4.004***	7.569***	0.439	2.292	6.091**
	(1.304)	(1.905)	(1.501)	(1.499)	(2.379)
Age	0.0863	0.0890	-0.127	-0.0155	0.230
	(0.206)	(0.274)	(0.414)	(0.256)	(0.344)
Age2	0.00427	-1.23e-05	0.0215	0.0103	-0.00456
	(0.0103)	(0.0136)	(0.0209)	(0.0126)	(0.0174)
Boy	-0.239	-0.379	-0.200	-	-
	(0.347)	(0.452)	(0.705)	-	-
Ownland	-1.43***	-1.869**	-0.318	-2.23***	-0.236
	(0.536)	(0.803)	(0.807)	(0.689)	(0.908)
MaleHead	-3.112*	-6.76***	3.564	-2.959*	-3.065
	(1.610)	(1.599)	(2.757)	(1.796)	(3.005)
HHsize	-0.182	0.00753	-0.399	-0.427*	0.180
	(0.177)	(0.240)	(0.338)	(0.220)	(0.301)
NoChildren	0.429**	0.422	-0.00930	0.644**	0.0650
	(0.215)	(0.276)	(0.466)	(0.279)	(0.343)
Pcexphh	-0.00276	-0.00407	-0.00710	0.00118	-0.00726
	(0.00561)	(0.00799)	(0.00901)	(0.00661)	(0.0102)
Urban	-2.70***	-	-	-2.94***	-2.339**
	(0.641)	-	-	(0.809)	(1.050)
AssetIndexHH	-0.309*	-0.429**	0.442	-0.378**	-0.312
	(0.159)	(0.196)	(0.394)	(0.191)	(0.286)
CoupleAge	-0.0110	-0.0217*	-0.0112	0.00181	-0.0297*
	(0.00886)	(0.0122)	(0.0206)	(0.0112)	(0.0155)
Observations	3,569	2,613	956	1,915	1,654
Endogeneity Test					
Robust Score Chi2	9.02944	21.2786	0.188342	1.99708	6.99136
P-Valve	0.0027	0.0000	0.0043	0.0076	0.0082
Robust Regression F	9.12376	21.8394	0.186237	1.99209	7.14126
P-Valve	0.0025	0.0000	0.0062	0.0083	0.0076
Over identifying Test					
Score Chi2 (ODT)	7.37745	1.6562	0.424943	10.282	0.444858
P-valve	0.6600	0.1981	0.5145	0.513	0.5048
Test of Weak Instruments					
Partial R-Square	0.014	0.0113	0.0174	0.0277	0.0205
Robust F	26.8607	19.324	22.627	19.141	17.1494
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0001

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

Table C4 Impact of Mothers' Bargaining Power on Child Labour (IV-Regress)

Variables	Participation	Hours
MBP	-0.176***	-8.287
	(0.0130)	(7.024)
Age	0.00992	0.102
	(0.00699)	(0.128)
Age2	-0.0100*	-0.00184*
	(0.00598)	(0.00111)
Boy	-0.0582	1.000
	(0.135)	(4.037)
Ownland	0.392***	7.243***
	(0.0285)	(0.602)
HHsize	0.0193	0.210
	(0.0141)	(0.294)
NoChildren	0.00994	0.386
	(0.0178)	(0.378)
Pcexphh	-0.00472	-0.0142**
	(0.00357)	(0.00714)
Urban	-0.0126	-0.892
	(0.0578)	(1.194)
AssetIndexHH	0.0136	0.182
	(0.0121)	(0.262)
CoupleAge	0.00228	0.0710*
	(0.00197)	(0.0367)
Observations	1,462	1,462
Endogeneity Test		
Robust Score Chi2	1.57559	0.162122
P-Valve	0.0209	0.6872
Robust Regression F	1.53627	0.16074
P-Valve	0.0215	0.6885
Over identifying Test		
Score Chi2 (ODT)	0.025679	8.54008
P-valve	0.8727	0.0035
Test of Weak Instruments		
Partial R-Square	0.0094	0.0078
Robust F	16.5617	4.5091
Prob>F	0.0005	0.0112

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

Using the Un-weighted Index of Mothers' Autonomy

Table C5 Impact of Mothers' Bargaining Power on School Enrolment (Marginal Effect)

