MIGRATION, REMITTANCES AND HUMAN CAPITAL DEVELOPMENT IN GHANA

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ENYONAM AKOSUA GANYO

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Members of the Examining Committee:

Natascha Wagner

Lorenzo Pellegrini

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Inquiries:

Postal address:

Institute of Social Studies
P.O. Box 29776
2502 LT The Hague
The Netherlands

Location:

Kortenaerkade 12
2518 AX The Hague
The Netherlands

Telephone: +31 70 426 0460
Fax: +31 70 426 0799

Dedication

To my family, Komla, Mansa, Senyo and Aku Ganyo.

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List of Acronyms

CMP	The Conditional (Recursive) Mixed Process estimator
DWH	Durbin-Wu-Hausman
ECOWAS	Economic Community of West African States
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GLSS	Ghana Living Standard Survey
ODA	Official Development Assistance
OLS	Ordinary Least Squares
SAP	Structural Adjustment Policy
SSA	Sub-Saharan Africa
UNDP	United Nations Development Programme

Abstract

In the past few decades, there has been a steady increase in the amount of remittances to most developing countries, often surpassing the amount of development aid. In Ghana, remittances have become an important source of income to most households. However, there has been little or no empirical work to look at the effect of remittances on human capital development in Ghana. This paper aims to explore the extent to which Ghanaian households have used remittances in developing the human capital capacity of children between 5 and 19. School enrolment, years of schooling completed, expenditure on education and number of children enrolled in school are used as a measure of human capital.

Instrumental variables approach is used to overcome the endogeneity problems associated with remittances. The choice of instruments used is correlated with remittances but will only affect human capital through its effects on remittances. The instruments used are number of remitters to the household and an interaction between the number of bank branches and origin of remittances. The interaction between the two variables shows variations in labour market outcomes at the home community and the destination of the migrant, and costs associated with receiving remittances, hence explaining why different households with similar characteristics will receive varying amounts of income from remittances.

After resolving the issues associated with endogeneity, the main conclusion from the analysis is that, to a large extent remittances have a positive and significant impact on all outcome variables of interest, with rural households experiencing the largest effects of the impact of remittances on probability of school enrolment, number of children in school and years of schooling completed. The results also indicate that not using instruments to estimate the coefficients will lead to the over estimations of the results. The extent of overestimation is given by the coefficient of transformed ϱ (atanhrho_12) and range from 2.6 to 34.2 per cent.

Relevance to Development Studies

The economic prosperity of any society hinges on its stock of human capital. However, without education, the amount of human capital needed for economic development cannot be achieved. Education is not only demanded in itself but the possibilities it has in resulting in better economic prospects for those who receive it. It also results in improved citizens and leads to an increase in the standard of living of beneficiaries. In light of these views of education as a means of change, households in Ghana are increasing investment in education. Because education is not easily obtainable, it has been regarded as an economic commodity. Like any other economic good, investment in education faces competition from other economic goods that are consumed by households. Remittances however serve as a means of easing the constraints households face. It is therefore necessary to study the impact of remittances on investment in education in Ghana.

Keywords

Remittances, Ghana, human capital, migration, educational attainment

Chapter 1 Introduction

1.0 Introduction to the Study

The repatriated earnings of migrant workers generally referred to as remittances, have become an important source of finance for many developing countries and in Ghana, the story is in no different. They represent the second most important source of development financing for most of these countries (World Bank 2004)[1]. Ghana has seen a steady increase in the flow of remittances over the past 25 years. Orozco (2002) has predicted that in light of the continued migration of people from poor countries to richer ones, remittances will persist. Remittances represent a relatively stable market-based external supply of financing development. For many Ghanaian households, migrant remittances have become a form of insurance especially in times of macroeconomics disturbances. According to the Bank of Ghana, migrant remittances are becoming an important source of external finance and the share of remittances in Gross Domestic Product (GDP) is growing faster than the share of Foreign Direct Investment (FDI) and Official Development Assistance (ODA) in GDP.

Three views have been presented in the literature on the impact of remittances on economic development. One school of thought argues that remittances are fungible (Adams et al. 2008) and as such are spent and treated like any other kind of income by households. The second view presents a more pessimistic view of remittances arguing that they are mainly used for current consumption, promote dependency among receipts and would have no developmental impact compared to other sources of income. However, the third school of thought presents the optimist view that argues that compared to other forms of income; remittances actually increase investment in physical and human capital.

This paper is in line with the third view with particular interest in the relationship between remittances and human capital development, with a focus on the extent to which remittances have been used to finance education in Ghana. In most low income countries, income plays an important role in household decisions to enrol children in school. In Ghana, household decisions to enrol children in school are greatly affected by resource constraints and imperfect capital markets. Remittances tend to help remove these financial constraints; hence one would expect greater human capital among remittances receiving households. Education being a normal good, the expectation is that if remittances lead to an increase in household income, more of it will be consumed. However, remittances are likely to have both negative and positive effects on the educational attainment of children (Hanson and Woodruff 2003). Alternatively, remittances may have differential effects for both boys and girls, especially in a patriarchal system like Ghana. This possibility is taken into account by allowing for the fact that parents will prefer to educate boys more in comparison with girls since they (boys) face greater responsibilities in caring for their elderly parents. Thus education of boys will lead to the provision of fi-

[1] The most important source of development financing is FDI

nancial support for parents in their old age. This paper uses the last three waves of the nationally representative living standard survey to provide statistically robust evidence in line with the above objectives.

Studies on the impact of remittances on educational attainment in developing countries have shown that remittances lead to an increase in educational attainment through the effect on household income. For instance, in studying the relationship between educational attainment and the household migration in Mexico, Hanson and Woodruff (2003) found that children from migrant households have more years of education. They also found that girls between the ages of 10 and 15 years from remittance receiving households tend to have between 0.2 and 0.9 more years of education but only if the parents had low levels of education. Acosta (2006) using data from El Salvador also finds that under-15 year old boys and girls from remittance-receiving households were more likely to be enrolled in school compared to their counterparts from non-remittances-receiving households. His study also revealed that there were gendered differences in the use of remittances across and possibly within households. Using data from Ecuador, Calero et al. (2009) find that remittances lead to an increase in school enrolment and a decline in child labour. Their research indicates that the effects are greatest for people living in rural areas and for girls. They further find that aggregate household shocks such as drought, plagues and death lead to a rise in the incidence of work among children but remittances however enables households to finance education in the face of these shocks. Their result is an indication that low income levels affect investment decision in educating girls as well as rural households. Edwards and Ureta (2003) using data from El Salvador find that remittances led to a reduction in the likelihood of children between 6 and 14 dropping out of school.

Even though all the above studies show that migration and hence remittances have a positive effect on educational outcomes, other studies however have presented mixed results. For instance, using data on Mexico, McKenzie and Rapoport (2011) find a negative impact of migrant monetary flows on school enrolment for girls between the ages of 16 and 18. The difference between the study by Hanson and Woodruff (2003) and McKenzie and Rapoport (2011) lies in the data set that was used. Whereas the former used the 2000 Mexican census data, the latter used a large demographic data which allowed for the evaluation of a much broader degree of migration experience. Another strength McKenzie and Rapoport's (2011) research has over Hanson and Woodruff (2003) is that they take into account the high rate of right censoring which leads to the insignificant results of Hanson and Woodruff (2003) for 12-15 year olds to become significant. Lopez-Cordova using a cross-section of data from Mexican municipalities found that for children between the ages of 6 and 14, remittances lead to an increase in school enrolment but negatively affected school enrolment for boys between 15 and 17. Using data from 11 Latin American and Caribbean countries, Fajnzylber and Lopez (2007) find that children from remittance receiving households in only six[2] out of the eleven countries were more likely to go to school. Their results also indicate that children with mothers who have low levels or no education experienced higher effects.

[2] Honduras, Guatemala, Haiti, Ecuador, Nicaragua and El Salvador

An important issue that has to be taken into account when dealing with migration and remittances study is the fact that migration and hence remittances decisions are not exogenous to households. It must also be noted from the beginning that comparing expenditures of both remittance receiving and non-remittance receiving households on the basis of observed characteristics will be biased since unobserved household characteristics such as motivation, skills and ability differ remarkably. This raises the problem of endogeneity. Not dealing with the endogeneity[3] inherent to remittances and migration would result in biased estimates. This paper employs the instrumental variables approach to address the problem of endogeneity. The approach utilises the interaction between number of regional bank branches and origin of remittances as well as the total number of remitters to a household.

We use repeated cross-section of the last three waves of GLSS to explore the relationship between human capita and remittances. The main findings from the analysis indicate that receiving remittance increases the probability of households sending children to school. Receiving remittances also increase expenditure on education, number of children households send to school and the number of years of schooling children from these households complete.

1.1 Objectives of the Study

The main objective of this study is to determine the extent to which remittances have supported human capital development in the Ghana. Specifically, the study will seek:

- To assess the depth of remittances application to education and skills training
- To examine the scale effects of remittances on migrant households in Ghana

1.2 Research Questions

The key question that will guide this study is the:

To what extents are remittances financing human capital development in Ghana? Specific questions include:

- What is the contribution of remittances to human capital?
- To what extent are remittances financing education and skills training?
- Are children from migrant households more likely to stay in school longer?

The paper examines the effects of the remittances on education for children living in these households. The main focus is on school-aged between the ages of 5 and 19.