	All		Rural		Urban	
Variables	Probit	IV-Probit	Probit	IV-Probit	Probit	IV-Probit
MBP	0.0262***	0.254***	0.0248***	0.290***	0.0179**	0.115**
	(0.00615)	(0.0309)	(0.00767)	(0.0358)	(0.00738)	(0.0565)
Age	0.111***	0.0831***	0.122***	0.0827***	0.0668***	0.0676***
	(0.00781)	(0.0110)	(0.00946)	(0.0145)	(0.0107)	(0.0120)
Age2	-0.050***	-0.038***	-0.054***	-0.0379***	-0.0319***	-0.032***
	(0.0040)	(0.0053)	(0.00482)	(0.00673)	(0.0055)	(0.0062)
Boy	0.0304**	0.0118	0.0177	-0.00203	0.0592***	0.0572***
	(0.0131)	(0.0133)	(0.0158)	(0.0152)	(0.0190)	(0.0215)
Ownland	-0.067***	-0.0441*	-0.119***	-0.0400	-0.0117	-0.0257
	(0.0217)	(0.0226)	(0.0325)	(0.0357)	(0.0216)	(0.0262)
MaleHead	0.0294	-0.134*	0.0555	-0.0484	0.00744	-0.117
	(0.0632)	(0.0741)	(0.0824)	(0.0940)	(0.0663)	(0.105)
HHsize	-0.0169**	-0.00708	-0.027***	-0.00695	0.0134	0.0116
	(0.00682)	(0.00693)	(0.00824)	(0.00844)	(0.0117)	(0.0141)
NoChildren	-0.00736	-0.00348	0.000713	-0.00379	-0.0214	-0.0128
	(0.00823)	(0.00810)	(0.00988)	(0.00893)	(0.0137)	(0.0171)
Pcexphh	0.0795***	0.0291	0.0120***	0.0496	0.0224	0.0891
	(0.0252)	(0.0254)	(0.0031)	(0.0314)	(0.0276)	(0.308)
Urban	0.127***	0.0227	-	-	-	-
	(0.0216)	(0.0297)	-	-	-	-
AssetIndexHH	-0.025***	-0.026***	-0.033***	-0.025***	0.0111	-0.0021
	(0.0064)	(0.0063)	(0.0076)	(0.0076)	(0.0107)	(0.0137)
CoupleAge	-0.0286	-0.0882**	0.00603	-0.0881**	-0.0149**	-0.0160**
	(0.0356)	(0.0354)	(0.0418)	(0.0415)	(0.00583)	(0.00650)
Observations	4,746	4,746	3,691	3,691	1,055	1,055
Log pseudo likelihood	-2504.18	-9474.83	2124.29	-7357.97	-363.03	-2049.51
Pseudo R2	0.1072		0.0842		0.0782	
Exogeneity Test						
Wald Test: Chi2		31.52		24.15		3.92
Prob>Chi2		0.0000		0.0000		0.0478
Over identifying Test						
Score Chi2 (ODT)		0.334127		0.007807		0.41708
P-valve		0.5632		0.9296		0.5184
Test of Weak Instruments						
Partial R-Square		0.0151		0.0121		0.0284
Robust F		36.3206		20.7929		16.9606
Prob>F		0.0000		0.0000		0.0000

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

Table C6 Impact of Mothers' Bargaining Power on School Enrolment by Gender

	Boys		Girls	
Variables	Probit	IV-Probit	Probit	IV-Probit
MBP	0.0345***	0.232***	0.0169***	0.275***
	(0.00811)	(0.0439)	(0.00529)	(0.0429)
Age	0.101***	0.0801***	0.123***	0.0861***
	(0.0103)	(0.0134)	(0.0119)	(0.0181)
Age2	-0.0438***	-0.0350***	-0.057***	-0.0413***
	(0.00524)	(0.00636)	(0.00610)	(0.00874)
Ownland	-0.0963***	-0.0841***	-0.0400	-0.00628
	(0.0291)	(0.0309)	(0.0325)	(0.0329)
MaleHead	0.0524	-0.110	0.00388	-0.139
	(0.0842)	(0.0962)	(0.0956)	(0.115)
HHsize	-0.0248***	-0.0191**	-0.00915	0.00533
	(0.00948)	(0.00952)	(0.0101)	(0.0103)
NoChildren	0.00567	0.0112	-0.0201*	-0.0179
	(0.0114)	(0.0114)	(0.0121)	(0.0118)
Pcexphh	0.0758***	0.0324	0.0852*	0.0285
	(0.0278)	(0.0308)	(0.0439)	(0.0404)
Urban	0.144***	0.0521	0.111***	-0.00436
	(0.0288)	(0.0409)	(0.0326)	(0.0429)
AssetIndexHH	-0.0239***	-0.0240***	-0.025***	-0.0268***
	(0.0086)	(0.0085)	(0.0096)	(0.0092)
CoupleAge	-0.00642	-0.00876*	0.00698	-0.0105*
	(0.00475)	(0.00471)	(0.0539)	(0.00548)
Observations	2,490	2,490	2,256	2,256
Log pseudo likelihood	-1265.5767	-4936.4466	-1229.591	-4525.8136
Pseudo R2	0.1173		0.1012	
Exogeneity Test				
Wald Test: Chi2		14.46		16.47
Prob>Chi2		0.0001		0.0000
Over identifying Test				
Score Chi2 (ODT)		1.33949		0.002307
P-valve		0.2471		0.9617
Test of Weak Instruments				
Partial R-Square		0.0191		0.0121
Robust F		24.5539		13.2364
Prob>F		0.0000		0.0000

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

Table C7 Impact of Mothers' Bargaining Power on Class Attendance

	All		Rural		Urban	
Variables	Tobit	IV-Tobit	Tobit	IV-Tobit	Tobit	IV-Tobit
MBP	0.403***	3.624***	0.683***	6.643***	-0.217	0.464
	(0.129)	(1.403)	(0.143)	(1.748)	(0.251)	(1.338)
Age	0.146	0.0962	0.268	0.116	-0.107	-0.114
	(0.184)	(0.197)	(0.204)	(0.251)	(0.390)	(0.392)
Age2	0.0157	0.0287	-0.0655	-0.0281	0.0193	0.0199
	(0.0922)	(0.0981)	(0.101)	(0.124)	(0.0197)	(0.0198)
Boy	0.0479	-0.179	0.133	-0.333	-0.132	-0.169
	(0.302)	(0.332)	(0.332)	(0.416)	(0.651)	(0.656)
Ownland	-1.253**	-1.320***	-1.98***	-1.415**	-0.209	-0.311
	(0.492)	(0.506)	(0.668)	(0.721)	(0.713)	(0.770)
MaleHead	-0.215	-3.008*	-3.12***	-6.37***	4.121**	3.252
	(1.227)	(1.698)	(1.201)	(1.588)	(2.041)	(2.602)
HHsize	-0.243	-0.154	-0.241	0.0525	-0.354	-0.373
	(0.157)	(0.166)	(0.178)	(0.211)	(0.312)	(0.317)
NoChildren	0.338*	0.398**	0.419**	0.366	-0.0732	-0.0115
	(0.188)	(0.199)	(0.211)	(0.235)	(0.408)	(0.435)
Pcexphh	0.0245	-0.0270	0.0713	-0.0344	-0.0591	-0.0687
	(0.0453)	(0.0550)	(0.0572)	(0.0732)	(0.0817)	(0.0853)
Urban	-1.700***	-2.777***	-	-	-	-
	(0.479)	(0.696)	-	-	-	-
AssetIndexHH	-0.178	-0.302*	-0.308**	-0.362**	0.501	0.393
	(0.141)	(0.155)	(0.156)	(0.180)	(0.326)	(0.394)
CoupleAge	-0.0394	-0.123	-0.0168	-0.212*	-0.108	-0.112
	(0.0804)	(0.0877)	(0.0880)	(0.115)	(0.196)	(0.194)
Observations	3,569	3,569	2,613	2,613	956	956
Log pseudo likelihood	-12924.418	-18284.28	-9254.15	-13039.1	-3613.08	-5145.34
Pseudo R2	0.078		0.031		0.027	
Exogeneity Test						
Wald Test: Chi2		5.12		10.57		0.26
Prob>Chi2		0.0236		0.0011		0.6105
Over identifying Test						
Score Chi2 (ODT)		10.0583		3.85463		0.394723
P-valve		0.0015		0.0496		0.5298
Test of Weak Instruments						
Partial R-Square		0.0144		0.0113		0.0348
Robust F		26.493		14.5433		19.948
Prob>F		0.0000		0.0000		0.0000

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

Table C8 Impact of Mothers' Bargaining Power on Class Attendance by Gender

	Boys		Girls	
Variables	Tobit	IV-Tobit	Tobit	IV-Tobit
MBP	1.394	1.844	0.425**	5.091***
	(1.712)	(1.945)	(0.193)	(1.975)
Age	0.0226	0.0193	0.301	0.149
	(0.242)	(0.246)	(0.285)	(0.322)
Age2	0.00836	0.00812	-0.00696	-0.00153
	(0.0119)	(0.0121)	(0.0145)	(0.0161)
Ownland	-1.968***	-2.108***	-0.451	-0.206
	(0.641)	(0.672)	(0.761)	(0.826)
MaleHead	-1.437	-2.612	1.589	-2.892
	(1.417)	(2.063)	(2.152)	(2.817)
HHsize	-0.403*	-0.394*	-0.0753	0.155
	(0.208)	(0.207)	(0.235)	(0.268)
NoChildren	0.520**	0.591**	0.147	0.0853
	(0.249)	(0.271)	(0.280)	(0.306)
Pcexphh	0.0229	0.0028	0.0326	-0.0572
	(0.0587)	(0.0670)	(0.0714)	(0.0922)
Urban	-2.317***	-2.838***	-1.048	-2.518**
	(0.621)	(0.946)	(0.743)	(1.043)
AssetIndexHH	-0.341*	-0.374**	0.0115	-0.269
	(0.180)	(0.187)	(0.222)	(0.261)
CoupleAge	0.00341	0.00131	-0.0117	-0.0296**
	(0.0108)	(0.0110)	(0.0120)	(0.0145)
Observations	1,915	1,915	1,654	1,654
Log pseudo likelihood	-6912.5275	-9801.1318	-6007.212	-8473.537
Pseudo R2	0.028		0.019	
Exogeneity Test				
Wald Test: Chi2		0.56		5.18
Prob>Chi2		0.4541		0.0228
Over identifying Test				
Score Chi2 (ODT)		12.2505		0.782911
P-valve		0.005		0.3763
Test of Weak Instruments				
Partial R-Square		0.0182		0.0113
Robust F		18.5026		19.52309
Prob>F		0.0000		0.0000

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

Table C9 Impact of Mothers' Bargaining Power on Child Labour (Mag. Effects)