3 Section 4.2 Endogeneity and the Need to Instrument discusses the issue of endogeneity and the instrument used to resolve endogeneity

The rest of the paper is organized as follows. The next section looks at the flow of remittances to developing countries. Chapter 2 looks at the context of migration and remittances in Ghana, followed by Chapter 3 focusing on the theoretical framework of human capital model. Chapters 4, 5, 6 and 7 discuss the empirical model, data, descriptive statistics, results and conclusion respectively.

1.3 Flow of Remittances to Developing Countries

Worldwide, there are about 215 million international migrants (World Bank Group 2011). These migrants usually send money and food back home to their families and households in their countries of origin. The food and money sent home by migrants are commonly referred to as remittances (Adams 1991). Not only do remittances serve as an important source of income for migrant households but they also serve as an important source of foreign income for the countries of origin. Migration is also important for development because not only do the households of these migrants benefit from the remittances but the sending countries also benefit through increases in foreign exchange inflows, reductions in labour market pressures as well as contacts with international markets and access to technology (World Bank 2006). Despite these positive effects associated with migration, there are aspects that are not always desirable. Migration leads to brain-drain which can serve as a hindrance[4] to development, especially in developing countries (World Bank 2006). In some cases, migrants are taken advantage off and badly treated. For instance, Filipino housemaids have been sexually abused by their local employers in Saudi Arabia, the murder of Nepalese contract workers in Iraq in 2004 and racism against Ethiopian migrants in Isreal (Kapiszewski 2006)

Although the actual size of international migrant remittances is far in excess of reported figures due to unreported[5] flows (World Bank Group 2011), there has been an increase in the international flows of remittances over the past two decades. In 2006, in its Global Economic Prospects, the World Bank estimated that in 1990, remittance flow to developing countries was in the range of $30 billion[6] (World Bank 2006). Between 1990 and 2005, remittances were estimated to be in the region of $170 billion, implying annual growth rates above 10% and by 2007, had accounted for 30% of financial flows to developing countries (Acosta et al. 2007). By 2007 the total remittance flow to the developing world increased to $265 billion, an increase of 16% from the

[4] There is the view in the early literature that suggests that skilled migration is bad for those left behind especially if the education of the former was either partly or fully funded by taxes on residents or their economic contribution is more than the marginal product (Docquier and Marfouk 2006). For more on this view see (Kwok and Leland 1982, Bhagwati and Hamada 1974).

[5] Due to under reporting of remittances and informal remittance flows in most developing countries, remittances are greatly underestimated. According to the World Bank (2011), world remittance flows in 2010 exceeded $440 billion. This amount would be much higher if unrecorded figures from formal and informal channels were added. As a result, the most cumbersome part of gathering data on remittances is estimating these informal flows.

[6] All amounts are in United States Dollars (USD)

2006 figure of $229 billion (Ratha et al. 2008). Even though there was a slowdown in remittances in the last quarter of 2008 due to the financial crisis, the overall flow of remittances reached $328 billion. In 2009 however, there was a decline of -4.80% in remittances bringing the total to $308 billion (Ratha and Siwal 2012). In 2010, 2011 and 2012 remittances to developing countries increased to $341, $380 and $ 401 billion respectively, indicating growth rates of 8.0, 11.5 and 5.3% respectively and are expected to increase by 6.7, 9.5 and 10.2% between 2013 and 2015 (World Bank 2012).

Whereas the recorded value of remittances is much lower than the flow of official development assistance (ODA) and foreign direct investment (FDI) (Gupta et al. 2009), they are more stable and reliable (Quartey 2006, Addison 2005, Kapur 2009, Ratha et al. 2009). As a result, remittances can reduce the cost of borrowing as well as enable access to foreign capital. Unlike ODA and FDI, remittances have the advantage of lessening the impact of Dutch Disease as they are widely spread. Despite these advantages, remittances however have the risks of appreciating the exchange rate and can lead to exports from the concerned countries becoming less competitive on the world market (Gupta et al. 2009).

The total volume of remittances to developing countries in 2001 was $ 72.3 billion, nearly one and half times net ODA in that year ($ 52 billion) and almost half the net private flows (FDI plus debt flows) of nearly $ 153 billion (Kapur 2009, Irving et al. 2010). In 2005, they totalled $188 billion, twice the amount of official assistance developing countries received - $93 billion (Gupta et al. 2009). Acosta et al (2007) indicated that remittances accounted for an average of 2.5% of the gross national income of all developing countries.

Studies on remittances (Sander 2003, Gupta et al. 2009, Quartey 2006) reported the flow of remittances to developing countries to be more stable than other external sources of development finance (ODA, FDI and private capital flows). Migrants are motivated by altruism and remit more money home in times of economic distress, making remittances countercyclical in nature. There are, however, marked regional differences in remittance flows to developing countries. In 2002, Latin America and the Caribbean had the highest level of remittances, estimated at $ 25 billion, followed by South Asia with $ 16 billion and the Middle East and North Africa receiving $14 billion. Sub-Saharan Africa accounted for the lowest level of remittances amounting to $4 billion (Solimano 2003). According to Gupta et al (2009), India, China and Mexico are the top three recipients of remittances with $ 14.8, $ 14.4 and $ 11.5 million respectively (Organisation of Economic Co-operation and Development 2006). Together, these three countries which also happen to be the most populous in the world, accounted for more than one-third of all remittances to the developing world.

In 2002, the global remittances average was $28.53 million (Organisation of Economic Co-operation and Development 2006). While the Middle East, Latin America and Eastern Europe received 305%, 210% and 165% respectively of the global average, Asia and Africa 72% and 61% of the global average (ibid). Remittance distribution is even more unequal when it comes to individual country comparisons. The 5 developing countries with the highest per capita remittances received in 2002 are Israel $583, Tonga $563, Barbados $516, Jamaica $510 and Jordan $413 (Organisation of Economic Co-operation and Development 2006).

Development practitioners currently view remittances as playing an important role in supporting development efforts of recipient countries through two main channels (Mansuri 2007). First remittances can directly flow to the population that is in most need. In such cases, remittances have a direct and significant impact on poverty reduction. Even if the poorest households spend all remittances on consumption, there is still a positive welfare effect because remittances increase their consumption. Remittances are also believed to contribute to an increase in human and physical capital investment in developing countries. Remittances have the potential of removing financial constraints that households and entrepreneurs face in their attempts to invest (Acosta et al. 2007, Irving et al. 2010). Remittances equally serve as a means of insurance for households thereby allowing them the opportunity to pursue riskier asset accumulation strategies (Acosta et al. 2007). In this regard, remittances contribute to raise the long-run growth possibilities of a country through higher rates of investment in both human and physical capital.

Chapter 2 The Ghanaian Context of Migration and Remittances

2.0 Introduction

Ghana has had a long history of migration. However, much of the migration before and during the 1960's was mostly within the country (Awumbila et al. 2008). The few Ghanaians who migrated abroad during this time were mostly members of the elite class who gained from the expansion of economic opportunities. These small elites mostly left to take advantage of higher education or training opportunities abroad. Migration and hence remittances are increasingly becoming an important means of alternative livelihood strategy for many Ghanaian households. The Nigerian oil boom of the 1970s with its attendant increased labour demand led to the mass exodus of Ghanaians. This phenomenon led to new claims to social status among households who received remittances (Akyeampong 2000).

Once the economy of Ghana started deteriorating in the mid-1960s, Ghanaians started migrating to Ivory Coast in search of jobs in the agricultural sector. By 1970s, when there was further economic deterioration, groups of professionals such as lawyers, teachers, doctors and administrators started migrating to other Anglophone West African countries. Notable among these countries was Nigeria because comparatively, it had a booming economy due to the oil price shock. The establishment of the Economic Community of West African States (ECOWAS) in the 1980s and the continued economic decline of the Ghanaian economy led to migration of more unskilled and skilled labour out of the country.

1983 marked the lowest point in Ghana's migration and the beginning of unprecedented emigration of Ghanaians. Three factors namely, the 1983 drought that affected most parts of the country, the expelling of more than a million Ghanaians from Nigeria and the implementation of Structural Adjustment Programe (SAP) as a World Bank condition to acquire loans, contributed to this increased emigration during the early 1980s. Although the implementation of SAP led to improvement in Ghana's economic situation[7], it however resulted in increased unemployment, underemployment and labour redundancies. The fall in government expenditures and provision of social services led to an increase in inequality and a devaluation of the Ghanaian currency. All these led to households sending members abroad as a coping mechanism. The collapse of apartheid in South Africa in 1990 and increased migration opportunities to other West African countries made it a lot easier for Ghanaians to migrate to Europe[8], North America[9] and the Middle East (Akyeampong 2000).

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7 The introduction of SAP led to GDP growing at 4-6% annual, up from 1.5 in 1983, 2% increase in per capita income, inflation declining from 123% in 1984 to 10% in 1991. See Aryeetey and Harrigan (2000) for more on SAP in Ghana

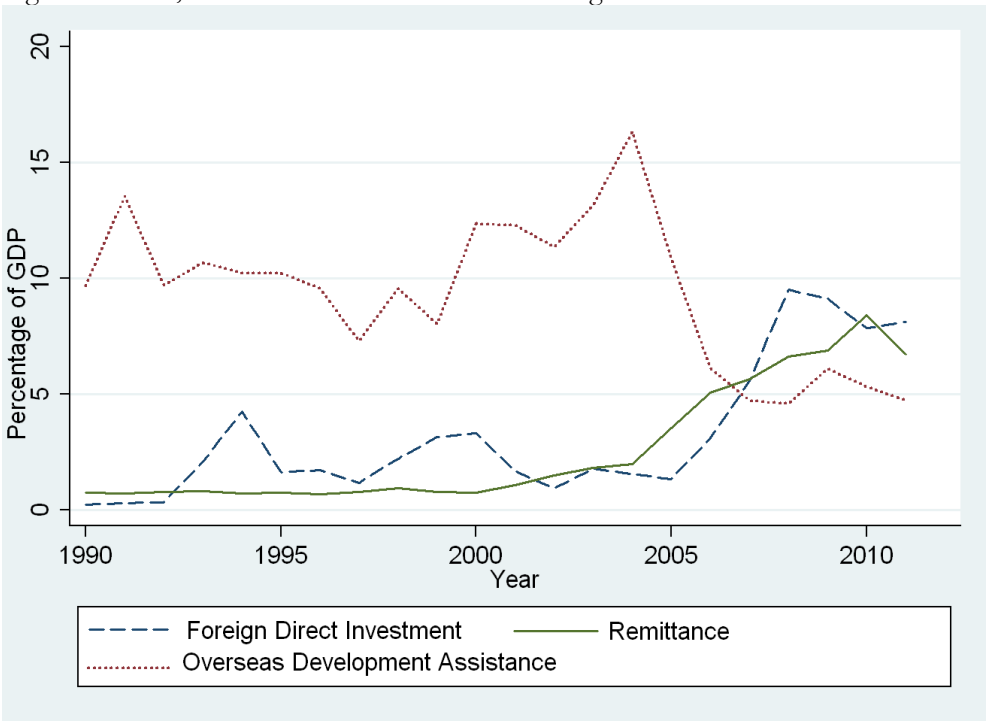
8 Major European destinations include The UK, Germany, Italy and the Netherlands65

Since 2003, Ghana's national income has grown steadily from US$320 million to $US 1.55 billion in 2012 (World Bank Coverage: 1960-2012). The country has also experienced a positive and increasing GDP growth rate since the institution of economic reforms in the 1983. Between 1995 and 2005, the country experienced an average GDP growth rate of 4.7 (Institute of Statistical, Social and Economic Research 2008) and 6.4% between 2006 and 2010 (World Bank Coverage: 1960-2012). Driven by the services sector, oil revenues, and the strong performance of gold and cocoa on the export market, GDP grew by 14.4% (OECD et al. 2013) in 2012. The medium term growth is expected to remain at 8.0 and 8.7% in 2013 and 2014 driven by investments in public infrastructure, commercial agriculture and oil and gas sectors. In 2010, the World Bank classified Ghana as a low middle income country. Despite this, Ghana's development indicators compares poorly to other countries in the same income group.

The last two decades have seen new trends in the migration dynamics of the country due to shifts in the global political economy and globalisation. Remittances can have a profound effect on income distribution, poverty and the development of the economies of recipient households and communities. They make up 2-17% of the economies of receiving households in the data used for this paper. Remittances sent by migrants to their families and relatives are an important means for Ghanaians to maintain ties with their home communities. Remittances also serve as an important and the third highest source of foreign revenue for the government of Ghana (Akyeampong 2000). According to the World Bank, remittances are relatively stable compared to other sources of income such as FDI and ODA. The situation is not very different in Ghana. Although remittances are much lower than the flow of ODA and FDI, the flow is relatively stable. Figure 1 shows a graph of the flow of ODA, FDI and remittances as a share of GDP.

9Canada became an attractive option for a lot of Ghanaian migrants when Europe begun tightening its migration policies while Canada was making relaxing it immigration policies between 1960 and 1980s (Konadu-Agyemang 1999).

Figure 1: ODA, FDI and Remittances as a Percentage of GDP



Source: World Bank World Development Indicators

2.1 Migration and Remittances in Ghana

There is considerable interest among development practitioners, researchers and policy makers to understand the extent to which international remittances have been used to finance development in middle and low income countries such as Ghana. This phenomenon is due to the size, forms and evolutions which remittances have undergone over the last few decades. In Ghana, a number of studies have been conducted by development researchers, policy advisors, and international development agencies on remittances and their application to household/community development financing. Studies have revealed that migrant remittances are spent on household consumption, education, debt repayment, financing of projects and investment in small-businesses (Manu 2006, Gyimah-Brempong and Asiedu 2011, Owiafe 2008). Quartey (2006) and Owiafe (2008) in their respective studies on remittances and household welfare found that the flow of remittances to Ghana was counter-cyclical in nature; in that they increase in times of economic distress and work as a consumption smoothing mechanism and an informal stabilization fund.

In Ghana, there is strong anecdotal evidence linking migration and remittances (Boakye-Yiadom 2008). Deeply seated at the heart of migration and remittance flows is the extended family system and the household decision making. Usually, the average Ghanaian household is made up of multigenerational individuals. In such situations, the financial constraints educating one child beyond the basic level would usually be to the disadvantage of other children in the house. Before families make such decisions, factors such as ability, gender and academic promise are taken into consideration. These educated members are more likely to migrate since they having higher propensities to find jobs at

the destination. Household might provide support towards migration with the understanding that all support provided towards education and migration is reciprocated. The migrant is obliged to return the favour under these circumstances. Although it is possible that migrants will not fulfil these obligations, it is usually not likely. Compliance is linked to migrants' altruistic tendencies towards the rest of the family which in turn is inculcated through strong families. The fear of being socially ostracised also leads to fulfilment of these obligations by the migrant. The exchange of visits and in recent times, phone calls, emails and text messages have helped strengthen relations between migrants and those left behind. This has led to increases in remittances

In studying the macroeconomic effects of remittances on Ghana's economy using balance of payments (BOP) estimates of private remittances transfers, Addison (2005) found that private transfers (remittances) to Ghana were larger and steadier than foreign direct investment (FDI) and official development assistance (ODA). He also found that the flow of remittances to Ghana increased more than export earnings and GDP and led to a significant improvement in the country's balance of payment.

Adams et al. (2008) investigated how the receipt of internal and international remittances impacted the spending behaviours of households in terms of investment and consumption of goods including education, food and housing. Their study revealed that households in Ghana did not treat remittances any differently from other income sources. There was no significant change in marginal spending patterns for households with and without remittance income. However, a study conducted in Ghana and Senegal revealed that households that received remittances increased their access to land particularly for residential purposes (Cotula et al. 2004).

Even though most of these researches identified that remittances to Ghana are help reduce the level and extent of poverty, contribute to GDP growth, little is known in terms of a comprehensive study that assessed the relationship and the extent to which migrant remittances are financing human capital development in Ghana. To fill this research gap and to also contribute to the remittance-development nexus in Ghana, this study will be geared towards the relationship and extent to which migrant remittances are` financing human capital development in the area of education.

This study will be conducted using the last three waves of the Ghana Living Standard Surveys (GLSS) from Ghana. The data set is nationally representative with good representation of migrant households.

Chapter 3 Human Capital

3.0 Introduction

The use of the term human capital is usually in reference to the embodiment of factors such as health, on-the-job training, nutrition and formal education that are inherent in a person with the potential of leading to future advantages (Bardhan and Udry 1999: chapter 10). A great deal of attention has been focused on the role of the expenditure on health and education as investments. People do not demand health and education for their own sake but for the benefit of generating higher incomes in the future. Educational attainment, nutrition and health have long been hypothesized by economists as having the potential to increase people's labour power.

The level of human capital embodied in a nation is measured by the Human Development Index developed by the United Nations Development Programme (UNDP). The index summarises the following three dimensions of human capital namely knowledge measured by school enrolment and literacy, having a good standard of living measured by per capita GDP and purchasing power parity and quality of life measured by life expectancy.

The Theory of Human Capital Development states that greater economic production hence growth can only be achieved through investment in the development of human capital. This is contrary to the general belief in the past. In the past, the strength of an economy was based on the amount of investment in physical and tangible assets such as factories, capital, machinery and land. Although labour was thought of as an important component in the production process, it was not regarded as very important in increasing growth. Rather, the growths in economic activities were thought to come from investments in capital goods and equipment. Contemporary economists however disagree with the old notion about growth (Becker 1994). According to them, the crucial factors in promoting human capital and eventually growth are health care and education.

Adam Smith and William Petty are usually recognised as the inventors of the human capital theory. Petty (1769) investigated the state's role in economic development and labour's value. Smith (1776) linked national prosperity to the increasing division of labour. According to Becker and Murphy (1992), Smith is usually referred to as the first person to have made a connection between higher wages and skills of the worker.

The development process of any country or economy is dependent on enhancements in the education and health of its people. Since time immemorial, it has been shown that people place a great significance on their health and education and that of their family members. No country can therefore ignore this important fact and hope to make any progress whatsoever towards development. The education and health of an individual not only impacts that person's ability to produce but also has the potential of impacting on those immediately around him/her. A country or economy with better educated and healthier population is able to produce more output (Bardhan and Udry 1999: chapter 10). This higher productivity is translated into increased income for the individual and higher GDP for the economy. Countries that invest in the health

and education of their nationals are in essence strengthening the prospects of higher incomes for the citizenry and GDP for the economy as a whole.

The wide disparity of health and education attainment between the rich and poor is an indication of the extent of inequality in any country, especially in developing countries. Whereas the rich or relatively well-off citizens are able to afford and invest in their human capital thereby leading to increase in their incomes, the poor are unable to do the same. The combined effects of income and human capital on one hand and increasing returns on investment in human capital and imperfect credit markets in developing countries on the other hand, lead to the creation and perpetuation of poverty traps in these countries. There is therefore a positive association between household/individual income, education and health status. However, the positive demand elasticity is between the parts of human capital and not the straightforward link between productivity and human capital (Bardhan and Udry 1999).