	Participation		Hours	
Variables	Probit	IV-Probit	Tobit	IV-Tobit
MBP	-0.0276**	-0.172***	-1.310*	-1.643
	(0.0126)	(0.0196)	(1.187)	(3.734)
Age	0.00898	0.0104	0.154	0.159
	(0.00692)	(0.00705)	(0.102)	(0.118)
Age2	-0.0893	-0.0111*	-0.0194**	-0.0201*
	(0.0572)	(0.0059)	(0.0081)	(0.0110)
Boy	-0.132	-0.0782	-0.146	-0.0455
	(0.168)	(0.180)	(3.521)	(3.786)
Ownland	0.870***	0.802***	14.79***	14.80***
	(0.112)	(0.152)	(2.273)	(2.269)
HHsize	0.0245	0.0223	0.260	0.260
	(0.0151)	(0.0147)	(0.210)	(0.210)
NoChildren	0.00808	0.00224	0.129	0.117
	(0.0185)	(0.0183)	(0.262)	(0.293)
Pcexphh	-0.0110***	-0.0831*	-0.0171**	-0.0167**
	(0.0042)	(0.0489)	(0.00671)	(0.00838)
Urban	-0.105**	-0.0257	-1.131	-0.970
	(0.0457)	(0.0803)	(0.776)	(1.923)
AssetIndexHH	0.0124	0.0136	0.172	0.177
	(0.0125)	(0.0120)	(0.194)	(0.206)
CoupleAge	0.00192	0.00267	0.0497*	0.0518
	(0.00190)	(0.00192)	(0.0298)	(0.0381)
Observations	1,462	1,462	1,462	1,462
Log pseudo likelihood	-814.58508	-2938.0236	-3064.406	
Pseudo R2	0.1785		0.0544	
Exogeneity Test				
Wald Test: Chi2		1.45		8.44794
Prob>Chi2		0.2291		0.0037
Over identifying Test				
Score Chi2 (ODT)		0.012238		
P-valve		0.9119		
Test of Weak Instruments				
Partial R-Square		0.01		
Robust F		7.33278		
Prob>F		0.0007		

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

Table C10 Summary of Mothers' Autonomy Based on 5 Indicators

	Mean	Std. Dev.	Min	Max
Un-weighted Index				
Men Responses	3.208	1.089	0	5
Women Responses	3.393	1.027	0	5

Instrumental Variable Estimation for Each Instrument
Using Difference in Years of Schooling Completed as Instrument

Table C11 Impact of Mothers' Bargaining Power on School Enrolment

Variables	All	Rural	Urban	Boys	Girls
MBP	0.280***	0.327***	0.135**	0.254***	0.309***
	(0.0342)	(0.0405)	(0.0667)	(0.0477)	(0.0471)
Age	0.083***	0.081***	0.068***	0.079***	0.087***
	(0.011)	(0.015)	(0.012)	(0.014)	(0.018)
Age2	-0.0038***	-0.0037***	-0.0032***	-0.0034***	-0.0042***
	(0.00053)	(0.00072)	(0.00064)	(0.00065)	(0.00089)
Boy	0.00834	-0.00532	0.0526**	-	-
	(0.0135)	(0.0153)	(0.0225)	-	-
Ownland	-0.0484**	-0.0472	-0.0270	-0.092***	-0.0055
	(0.0227)	(0.0361)	(0.0270)	(0.0312)	(0.0329)
MaleHead	-0.146**	-0.0609	-0.135	-0.130	-0.138
	(0.0740)	(0.0909)	(0.113)	(0.0962)	(0.115)
HHsize	-0.00680	-0.00586	0.0115	-0.0197**	0.00689
	(0.00710)	(0.00897)	(0.0141)	(0.00965)	(0.0106)
NoChildren	-0.00418	-0.00505	-0.0114	0.0113	-0.0193
	(0.00828)	(0.00935)	(0.0177)	(0.0116)	(0.0120)
Pcexphh	0.0256	0.0402	0.0092	0.0316	0.0193
	(0.0257)	(0.0320)	(0.0321)	(0.0305)	(0.0413)
Urban	0.0304	-	-	0.0553	0.00812
	(0.0295)	-	-	(0.0407)	(0.0425)
AssetIndexHH	-0.025***	-0.024***	-0.0058	-0.024**	-0.025***
	(0.0063)	(0.0076)	(0.014)	(0.0091)	(0.0092)
CoupleAge	-0.0881**	-0.010**	-0.014**	-0.0918*	-0.0103*
	(0.0354)	(0.0042)	(0.0067)	(0.047)	(0.0054)
Observations	4,746	3,691	1,055	2,490	2,256
Exogeneity Test					
Wald Test: Chi2	31.02	21.68	4.38	14.64	16.03
Prob>Chi2	0.0000	0.0000	0.0364	0.0001	0.0001
Test of Weak Instruments					
Partial R-Square	0.0149	0.0103	0.0258	0.019	0.0107
Robust F	70.131	33.975	31.055	50.771	22.387
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000