Although human capital is more complex and entails more than education and health, this analysis however only uses education as a proxy and hence does not investigate the broader perspective of the concept. This limitation is as a result of the difficulty in accessing data on health indicators from Ghana.

3.1 Uses of Human Capital

In labour economics, human capital is considered to be a set of characteristics or skills that increases the productivity of a worker. Different authors in the field have come up with alternative ways of thinking about human capital. Gary Becker views human capital as directly beneficial in the production of goods and services. According to him, human capital tends to increase the productivity of a worker in all duties and situations. Although this view considers the role of human capital in the production process as complex, it can be assumed to be characterised by a one-dimensional object, such as the stock of skills or knowledge that is embodied in an individual that is directly part of the production function.

Gardner on the other hand warns of the dangers of thinking about human capital as one-dimensional. In his opinion, it is because there are many types and dimensions to skills and knowledge (Gardner 1985). An example of his view is the importance placed on the difference between the physical and mental capabilities of people. One of Gardner's contribution to the human capital theory is the development of the theory of multiple-intelligences which focused on the fact that there were many geniuses and famous people in some areas but not skilled in others.

The Schultz/Nelson-Phelps' view of human capital is mostly thought of as the capacity of people to adapt (Nelson and Phelps 1966). The approach used here is particularly useful in situations of changing environment of disequilibrium when it is important for workers to be able to quickly adapt their skills to meet the needs of current circumstances. Bowles and Gintis (1975) however consider human capital as the ability of an individual to work in an organisation, take and obey orders in a capitalist and hierarchical environment. They argue that the main function of education is to inculcate in students the 'correct' approach and ideology of life (Bowles and Gintis 1975).

The first three views of human capital appear to be similar in the sense that they all talk about the fact that it is valuable in the market because of its potential to increase firms' profit. The link is much more straightforward in the Schultz and Becker as well as the Gardner views. All these three views are usually combined by labour economists in most of their applications. The view by Bowles and Gintis (1975)also has similar implications as the first three. This view suggests that corporations would be willing to pay people with higher education more because they will be more useful as their education will enable them to follow orders better. These educated employees also tend to be more reliable in the firm's hierarchical ordering.

Finally, Spence (1973) states that when human capital is observable, it acts as a signal of ability than other factors that are separately useful in production. This view differs from the above ones in the sense that discernible measures tend to be rewarded because they act as signals to entrepreneurs about worker characteristics and ability.

3.3 Sources of Human Capital Differences

Different people are endowed with different levels of human capital. These differences can be attributed to the following;

Innate differences can result in diverse human capital/skills levels between workers with the same level of education. Biological research has shown that genetic factors contribute to some components of IQ. This fact leads to heterogeneity in levels of skills and human capital even if two individuals have had the same level of investment in their education as well as constraints.

A lot of research in the field of human capital has been focused on education and schooling because it is the most noticeable part of investment in an individual's human capital development. It has been shown in studies that the schooling differences account for very little in earnings implying that human capital entails more than schooling. Other factors such as ability and experience can lead to earning inequalities (Chiswick 1974). Although schooling can be considered as one of the main forms of investment in human capital, training offered on the job can also be considered an investment in labour force (Sakamoto and Chen 1992). Even if the same amount of investment were made in the education and training of two individuals, there can be no guarantees that their human capital levels will be the same. This difference can be attributed to the level of motivation that each of these two individuals have. One could have chosen to apply him\herself more than their counterpart thereby increasing their human capital levels. These unobserved skills are important in understanding the structure and the associated changes of wages. Another important factor that could affect human capital is the amount of training or experience that one is able to acquire after schooling. Firms that make investment in training their employees generally have higher output. As a result of this fact, the greater part of costs associated with on the job related training is usually borne by the firm.

3.4 Theoretical Framework of Human Capital Theory

This section presents a brief model of human capital[10]. In order to understand the factors that influence household decision in enrolling their children in school, the standard human capital model is used. Education can be considered as both a consumption good for its own sake and an investment good because of the potential financial gains (Gertler and Glewwe 1990). Most parents consider educating their children as an investment in the future of their children. Like any other investment decision, the associated costs and benefits are considered before such an investment is made. School attendance is associated with both direct and indirect cost. Both of these costs affect the amount of resources available for current household consumption. The indirect costs include the opportunity cost associated with sending children to school. Before the decision is taken, parents have to decide whether or not the expected benefits outweigh the costs. Based on the costs and benefits associated with school enrolment, the household utility function is thus given as

$$\boldsymbol{U_1 = U(s, c^*) + \gamma_1} \qquad \textbf{3-1}$$

Where U is the expected utility of the household conditional on school enrolment, s represents the benefits that the household will enjoy in the form of increased household income when they send children to school and c* represents current household consumption.

$$\boldsymbol{s = S(h, v, z)} \qquad \textbf{3-2}$$

As pointed out above, the benefits related going to school include higher future income. These benefits are however a function of the vectors of household characteristics (h), individual child characteristics (v) and school characteristics (z).

Households however do not have infinite resources in maximising their utilities. Expenditures on consumption, that is, the net of household consumption derives from the budget constraints. The household faces a budget constraint given by,

$$\boldsymbol{y = c^* + p} \qquad \textbf{3-3}$$

where y is household income and p represents the costs associated with sending children to school. Rearranging and substituting equation 7 into equation 5 gives;

$$\boldsymbol{U_1 = U\,(s, y - p)} \qquad \textbf{3-4}$$

Income affects utility through the consumption term. Households forgo current consumption when they send children to school. If a household, however, decides not to send children to school, it is because the opportunity cost to them greatly outweighs the future benefits. The two main reasons why some parents decide not to send their children to school are low educational quality, usually measured by test scores and high costs. For poor families, this can be

[10] The framework used here is similar to that used by Gertler, P. and J. Van der Gaag (1988), Bedi et al (2004) and Ponce and Vos (2004)

an immerse burden on their already limited resources. In this case, the utility function that the household faces is given by;

$$\boldsymbol{U_0 = U(c^o)} \qquad \textbf{3-5}$$

In deciding whether or not to send their children to school, the household will choose between U_1 and U_0 depending on the one that maximises their utility given their budget constraints. The utility maximisation problem therefore becomes

$$\boldsymbol{U^* = \max(U_0, U_1)} \qquad \textbf{3-6}$$

U* is the maximum utility. Getting a solution to the maximization problem therefore becomes the probability that an alternative utility is chosen.

The literature states three different utility functions. These are the linear function used by Bedi et al (2004), semi-quadratic by Gertler and Glewwe (1990) and a logarithmic utility function by Dustmann and Kirchkamp (2002). Using a linear model, the utility function thus becomes

$$\mathbf{U_1 = \omega_1 s + \omega_2 c * + \pi_1} \qquad \textbf{3-7}$$

Where $\boldsymbol{\pi}$ is the error the term with normal distribution, and $\boldsymbol{\omega}$ are the coefficients. Substituting $\boldsymbol{y = c^* + p}$

3-3 into $\mathbf{U_1 = \omega_1 s + \omega_2 c* + \pi_1}$

3-7 yields a utility function

$$\mathbf{U_1 = \omega_1 s + \omega_2 (y - p) + \pi_1} \qquad \textbf{3-8}$$

As stated earlier, one reason why parents do not send children to school is the high cost involved in sending children to school. For those households that choose not to enrol children in school, their utility function thus becomes

$$\mathbf{U_0 = \omega_2 y + \pi_0} \qquad \textbf{3-9}$$

Receiving remittances however supplement household income. All things being equal, an increase in income eases liquidity constraints and enables an increase in the probability that children will be sent to school. In this case, the utility associated with school enrolment will be higher for these households. Subtracting equation 3-9 from 3-8 yields,

$$\boldsymbol{\omega_1 s - \omega_2 y + \pi_1 - \pi_0 > 0} \qquad \textbf{3-10}$$

Households will send children to school if the utility from sending children to school higher, that is, children will be sent to school if the utility from school enrolment meets equation 3-10.

Chapter 4 Methodology

4.0 Introduction

This chapter presents a discussion of the econometric models that were used in analysing the data and some econometric issues that came up during the process. The main objective here is to find out to what extent remittances have contributed to the development of human capital in Ghana.

The data (described in the next section) provides a good basis on which to analyse the effect of remittances on human capital development in Ghana. Despite this fact, however, one important issue related to remittances that must be taken into consideration is that, remittances in themselves are not exogenous. Instead, they serve as replacement and addition to household income had the migrant not decided to go migrate, especially if the said migrant had a job in the home community before leaving. According to Acosta et al (2007), when migrant households reports incomes without remittances, the true household earnings are not represented. This is due to the fact that migration has the potential of lowering household incomes due to lost earnings. It is therefore necessary to get information on household income before migration. Like the current data set being used for this research, this information is not readily available in household surveys. One way to go around this problem is to construct a counterfactual of what household income would have been had the migrant stayed in the home country by either adding an estimate of what the migrant would contribute to household income. This can however be problematic deciding whether to use the earning function of a non-migrant for the migrant or use marginal or average earnings (McKenzie and Sasin 2007).

Another way to get around this problem would be to compare a migrant household with a non-migrant identical household by matching both households based on the propensity to migrate scores. Not taking this into account is likely to lead to an overestimation of the impact of remittances on human capital. To address this issue, Acosta et al (2007) tried to compute the counterfactual household income before migration and remittances using the reduced-form model;

$$\log \boldsymbol{Y_i} = \boldsymbol{\alpha} + \boldsymbol{\beta X_i} + \boldsymbol{\gamma HH_i} + \boldsymbol{\vartheta_i} \qquad \textbf{4-1}$$

where

Y_i is non-remittance income, HH_i is characteristics of household head and X_i represents household characteristics, that is, location and demographic variables. Unobserved characteristic and random household shocks are embedded in the error term ϑ_i. Using a subsample of non-remittance household can help in the construction of the counterfactual income for remittance receiving households. Alternatively, the problem of endogeneity associated with remittances can be overcome with the use instrumental variables. In this regard, the estimation to be used is presented below in line with the estimation.

4.1 Empirical Specification and Model Estimation

This study is focused on examining and determining the extent to which remittances contribute to human capital development in Ghana. To effectively do this, the main method of analysis applied to the data is econometric in nature. Descriptive and inferential statistics are used for the interpretation and analysis of data. Regression analyses are used to determine the nature of the relationship and the extent to which remittances influence human capital development. Education related variables such as expenditure, probability of school enrolment, years of schooling completed and number of children in school are the main dependent variables while household remittance application will be the independent variable. Other control variables such as household head, household and communal characteristics are also used. Since we use a repeated cross-section data, we include 2 years dummies.

Past studies have found migration networks to be important in decisions to migrate and receipt of remittances. In Ghana, the 2 most important associations are based on religious and ethnic groups. Ethno-religious variables are included because the sociological literature stresses the importance of family and village networks in encouraging migration. Since this is a household level study, we only include ethnicity and religion of the household head to account for the ethno-religious effects. For the religion of the household head, three categories are created based the main types of religious practices among Ghanaians. These are 1) Christianity; 2) Islam; and 3) Traditional African Religion and all others. For the ethnicity, four categories are created mostly based on geographical location. These categories are household heads belonging to the 1) Akan/Asante ethnicity[11] 2) Ga, Ewe and Guan[12]; 3) Gur, mostly located in the northern part of the country; and 4) others. The excluded category of ethnicity is the Asante ethnic group and that of religion is Christianity. This is because they represent the majority of these 2 groups and as a result, have some of the most extensive migration networks in the country. The Asantes also have a cultural heritage that requires a migrant to enable other members of the household to migrate. Key to solving the endogeneity problem is to use a set of variables that affect remittances but do not affect school enrolment. In estimating the impact of receiving remittances on school enrolment, a probit estimation is called for since both variables are dummy variables taking on the values of either 0 or 1.

4.2 Endogeneity and the Need to Instrument

In most households, decisions on labour supply, education, health, expenditure, migration and remittances are not taken independent of each other. Such decisions are jointly taken. It is therefore not surprising that factors that affect remittances and migration will also have effects on the expenditure trend of households. The characteristics that determine these decisions such as ability and motivation are usually not observable (McKenzie and Sasin 2007). The

[11] Refer to Ethnologic Maps in Appendix E for location

[12] Located to the East of the Akan speaking area in Map 2 (This group is mostly in the Volta and Greater Accra Regions

simultaneity of household decision-making process, leads to a correlation between remittances and the outcome indicators of human capital development of households. There is also the question of reverse causality. Reverse causality results in questions such as do migrant send remittances to improve human capital potentials of their households or do improved human capital potentials lead to migration of family members hence remittances. Another concern with estimation of remittances on human capital is the issue of selection bias. This is because migrants can generally be different from non-migrants and as such we cannot compare what would happen to non-migrant households if they migrate on the basis of comparing them to migrant households or the other way round (McKenzie and Sasin 2007).

This means that there are issues of endogeneity associated with remittances. To overcome them, instrumental variables are employed. The instrument used is one that is likely to affect remittances but unlikely to be correlated with human capital indicators. Some studies have used instruments such as availability of migrant networks; (Gyimah-Brempong and Asiedu 2011) while others such as Calero et al (2009) have exploited information that reflect the transactions costs and accessibility of channels of transmission, that is, the remitting countries and regional variations in formal channels of remittance transmission. The use of historical migration pattern is due to the fact that the social networks play an important role in promoting the migration of other household members (Calero et al 2009). Others (Hanson and Woodruff 2003, Acosta 2006, Mansuri 2006, Acosta et al. 2007) have used the presence of migrant networks and historical migration rates as instruments for current migration rates. Using this instrument is founded in the sociological literature relating to social networks and the propensity to migrate. In comparison to households without a history of migration, past migration patterns are likely to determine whether or not a household currently contains a migrant, hence receives remittances (McKenzie and Sasin 2007).

Hanson and Woodruff (2003) also use migrant network as an instrument. According to them, educational outcome of children can be affected if a household has a migrant through the effect on household income. The mechanism through which this works is as follows; a migrant earns more income relative to non-migrants, they then remit to supplement household income which eases credit constraints thereby enabling children to stay in school longer (Hanson and Woodruff 2003). This instrument however does not explain why there are variations in the amount and frequency of remittances between identical households.

A better instrument that explains variations and frequency of remittances to different households is the use of availability of formal channels of receiving remittances. Not only does this explain the accessibility of formal channels to households but also the cost involved in accessing those channels. For example, Calero et al (2009) used origin of remittances to capture the differences in labour market outcomes between destination and home to explain why one household will receive more remittances in comparison to another household with similar characteristics. Amuendo-Dorantes and Pozo (2006) also used the interaction of per capita Western Union money transfer operators and household member education as instrument for remittances as a way of helping explain variations of remittances between different households. A general con-

cern is that the interaction of household characteristics with other variables may weaken the instrument.

A good instrument can reduce bias that results from omitted variable, selection and endogeneity. However, getting a good instrument for migration and remittances can be quite a challenge. There was a great challenge in finding an instrument from the data set that was correlated with migration and remittances but only affects human capital through its effects on remittances. Initially, the idea was to use availability of money transfer operators in each district and the distance to the nearest operator as an instrument. These variables were decided on to reflect the cost associated with receiving remittances thereby explaining the volume and frequency of sending remittances. A number of instruments such as net migration at the regional level, distance to the nearest bank or post office were experimented with but none of them came up significant.

For this paper, the interaction between the number of bank branches operating money transfer services and the origin of remittances is used as an instrument. The origin of remittances is used as a proxy for differences in labour market outcomes such as wages, costs associated with sending remittances and ease at which a migrant can find a job at the destination. This explains the variations in and the frequency that different households will receive remittances. The other instrument that explains the variation in total remittances received by households is the total number of people sending remittances to household. The number of remitters as an instrument meets the criteria set by McKenzie and Sasin (2007) and also explains total household remittances income as one would expect that households with more remitters would receive more remittances. The number of remitters is correlated with remittances but not correlated with human capital hence it can only affect human capital through its effect on remittances.

To test whether or not ordinary least squares (OLS) are inconsistent hence check for the endogeneity of remittances and the need to instrument, the Durbin-Wu-Hausman (DWH) test is performed. The test came out to be highly significant leading to a rejection of the null hypothesis. This indicates that using OLS will lead to inconsistent estimates. This therefore calls for the use of instruments as remittances are endogenous. Even if the null hypothesis of the DWH test had not been rejected, it would still be necessary to instrument as remittances have been identified in the literature to be endogenous. The Sargan-Hansen test is also performed to check the validity of the instruments. In all cases, the over-identification test is not rejected at 5% significance level. This implies that the instruments are valid.

4.3 Empirical Specification and Model Estimation

Households sending children to school is a function of household and socio-demographical characteristics, school quality and costs involved. The empirical analysis used in this paper is based on the following reduced form specification based on linear probability model can thus be written as;

$$\text{prob}(y_i = 1) = \text{prob}(y_i * \geq 0) = \beta_0 + \beta_1 R_i + \beta_2 \lambda_i + \beta_3 \delta_i + \beta_4 \mu_i + \beta_5 \varphi_i + \varepsilon_i \quad \text{4-2}$$

where βi are the coefficients to be estimated. y* is a dichotomous variable that takes on the value of 1 if a household has at least one child enrolled in school and 0 otherwise. Ri represents remittances to households. Due to potential bias related to the reported remittance incomes to households, the paper only measures remittances as a dichotomous variable of whether a household receives remittance (in which case it is 1) or not (then it becomes 0).Vector of family resources is represented by λi. Family resources are used because household resources play an important role regarding education decisions. For this reason, higher education level of household head, an indication of household earning possibilities and wealth are used as controls for family resources. Vectors of communal, individual and household characteristics are represented by δi μi and φi. εi is the stochastic error term. y* is a latent variable which is not observable. What is observable is that a child is either in school or not in school. The observation thus is y=1 if y*≥1 or else y=0.

The above specification is used in line with the dichotomous dependent variables. For the continuous dependent variables such as average years of schooling completed and household expenditure on education, the model used is;

$$\mathbf{S_i = \alpha_0 + \alpha_1 R_i + \alpha_2 \lambda_i + \alpha_3 \delta_i + \alpha_4 \mu_i + \alpha_5 \varphi_i + \varepsilon_i} \quad \textbf{4-3}$$

For all *i*=1, 2... n households. S_i stands for outcome variables such as total annual expenditure on education, years of schooling completed or number of children enrolled in school, which is dependent on communal, household head and household characteristics (δi μi and φi) such as distance to the nearest bank, post office and motorable road; child school enrolment, average age of school going children, whether a household receives remittances or not, household wealth, and household resources (λ). In line with other studies, a positive relationship is expected between household resources and school attendance (Edwards and Ureta 2003, Acosta 2006, Hanson and Woodruff 2003).

Family compositions are also likely to affect school attendance. A set of variables that are related to household and family composition are included in the model. These include household size and age groups of members within the household, household head characteristics such as education level, age, gender and marital status. A negative relation is expected between household size and school enrolment.