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

Table C12 Impact of Mothers' Bargaining Power on School Attendance

Variables	All	Rural	Urban	Boys	Girls
MBP	3.046**	5.364***	1.00674	1.743	4.994**
	(1.257)	(2.054)	(1.563)	(1.457)	(2.310)
Age	0.101	0.134	-0.109	-0.00949	0.237
	(0.193)	(0.238)	(0.390)	(0.247)	(0.311)
Age2	0.0335	-0.0181	0.0195	0.0988	-0.0535
	(0.0962)	(0.117)	(0.019)	(0.122)	(0.158)
Boy	-0.160	-0.219	-0.144	-	-
	(0.327)	(0.403)	(0.667)	-	-
Ownland	-1.35***	-1.819**	-0.243	-2.13***	-0.245
	(0.505)	(0.715)	(0.751)	(0.668)	(0.826)
MaleHead	-2.346	-5.46***	3.838	-2.500	-2.302
	(1.537)	(1.491)	(2.740)	(1.756)	(2.846)
HHsize	-0.189	-0.0590	-0.360	-0.413*	0.140
	(0.166)	(0.214)	(0.318)	(0.212)	(0.274)
NoChildren	0.393**	0.400*	-0.0529	0.598**	0.0672
	(0.200)	(0.238)	(0.445)	(0.268)	(0.310)
Pcexphh	-0.0159	-0.0106	-0.0623	0.0065	-0.0576
	(0.0526)	(0.0739)	(0.085)	(0.0638)	(0.0936)
Urban	-2.37***	-	-	-2.71***	-2.003**
	(0.602)	-	-	(0.779)	(0.966)
AssetIndexHH	-0.267*	-0.375**	0.466	-0.363**	-0.245
	(0.151)	(0.170)	(0.377)	(0.185)	(0.266)
CoupleAge	-0.0906	-0.0153	-0.0109	0.00225	-0.0257*
	(0.0839)	(0.0110)	(0.019)	(0.0109)	(0.0141)
Observations	3,569	2,613	956	1,915	1,654
Exogeneity Test					
Wald Test: Chi2	4.71	5.25	0.02	1.07	3.73
Prob>Chi2	0.03	0.022	0.085	0.031	0.034
Test of Weak Instruments					
Partial R-Square	0.0131	0.0072	0.0315	0.0175	0.0086
Robust F	48.846	17.153	37.887	37.086	18.9555
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0002

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

Table C13 Impact of Mothers' Bargaining Power on Child Labour

Variables	Participation	Hours
MBP	-0.191***	-1.168
	(0.022)	(2.382)
Age	0.0115	0.173
	(0.0709)	(0.115)
Age2	-0.0118**	-0.0214**
	(0.00594)	(0.00975)
Boy	-0.08	0.0566
	(0.175)	(3.664)
Ownland	0.804***	14.86***
	(0.156)	(2.279)
HHsize	0.021	0.252
	(0.0147)	(0.211)
NoChildren	0.00307	0.108
	(0.018)	(0.271)
Pcexphh	-0.0791	-0.0159**
	(0.0503)	(0.00752)
Urban	-0.0371	-0.847
	(0.0752)	(1.150)
AssetIndexHH	0.0131	0.181
	(0.012)	(0.198)
CoupleAge	0.00249	0.0532
	(0.00188)	(0.0324)
Observations	1,462	1,462
Exogeneity Test		
Wald Test: Chi2	1.44	0.13
Prob>Chi2	0.023	0.715
Test of Weak Instruments		
Partial R-Square	0.0093	0.0093
Robust F	23.062	13.062
Prob>F	0.0000	0.0002

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

Using District Sex Ratio as Instrument

Table C14 Impact of Mothers' Bargaining Power on School Enrolment

Variables	All	Rural	Urban	Boys	Girls
MBP	0.336***	0.287**	0.0598	0.374***	0.300***
	(0.115)	(0.116)	(0.125)	(0.129)	(0.102)
Age	0.0657	0.0919***	0.0671***	0.0406	0.0895
	(0.0439)	(0.0296)	(0.0113)	(0.0702)	(0.0551)
Age2	-0.0030	-0.042***	-0.031***	-0.0169	-0.0429*
	(0.002)	(0.0013)	(0.00576)	(0.0309)	(0.0253)
Boy	-6.32e-05	-0.00126	0.0562***	-	-
	(0.0226)	(0.0183)	(0.0214)	-	-
Ownland	-0.0395	-0.0623	-0.0174	-0.0676	-0.00802
	(0.0347)	(0.0523)	(0.0291)	(0.0637)	(0.0453)
MaleHead	-0.190*	-0.0422	-0.0438	-0.251	-0.133
	(0.115)	(0.102)	(0.170)	(0.175)	(0.142)
HHsize	-0.00354	-0.0101	0.0125	-0.0113	0.00554
	(0.0111)	(0.0132)	(0.0128)	(0.0187)	(0.0156)
NoChildren	-0.00198	-0.00419	-0.0178	0.0141	-0.0188
	(0.00898)	(0.00966)	(0.0187)	(0.0110)	(0.0135)
Pcexphh	0.0068	0.0055	0.0018	-0.0091	0.0022
	(0.0052)	(0.0051)	(0.0031)	(0.0074)	(0.0074)
Urban	-0.00502	-	-	-0.0349	0.0136
	(0.0831)	-	-	(0.142)	(0.0978)
AssetIndexHH	-0.219**	-0.269***	0.0732	-0.0168	-0.025**
	(0.0902)	(0.0941)	(0.167)	(0.0151)	(0.0109)
CoupleAge	-0.100**	-0.0856	-0.0143**	-0.094**	-0.0988
	(0.0402)	(0.0578)	(0.0061)	(0.0468)	(0.0885)
Observations	4,746	3,691	1,055	2,490	2,256
Exogeneity Test					
Wald Test: Chi2	2.23	2.67	0.15	1.03	1.07
Prob>Chi2	0.0135	0.0102	0.016	0.007	0.0030
Test of Weak Instruments					
Partial R-Square	0.043	0.17	0.042	0.025	0.067
Robust F	21.5867	16.9181	15.2045	14.3495	15.62798
Prob>F	0.0001	0.0086	0.0022	0.0042	0.0021