Additionally, location of household is likely to influence household decision to enrol children in school. For this reason, area of residence (rural or urban) and region (ten dummies) are also controlled for. It is expected that rural

households are less likely to be enrolled in school compared to urban households. This expectation is in line with empirical evidence (Calero et al. 2009). We also control for time since we use 3 sets of living standard surveys.

The instruments used in this paper for remittance is the interaction of the number of bank branches operating money transfer services in the region and origin of remittance, and total number of people sending remittances to a household. Both of these instruments explain why different households with similar characteristics would receive different amounts of remittance income. Remittances are thus determined by;

$$\mathbf{R_i} = \boldsymbol{\theta_1} + \boldsymbol{\theta_2}\boldsymbol{\lambda_i} + \boldsymbol{\theta_3}\boldsymbol{\delta_i} + \boldsymbol{\theta_4}\,\boldsymbol{\mu_i} + \boldsymbol{\theta_5}\boldsymbol{\varphi_i} + \boldsymbol{\theta_6}\boldsymbol{\Phi_i} + \boldsymbol{\vartheta_i} \qquad 4\text{-}4$$

Φ_i represents the instrumental variable to account for endogeneity. Equation 4.2 above is endogenous if there is a correlation between εi (in equation 4.2) and ϑi in equation 4-4. θ_is are the coefficient to be estimated. All other variables are same as those above in equation 4.2.

Outcome variables are school enrolment, total expenditure on education number of children enrolled in school and average years of schooling completed by children in school between 5 and 19. Because we have a dichotomous variable of school enrolment, the probit model is used and Tobit for the continuous variable of years of education and number of children enrolled in school. The user-written STATA programme conditional (recursive) mixed process estimator (cmp), written by Roodman (2009) is used.

To deal with the endogeneity and self-selection bias (that is, correlation between R and ε), an instrumental variable is used. This is done to allow for the error terms in the structural and reduced form equation to become correlated.

4.4 The Conditional (Recursive) Mixed Process Estimator

The model used in estimating the results includes censored, continuous and discrete dependent variables. As a result, the Conditional Mixed-Process (CMP) estimator is used. CMP is built on maximum likelihood. The CMP framework is chosen over the Amemiya (1978) Generalized Probit because CMP has the potential of estimating equations that have censored dependent variables in the same system.

CMP is a structural equation modelling which is used to maximize a conditional likelihood when the system to be estimated is made up of 2 different components; the first part for observations that are continuous and the second being conditional on the first one. It is therefore used to analyse the data because it takes into consideration models with both dummy and continuous dependent variables (Roodman 2009). Compared to OLS, CMP increases the efficiency of the system as the system takes into account the cross-equation covariances in the process of estimation. It is also important to state that the structural equation may give an idea of the impact of remittances on human capital. In some cases such as when the dependent variables is to be regressed on a binary and censored endogenous variables, just using a 2-stage least squares estimates may not lead to consistent results. CMP on the other hand, gives efficient and consistent estimates by permitting the user to indicate that one of the regressors is censored. The underlying principles of CMP can be

associated with maximum likelihood estimations and as such all the virtues of the ML can be associated with CMP.

4.5 Specifying and Identifying the Econometric Model

The instruments discussed above are used to acquire independent differences in the first stage equation that serve to help relate the second stage model of human capital. As pointed out earlier, the reason for using these instruments is that they help predict variations in remittances that a household receives. It is also assumed that the second stage human capital model are not in any way predicted by these instruments. The model to be estimated thus becomes a function of;

Remittances (Y = household receives remittances) = f [human capital (highest education level attained by household head, household head ever been in school), household characteristics (age of household head, age of household head squared, household size, religion and ethnicity of household head, average household age, number of members between the age 0-29), household wealth status (land ownership, ownership of dwelling, TV, radio, number of rooms in dwelling, connection to electricity grid, distance to nearest water source), communal characteristics (distance to nearest post office, motorable road and bank), instrumental variables, regional and area variables]

These variables are included with reference to the literature on migration which states that higher human capital factors are more likely to influence migration. That is, higher education leads to increased job and income prospects in destination areas (Adams 1993, 1991)[13]. Household characteristics such as the age of the households head, education level of household head and household size are also likely to affect migration and the receipt of remittances. In looking at remittances and poverty in rural Egypt, Adams (1991) proposed that migration tends to be a life cycle event in which households with more males over the age of 15, older heads and less under 5-year olds are more likely to partake. As stated earlier, sociological literature also stresses the importance of family and village networks in affecting migration, hence the inclusion of ethno-religious variables. The underlying identification assumption is that the instruments are not correlated with the unobservable components of second stage model conditional on the observable characteristics. In order to test the validity of the instrument, the DWH test is performed. The second stage human capital model can thus be estimated as;

Prob (Y = household has at least one child in school) = f [human capital (highest education level attained by household head, household head ever been in school), household characteristics (age of household head, age of household head squared, household size, religion and ethnicity of household head, average household age, number of members between the age 0-29), household wealth status (land ownership, ownership of dwelling, TV, radio, number of rooms in dwelling, connection to electricity grid, distance to nearest water source, communal characteristics (distance to nearest post office, motorable road and

[13] Earlier works found that there was a positive relationship between migration and education. However, Adams (1991, 1993) has found in his empirical work in Egypt that higher education does not lead an increase in self-selection into migration

bank), dummy of household remittance status, instrumental variables, regional and ethnic variables]

The rational for including the various variables are similar to those in the first stage model.

Chapter 5 Data and Descriptive Statistics

5.0 Introduction

The data used for the study is a repeated cross-section data drawn from three waves of living standard survey from the Ghana Statistical Service conducted between 1991/92 and 2005/2006 to estimate the extent to which remittances have helped develop the human capital capacity of Ghanaians. The choice of these three data sets is due to fact that compared to the first 2 waves; these waves have much more extensive information related to migration and remittances. Pooling the three waves also allows for the investigation of the effects of changes in the effect of remittances on human capital over time.

Household expenditure and income are not included in the model because of its endogeneity with outcome variables of interest. According to economic theory, household income directly impacts household spending on education since it is considered a normal. Household assets will therefore be treated as proxies for household socioeconomic characteristics. Household head characteristics including age, educational level, marital status and gender of household head, presence of spouse, household size, living state of affairs, that is, ownership of land, telephone, home and number of rooms in dwelling; type of roof and floor; access to in-house sanitation, distance to main source of water, and connection to electricity grid are used as proxies for household wealth. On the characteristics, the data set includes variables such as highest level of education of males and female household members, literacy status, school enrolment, number of children enrolled in school, proportion of household members in different age groups and average age of children in school.

5.1 Description of the GLSS Methodology

The Ghana Statistical Service designs the surveys to be nationally representative at the regional level. To meet this objective, samples of households were chosen to be nationally representative. A minimum of 400 households were chosen from both urban and rural areas in each of the ten administrative regions of Ghana. Additionally, the survey covered the three main ecological zones in the country. Like all other living standard surveys conducted in all countries, the surveys from Ghana includes information on education, consumption, migration, housing, nutrition, ethnicity, religion, access to education, household assets, banking services, access to water and electricity, condition of housing as well as expenditure on housing. The survey also includes information on remittances to households, intended purpose of said remittances, gender of the sender of these remittances and origin of remittances. Remittances are measured as the sum of all the monetary value of all cash and goods received by the household during the 12 months before the survey. The data however lacks detailed information on the characteristics of migrants. As a result, the study uses receipt of remittances as a proxy for household migrant status. Following Adams et al (2008), households which report having a migrant but do not receive remittances are considered non-remittances receiving households. This allows the study to focus on incomes from remittances rather than the presence or absence of a migrant in the household. This approach is

also used because the nature of the family system practiced in Ghana is so strong and that even those households that do not report having a migrant however receive remittances. Based on this, households are classified as either receiving remittances or not. Similar to Adams et al (2008), households that receive remittances but do not report having migrants are considered remittance-receiving households and those that report having migrants but do not report remittances are considered as non-remittance receiving households. Elca

5.2 Descriptive Statistics

Although a total of 15,239 households (79%) reported receiving remittances in one form or another, only 7,328 households (28%) actually reported income from remittances. For those that report a remittance only 23% reported receiving remittances weekly or monthly, 25.5 % quarterly or annually and there rest received remittances irregularly. Based on this, it is likely that these reported amounts for remittances are riddled with a lot of errors due to recall problems in terms of the accuracy of the amounts reported. Based on this, using the reported remittance income will lead to inaccurate coefficient estimates. As a result, the study measures remittances as whether or not a household receives remittances. In general, remittances make up between 2 and 17% of total income of remittance receiving households.

For remittances, data is collected on transfers received in the form of cash, food and non-food goods. Although most remittance receiving households receive remittances in the form of cash, including non-food and food element in the measurement is important because it leads to a more precise measure of remittances to Ghanaian households. Most remittances are made as part of the "extended family system" within which there is generally no economic obligation for repayment.

Table **1** below shows the distribution of remittances to households across the different areas and ecological zones. Households located in the capital, Accra, urban coastal and forest areas receive the greatest shares of remittances. The table also shows that rural coastal and forest areas receive more remittances compared to urban savannah areas. This is in line with the general poverty profile of Ghana[14]. The savannah areas which also happen to be the poorest zones, receive the least shares of remittances.

[14] Generally, as one moves from the coast to the northern part of the country, the level of poverty intensifies.

Table 1: Distribution of Remittances to Households by Location

Aggregate	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	Ghana
				GLSS 3				
Income from[15] Remittances	11.8	5.6	7.9	3.8	6.0	4.8	1.9	6.0
				GLSS 4				
Income from Remittances	11.8	19.6	21.9	7.1	9.6	6.0	3.5	10.4
				GLSS 5				
Income from Remittances	9.4	10.2	14.6	7.3	7.4	7.5	4.3	8.9

Source: Author's calculations from the Ghana Living Standards Survey 3, 4 and 5. Note: All figures are in percentages

Table 2 presents summary statistics for selected variables that compares households that receive domestic, foreign and those that do not receive remittances. The table shows that the probability of school enrolment is higher among households that receive foreign remittances. Children from foreign remittance receiving households are also likely to have 4 more years of education compared to domestic remittance households and 3.4 years more than non-remittances households. Boys from foreign remittance households have better educational outcomes compared to girls. This is an indication that Ghanaian households place higher premiums on educating boys. Another interesting trend from the table below is that households that do not report remittances seem to do better on all the variables compared to the domestic remittances households.

The proportions of children at the different levels of schooling tend to decrease with increases in levels of education. Foreign remittance households experience the highest proportions at each level, followed by domestic remittance households. Foreign remittance households also spend more on education. However, in comparison with domestic remittance households, non-remittance households spend more on education. When it comes to expenditure on girls' education, domestic remittance households tend to spend more in comparison with the other two categories. The table also shows that the probability of enrolling in public school is about the same for both domestic and foreign remittance receiving households while non-remittance households are more likely to send children to public schools. The table indicates that domestic remittance households tend to do worse on all the indicators of human capital used. Remittance recipient households are also composed of smaller family sizes compared to non-recipient households.

[15] Income from remittances are the total values of all goods, food and cash received in the past 12 months which then was recorded as the total income from remittances. The survey asks respondents whether or not remittances will be repaid. In cases where the respondents say they are to pay back the remittances, they usually are not sure what proportion they are to pay back. The survey treats all remittances as current transfers although a small proportion of it might be partly or full capital transfers.

Table 2: Selected Descriptive Statistics

	Source of Remittance								
	Domestic Remittances			Foreign Remittances			No Remittances[16]		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
School Enrolment	0.554	0.817	0.797	0.673	0.968	0.926	0.566	0.796	0.775
	(0.497)	(0.387)	(0.402)	(0.469)	(0.176)	(0.262)	(0.496)	(0.403)	(0.417)
Total Years of Education	3.272	5.564	5.334	7.281	12.984	12.339	3.925	6.401	6.374
	(6.863)	(8.460)	(8.433)	(10.207)	(11.556)	(10.910)	(7.780)	(9.269)	(9.414)
Public School Enrolment	0.526	0.542	0.538	0.531	0.547	0.543	0.593	0.610	0.602
	(0.028)	(0.029)	(0.027)	(0.043)	(0.043)	(0.041)	(0.103)	(0.104)	(0.099)
Number of Children In School	1.215	2.078	2.010	1.505	2.602	2.448	1.304	2.085	2.042
	(1.557)	(1.686)	(1.695)	(1.608)	(1.538)	(1.615)	(1.629)	(1.745)	(1.762)
Proportion of Income Spent on Education	0.252	0.346	0.375	0.347	0.690	0.576	0.285	0.408	0.384
	(2.378)	(2.580)	(3.132)	(2.293)	(3.524)	(3.291)	(3.796)	(4.655)	(4.589)
Proportion of Children in Primary School	0.133	0.194	0.190	0.121	0.226	0.215	0.129	0.185	0.180
	(0.199)	(0.188)	0.187)	(0.172)	(0.181)	(0.178)	(0.188)	(0.177)	(0.179)
Proportion of Children in Junior Secondary School	0.091	0.103	0.099	0.049	0.090	0.085	0.083	0.090	0.089
	(0.194)	(0.159)	(0.153)	(0.110)	(0.137)	(0.135)	(0.184)	(0.146)	(0.144)
Proportion of Children in Secondary School	0.025	0.021	0.020	0.029	0.042	0.052	0.022	0.024	0.023
	(0.115)	(0.072)	(0.076)	(0.089)	(0.093)	(0.118)	(0.098)	(0.075)	(0.073)

Source: Author's calculations from the Ghana Living Standards Survey 3, 4 and 5 Note: Tables displays means and standard deviations (parenthesis)

[16] Some of the households that fall into this category do not report a remittance source.

On the other hand, Table A *1* in Appendix A shows summary statistics of the control variables used in the analysis. Generally, the table shows differences between domestic, foreign and non-remittance recipient households. In general, school age children from recipient households are older than children from non-recipient households. Children from foreign recipient households are older than those from domestic recipient households. On average, school age children in foreign recipient households are 0.84 of a year older than those from domestic recipient households and 0.97 of a year older than those from non-remittance receiving households. Comparing boys to girls, the data shows that they are older than the girls. Foreign remittances households are on average older than those from the other types of households. The numbers of remitters to both domestic and foreign households are averagely about the same at 1.4 for both. Household heads of non-remittances households are more likely to be male and less likely in remittance households. This is in line with studies that have found that men are comparatively more likely to migrate than women (Morrison et al. 2008). Non-remittance household heads are also more likely to be married and have their spouses present compared to remittance recipient households.

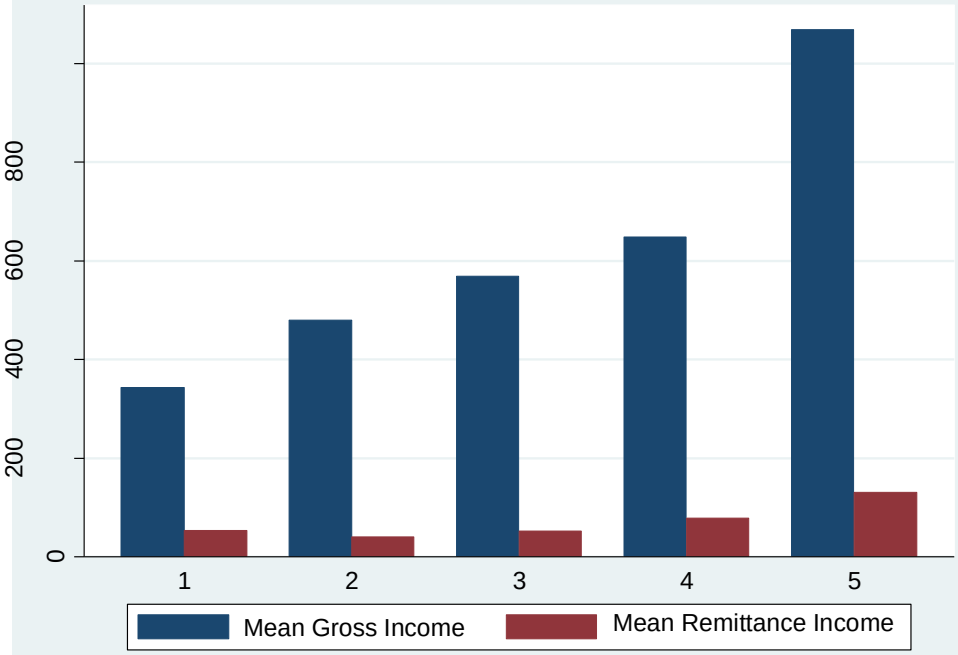
The data also shows that male adult members from domestic, foreign and non-remittance households have higher levels of education (0.64, 0.32 and 1.5 years) compared to their female counterparts. The education level of female adults does not show that much variation between domestic recipients and non-recipient households. Foreign remittance households however tend to display much more variations. Households that receive remittances have better educated adults. On average, female adults from foreign remittances households have 3.2 years more years of education than those from domestic and non-remittances households. Male adults from foreign remittances households have 2.9 and 2 more years of education than those from domestic and non-remittances households.

Additionally, recipient households have better access to certain assets such as cement floors, higher number of rooms in dwelling, in-house sanitation, live closer to motorable roads, banks, post offices, fridge, telephones, and are connection to electricity grid. Whereas foreign recipient households are more likely to own televisions and radios, domestic recipients are more likely to own land and non-recipients are more likely to be home owner.

There are also regional variations in location of households between recipient and non-recipient households. Domestic remittance-recipient households are more likely reside in Eastern, Central, Volta, Ashanti and Greater Accra Regions whiles foreign remittance recipients are most likely to reside in Greater Accra and Ashanti Regions and less likely to live in rural areas. The concentration of foreign remittances in these two regions, (which also happen to be the 2 better of regions) is an indication of the concentration of MTOs and modern bank services operating money transfers in those regions.

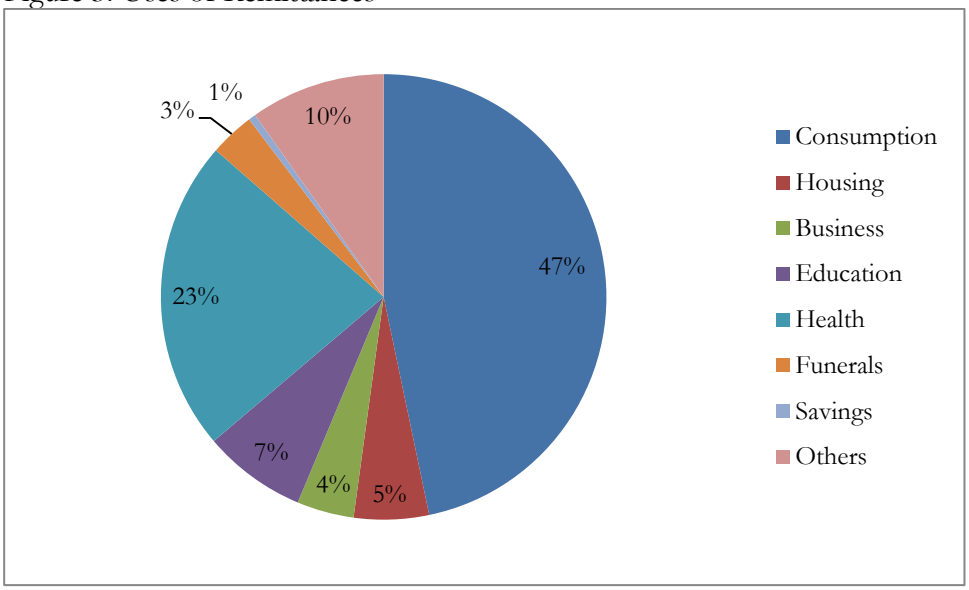
When it comes to distribution of remittances among the five national income quintiles, the richest income group (Quintile 5) receives the largest remittances. The average amount that households in this income group receive is GH¢130.903 (or ¢1,309,030-old cedis) about three times the amount received by the group with the least flow (Quintile 2). This characteristic is in line with studies that have found that remittances tend to worsen inequality in the short run (Fajnzylber and López 2007, Koechlin and Leon 2007).