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

Table C15 Impact of Mothers' Bargaining Power on School Attendance

Variables	All	Rural	Urban	Boys	Girls
MBP	11.65**	9.028***	2.407	19.32	7.871***
	(5.916)	(2.818)	(3.497)	(23.82)	(2.024)
Age	-0.0755	0.0114	-0.121	-0.351	0.176
	(0.301)	(0.285)	(0.402)	(0.716)	(0.359)
Age2	0.00860	0.00219	0.0207	0.0216	-0.00376
	(0.0148)	(0.0140)	(0.0204)	(0.0350)	(0.0178)
Boy	-0.842	-0.508	-0.354	-	-
	(0.650)	(0.479)	(0.724)	-	-
Ownland	-1.409**	-1.525*	-0.546	-3.432	-0.0904
	(0.717)	(0.790)	(0.926)	(3.176)	(0.914)
MaleHead	-9.378*	-7.139***	0.883	-16.04	-4.878
	(5.113)	(1.966)	(4.640)	(19.28)	(4.811)
HHsize	0.0412	0.107	-0.425	-0.341	0.281
	(0.262)	(0.256)	(0.336)	(0.496)	(0.372)
NoChildren	0.505*	0.354	0.175	1.401	0.0106
	(0.307)	(0.274)	(0.534)	(1.505)	(0.351)
Pcexphh	-0.0154	-0.0804	-0.0906	-0.0224	-0.0116
	(0.0119)	(0.0864)	(0.0949)	(0.0337)	(0.0137)
Urban	-4.362**	-	-	-7.390	-2.585*
	(1.703)	-	-	(7.669)	(1.378)
AssetIndexHH	-0.531*	-0.405**	0.172	-0.559	-0.409
	(0.291)	(0.200)	(0.552)	(0.630)	(0.379)
CoupleAge	-0.0259	-0.0262*	-0.0081	-0.0166	-0.0342
	(0.0171)	(0.0141)	(0.0199)	(0.0347)	(0.0213)
Observations	3,569	2,613	956	1,915	1,654
Exogeneity Test					
Wald Test: Chi2	4.38	7.97	3.57	3.74	4.97
Prob>Chi2	0.0259	0.0048	0.0316	0.0395	0.0216
Test of Weak Instruments					
Partial R-Square	0.11	0.047	0.066	0.031	0.012
Robust F	14.5439	13.759	17.2466	18.7368	14.5851
Prob>F	0.0031	0.0002	0.0021	0.0013	0.0032

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

Table C16 Impact of Mothers' Bargaining Power on Child Labour

Variables	Participation	Hours
MBP	-0.265***	105.4
	(0.127)	(609.8)
Age	0.0120	-1.776
	(0.00912)	(11.23)
Age2	-0.00125	0.0200
	(0.00126)	(0.127)
Boy	-0.0488	-26.98
	(0.874)	(156.2)
Ownland	0.714	18.59
	(2.591)	(20.46)
HHsize	0.0185	1.002
	(0.0856)	(5.161)
NoChildren	-0.000575	3.356
	(0.0802)	(18.87)
Pcexphh	-0.00584	-0.0158
	(0.0565)	(0.0816)
Urban	-0.00198	-39.27
	(0.971)	(220.3)
AssetIndexHH	0.0128	-0.972
	(0.0198)	(6.908)
CoupleAge	0.00268	-0.436
	(0.00342)	(2.822)
Observations	1,462	1,462
Exogeneity Test		
Wald Test: Chi2	0.01	0.04
Prob>Chi2	0.9166	0.8389
Test of Weak Instruments		
Partial R-Square	0.019	0.011
Robust F	12.0365	9.0365
Prob>F	0.0014	0.0048

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

Using Women's Responses to Construct the Autonomy Index

Table C17 Impact of Mothers' Bargaining Power on School Enrolment

Variables	All		Rural		Urban	
	Probit	IV-Probit	Probit	IV-Probit	Probit	IV-Probit
MBP	0.0319***	0.421***	0.0436***	0.403***	0.0588**	-0.0828**
	(0.0065)	(0.0219)	(0.00812)	(0.0483)	(0.00091)	(0.0104)
Age	0.110***	0.0163	0.121***	0.0434	0.0682***	0.0683***
	(0.00776)	(0.0397)	(0.00946)	(0.0373)	(0.0107)	(0.0109)
Age2	-0.005***	-0.0007	-0.005***	-0.0019	-0.003***	-0.003***
	(0.0003)	(0.0018)	(0.00048)	(0.00167)	(0.0005)	(0.0005)
Boy	0.0269**	-0.00421	0.0126	0.00446	0.061***	0.061***
	(0.0130)	(0.0154)	(0.0157)	(0.0143)	(0.0190)	(0.0221)
Ownland	-0.073***	0.0538	-0.132***	-0.0197	-0.0134	-0.0128
	(0.0211)	(0.0370)	(0.0320)	(0.0535)	(0.0214)	(0.0343)
MaleHead	0.0544	0.0404	0.0222	0.134**	0.0861	0.0851
	(0.0561)	(0.0410)	(0.0756)	(0.0540)	(0.0528)	(0.0638)
HHsize	-0.019***	-0.018**	-0.032***	-0.039***	0.0139	0.0140
	(0.00672)	(0.00796)	(0.00828)	(0.00830)	(0.0114)	(0.0116)
NoChildren	-0.00482	0.0169**	0.00669	0.0350***	-0.0217	-0.0219
	(0.0081)	(0.00737)	(0.00993)	(0.00828)	(0.0134)	(0.0165)
Pcexphh	0.081***	-0.002	0.001***	0.0284	0.004	0.032
	(0.004)	(0.032)	(0.00036)	(0.0147)	(0.0025)	(0.0281)
Urban	0.122***	-0.0301	-	-	-	-
	(0.0209)	(0.0500)	-	-	-	-
AssetIndexHH	-0.023***	-0.0103	-0.029***	-0.0151	0.0113	0.0111
	(0.00633)	(0.00946)	(0.00752)	(0.0106)	(0.0102)	(0.0118)
CoupleAge	-0.000301	-0.01***	6.87e-05	-0.0009**	-0.0015**	-0.0015**
	(0.0003)	(0.0003)	(0.000418)	(0.000395)	(0.000595)	(0.000741)
Observations	4,746	4,746	3,691	3,691	1,055	1,055
Exogeneity Test						
Wald Test:						
Chi2		16.03		13.5		11.8
Prob>Chi2		0.0000		0.0000		0.0038
Overidentifying Test						
Score Chi2 (ODT)		0.2314		0.0671		0.3111
P-valve		0.6501		0.9980		0.5780
Test of Weak Instruments						
Partial R-Square		0.0251		0.0216		0.0297
Robust F		24.123		18.511		14.987
Prob>F		0.0000		0.0000		0.0000

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

Table C18 Impact of Mothers' Bargaining Power on School Enrolment by Gender

Variables	Boys		Girls	
	Probit	IV-Probit	Probit	IV-Probit
MBP	0.0372***	0.1501***	0.0260***	0.415***
	(0.0088)	(0.0214)	(0.0097)	(0.0228)
Age	0.101***	0.0938	0.122***	0.0163
	(0.0103)	(0.0734)	(0.0117)	(0.0349)
Age2	-0.0044***	-0.00408	-0.0057***	-0.000739
	(0.0005)	(0.0033)	(0.0006)	(0.0016)
Ownland	-0.103***	-0.112***	-0.0449	0.0917***
	(0.0286)	(0.0277)	(0.0312)	(0.0347)
MaleHead	0.0564	0.0592	0.0522	0.0874
	(0.0799)	(0.0902)	(0.0802)	(0.0560)
HHsize	-0.0270***	-0.0144	-0.0125	-0.00930
	(0.0094)	(0.0658)	(0.00977)	(0.0087)
NoChildren	0.00781	-0.00453	-0.0169	0.00649
	(0.0115)	(0.0567)	(0.0118)	(0.0111)
Pcexphh	0.082***	0.094***	0.087**	0.019
	(0.0029)	(0.005)	(0.003)	(0.010)
Urban	0.144***	0.174**	0.102***	0.00775
	(0.0284)	(0.0727)	(0.0310)	(0.0401)
AssetIndexHH	-0.0213**	-0.0152	-0.0236**	-0.00565
	(0.0085)	(0.036)	(0.0093)	(0.0102)
CoupleAge	-0.0006	-0.00013	-0.0001	-0.001***
	(0.00048)	(0.00247)	(0.000528)	(0.00045)
Observations	2,490	2,490	2,256	2,256
Exogeneity Test				
Wald Test: Chi2		17.49		14.31
Prob>Chi2		0.0001		0.0000
Overidentifying Test				
Score Chi2 (ODT)		0.5732		0.0023
P-valve		0.3455		0.8375
Test of Weak Instruments				
Partial R-Square		0.0183		0.0231
Robust F		21.993		16.556
Prob>F		0.0000		0.0000

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

Table C19 Impact of Mothers' Bargaining Power on Hours of Class Attendance

Variables	All		Rural		Urban	
	Tobit	IV-Tobit	Tobit	IV-Tobit	Tobit	IV-Tobit
MBP	0.547***	6.42***	0.543***	9.128***	-0.522*	1.202
	(0.142)	(2.697)	(0.159)	(2.105)	(0.301)	(2.258)
Age	0.144	0.379	0.243	4.389	-0.0261	0.0165
	(0.184)	(0.363)	(0.203)	(32.93)	(0.387)	(0.393)
Age2	0.0016	-0.012	-0.0048	-0.181	0.0142	0.0124
	(0.0091)	(0.0179)	(0.0101)	(1.378)	(0.0195)	(0.0197)
Boy	0.148	0.559	0.244	1.111	-0.0363	-0.196
	(0.301)	(0.576)	(0.331)	(9.132)	(0.643)	(0.681)
Ownland	-1.168**	-2.49**	-1.89***	0.516	-0.199	0.252
	(0.477)	(1.268)	(0.642)	(12.93)	(0.705)	(0.854)
MaleHead	0.642	-1.183	-1.701	-47.98	3.987**	3.567**
	(1.158)	(1.953)	(1.430)	(361.7)	(1.716)	(1.773)
HHsize	-0.236	0.453	-0.240	10.82	-0.399	-0.344
	(0.158)	(0.446)	(0.183)	(83.41)	(0.307)	(0.313)
NoChildren	0.301	-0.558	0.381*	-13.82	-0.0235	-0.167
	(0.189)	(0.547)	(0.218)	(106.7)	(0.397)	(0.445)
Pcexphh	0.0007*	0.0018*	0.0013**	0.0136	-0.00029	-0.0004
	(0.0004)	(0.0010)	(0.00057)	(0.100)	(0.00079)	(0.0008)
Urban	-1.62***	0.536	-	-	-	-
	(0.466)	(1.328)	-	-	-	-
AssetIndexHH	-0.118	0.169	-0.265*	0.812	0.539*	0.444
	(0.137)	(0.278)	(0.154)	(7.424)	(0.307)	(0.347)
CoupleAge	0.00085	0.0417	0.0038	0.301	-0.0034	-0.0118
	(0.0081)	(0.0279)	(0.00886)	(2.283)	(0.0196)	(0.0215)
Observations	3,569	3,569	2,613	2,613	956	956
Exogeneity Test						
Wald Test: Chi2		8.6		12.79		0.13
Prob>Chi2		0.0051		0.0005		0.6595
Overidentifying Test						
Score Chi2 (ODT)		6.318		1.2777		0.4361
P-valve		0.5671		0.1814		0.6513
Test of Weak Instruments						
Partial R-Square		0.012		0.011		0.0182
Robust F		22.916		18.281		20.712
Prob>F		0.0000		0.0000		0.0000

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

Table C20 Impact of Mothers' Bargaining Power on Hours of Class Attendance

Variables	Boys		Girls	
	Tobit	IV-Tobit	Tobit	IV-Tobit
MBP	0.745	1.421	1.313***	8.05***
	(1.190)	(3.704)	(0.211)	(1.508)
Age	0.0218	0.0805	0.310	-0.585
	(0.240)	(0.312)	(0.284)	(0.777)
Age2	0.00927	0.00713	-0.00839	0.0347
	(0.0119)	(0.0155)	(0.0144)	(0.0391)
Ownland	-1.961***	-2.100***	-0.300	3.161
	(0.628)	(0.786)	(0.729)	(2.784)
MaleHead	-0.740	-1.048	2.255	-1.688
	(1.353)	(1.808)	(1.876)	(3.340)
HHsize	-0.344	0.292	-0.108	-0.107
	(0.212)	(0.378)	(0.233)	(0.329)
NoChildren	0.405	-0.364	0.174	0.509
	(0.253)	(0.456)	(0.279)	(0.485)
Pcexphh	0.00069	0.0014*	0.00089	0.00027
	(0.00058)	(0.00073)	(0.0007)	(0.0011)
Urban	-2.240***	-0.374	-0.979	-3.782
	(0.614)	(1.170)	(0.709)	(2.577)
AssetIndexHH	-0.270	-0.0642	0.0561	-0.358
	(0.177)	(0.234)	(0.213)	(0.454)
CoupleAge	0.00776	0.0228	-0.00718	-0.0591
	(0.0109)	(0.0149)	(0.0119)	(0.0453)
Observations	1,915	1,915	1,654	1,654
Exogeneity Test				
Wald Test: Chi2		1.47		4.99
Prob>Chi2		0.0371		0.0178
Overidentifying Test				
Score Chi2 (ODT)		9.119		0.4115
P-valve		0.5777		0.6711
Test of Weak Instruments				
Partial R-Square		0.0381		0.0301
Robust F		17.12		16.239
Prob>F		0.0000		0.0001

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

Table C21 Impact of Mothers' Bargaining Power on Child Labour

Variables	Participation		Hours	
Variables	Probit	IV-Probit	Tobit	IV-Tobit
MBP	-0.0274**	-0.041***	-2.127***	5.756
	(0.0136)	(0.0107)	(0.204)	(3.900)
Average Age	0.0072	0.0076	0.130	-0.0334
	(0.0069)	(0.0091)	(0.104)	(0.160)
Average Age2	-0.007	-0.0075	-0.0017**	-0.0003
	(0.0059)	(0.0076)	(0.00081)	(0.0013)
PropBoys	-0.194	-0.190	-1.720	-3.703
	(0.149)	(0.163)	(3.188)	(3.726)
Ownland	0.866***	0.864***	14.95***	16.38***
	(0.110)	(0.110)	(2.283)	(2.560)
HHsize	0.0284*	0.0290	0.294	0.0540
	(0.0154)	(0.0176)	(0.213)	(0.302)
NoChildren	0.00414	0.00339	0.111	0.436
	(0.0189)	(0.0218)	(0.269)	(0.397)
Pcexphh	-0.0011**	-0.00012**	-0.0015**	-0.0017**
	(0.0004)	(0.0004)	(0.0007)	(0.00088)
Urban	-0.123***	-0.121**	-1.432*	-2.441**
	(0.0453)	(0.0582)	(0.787)	(1.227)
AssetIndexHH	0.0111	0.0109	0.186	0.295
	(0.0125)	(0.0131)	(0.199)	(0.270)
CoupleAge	0.00185	0.00188	0.0474	0.0354
	(0.00194)	(0.00202)	(0.0307)	(0.0355)
Observations	1,462	1,462	1,462	1,462
Exogeneity Test				
Wald Test: Chi2		1.89		0.04
Prob>Chi2		0.021		0.9743
Overidentifying Test				
Score Chi2 (ODT)		0.0231		7.561
P-valve		0.9182		0.0041
Test of Weak Instruments				
Partial R-Square		0.0101		0.0081
Robust F		14.357		5.129
Prob>F		0.0005		0.011

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