Figure 2: Gross Remittance and Annual Income by Income Quintiles



Source: Author's computation from GLSS3-5 Data

Figure 3: Uses of Remittances



Source: Author's computation from GLSS3-5 Data

The data also indicates that majority of households spend remittances on consumption. Whereas 47 per cent of households reported spending remittances on consumption, only 7 per cent reported spending remittances on education.

Chapter 6 Results

6.0 Introduction

As noted earlier, the problem associated with remittance research is the endogeneity associated with remittances and human capital variables. To overcome the endogeneity problem, the instrumental variable approach is adopted for this paper.

The results from the analysis are presented in this section. Table A2-Table A5 presents results of the various estimations carried out. For school enrolment, children between the ages of 5 and 19 are considered. This age group is looked at because we only want to look at the impact of remittances on basic and secondary school education. Table A2 presents results of the probability of a household having at least one child in school. As stated earlier, remittances are measured as a binary variable of whether a household receives remittances or not. The dependent variables used include whether a household had at least one child in school or not, average years of education completed by children currently in school, number of children enrolled in school and total expenditure on education.

Apart from remittances, other control variables used include household head characteristics such as gender, age and marital status of household head, household composition, and average age of school going children, proportion of females in the household, area and regional locations. Household income and expenditures are not included the model as independent variables because they have the potential of affecting the outcome variables. Household spending is likely to directly affect school enrolment decisions. Instead, the socio-economic status of households is proxied by ownership of durable assets such as house, TV, radio and lands. Other proxies used include number of rooms in the house, type of fuel used in cooking and lighting (dummies of 1 for gas or electricity and 0 for all others).

The test for the exogeneity of the instruments used is carried out using the estimate of the transformed ϱ (athanrho) which is one of the outputs of the CMP estimation method. Each table displays estimates of the transformed ϱ in the bottom row. The transformed ϱ estimate gives the correlation between the error terms in the human capital and the remittance model. The null hypothesis for this test states that the correlation between the equations is zero. A rejection of the null hypothesis indicates that the remittance equation is exogenous to the error term in the human capital model and hence the use models that assume the exogeneity of remittances leads to more efficient estimates. In this case, there will be no need to us instrumental variable approach. The value of transformed ϱ gives the extent to which the first stage estimation over estimates the results. Each table of results displays the transformed ϱ associated with that estimate. In cases where there is no evidence of endogeneity, that is, in cases where transformed ϱ is insignificant statistically, the interpretation of the probit/Tobit model in the first stage is used. As stated earlier, DWH test for the need to instrument and the Sargan-Hansen test to check the validity of the instruments was performed. The results of transformed ϱ confirmed the results of the DWH and the Sargan-Hansen tests.

In addition, the F-statistics of the combination of excluded instruments and the Sargan test (Wald test of exogeneity for the probit mode) of over-identification are carried out and displayed in Panel B of each table. The results indicate that the instruments used are valid and not weak. Overall, the results show the same net-effect on receiving remittances for all the models. In all specifications, the F-tests of the instrument are significant. The number of remitters to a household has a significant and positive effect on receiving remittances, implying an increase in the number of remitters would lead to an increase in the probability of receiving remittances by 14.5 percentage points. The bank branch-origin of remittance interaction variable also has a positive and significant relationship on the probability of receiving remittances. The coefficients of the instruments are lower in the instrumental variable regressions than they are in the linear reduced form models[17]. This is an indication that not using IVs lead overestimation of results.

6.1 Effect of Remittances on School Enrolment

Table A2 displays the results of the effects of receiving remittances on the probability of a household having at least one child enrolled in school. Since the outcome variable (school enrolment) and receiving remittances are both binary, it is necessary to use a probit model. Due to the endogenous nature of remittances, we implement use the user-written command, cmp to implement 'ivprobit'.

The results instruments whether or not households receive remittances. The table shows that remittances have a positive effect on the probability that a household will have at least one child enrolled in school, with the effect being greatest for rural households. Although urban households experience the least effect of receiving remittances, the effect is not significant. The results from the table support the general idea that remittances tend to increase household income thereby increasing the chances of parents investing in the education of their children. The table presents results for the whole sample, for boys and girls between 5 and 19, as well as for rural, urban areas, primary, junior and senior secondary school levels in columns 1,2,3,4, 5 and 8 respectively. The results indicate that on average, children from households that receive remittances are 10.2 percentage points more likely to be in school. When we take households with boys between the ages of 5 and 19, receiving remittances increases the probability of a household having at least one boy between these ages enrolled in school by 6.3 percentage points. The probability is higher for household with girls between the same ages. For households with girls, the probability increases by 8.9 percentage points. Rural households experience the highest (13.5) percentage points increase in education as a result of receiving remittances. Looking at levels of education in columns 6-8, households with children enrolled in primary school in primary school experience the biggest effect of remittances. Receiving remittances leads to a 10.3 percentage point increase in the probability that a child will be sent to primary school.

[17] Results not shown

Household characteristics such as average household age and household size as well as household head characteristics also affect school enrolment. Children from male headed households are less likely to be enrolled in school compared to female headed households. Of all the four sub-samples, the biggest effect of male headed households on school enrolment is experienced in rural areas. Male headed households in rural area are 7 percentage points less likely to have at least one child in school compared to their female headed counterparts. Girls from male headed households are 2 percentage points more likely to be in school compared to boys from the male headed households. There is however no significant effect of male household heads on the different levels of education.

The results also indicate that household head educational status are positively related to school enrolment. The education level of the household head is an indication of a number of factors such as efficient taste for schooling, genetic abilities and parental role model and motivation; hence the higher education a household head has, the higher the probability that children from that household will go to school. Household heads that have ever been to school are more likely to also send children to school, with the greatest effect experienced in rural areas. The effect of household head ever being in school has no impact on urban households, that is, the coefficient of whether or not a household head has ever been to school is not significant. Compared to the highest level of education, whether or not a household head has been to school tends to have a greater effect on school enrolment probabilities. While the effect of the dummy of household head ever being in school ranges from 2.7 percentage points for boys to 4.0 percentage points for rural areas and 4.8 percentage points for junior and senior secondary levels of education. The effect of highest level of education of household head on the probability of having at least one child enrolled in school ranges from 0.07 for girls, primary and junior secondary households to 0.08 percentage points for urban households.

The results also show a positive effect of household size on school enrolment with households that have children enrolled in secondary school experiencing the highest effect of 3.4 percentage points. A one standard deviation in average household size leads to leads to a 9.48 (2.789 *0.034*100) percentage increase in secondary school enrolment. Average age of children in school on the other hand has a positive effect on school enrolment, with rural households and those with secondary school age children experiencing the highest effects. The proportion of members in the 0-4 and 20-29 age groups tend to have a negative effect on the probability of school enrolment. This is due to the fact that members in these age groups are either too young or too old to be in school, an increase in the proportion of members in these age groups leads to a reduction in the probability of households having at least one child in school, hence the negative relationship. For children between the ages of 5 and 9, it appears there is no gender discrimination in school enrolment[18]. Looking at the levels of education, the effects of receiving remittance on school enrolment, households with more members in the 5-9, 10-14 and 15-19 age groups experience the higher effects of primary, junior and senior secondary school enrolment respectively.

[18]This finding is in line with Ponce and Vos (2004)

On average, the marital status of the head of household increases the probability of school enrolment for the whole sample, rural, urban households with boys. The results also indicate that the presence of the spouse of household head also has a significant impact on school enrolment for the whole and rural households. Whiles households that have heads who belong to the Gur and other ethnic groups are less likely to enrol children in school, (coefficients are negative and significant) Ga, Ewe and Guan ethnic headed households are more likely to enrol children in school (positive but insignificant except urban areas-negative but insignificant coefficient) compared to Ashanti headed household.

Children from rural areas are less likely to be enrolled in school compared to their urban counterparts. Whereas children from Greater Accra, Western, Eastern, Volta, Central, Ashanti, and Brong Ahafo Regions[19] are more likely to be enrolled in school, those from the Northern and Upper East Regions are less likely to be enrolled in school in comparison to their Upper West counterpart. Although marginal, the distance to source of drinking water has a negative relationship with school enrolment as more time is spent on getting water to the detriment of school attendance (0.03 percentage point decrease with a every 1 kilometre increase in distance).

The results further indicate that household wealth proxied by such resources as cement floors ownership of fridge, radio and access to in-house sanitation are positively related to school enrolment.

6.2 Effect of Remittances on Years of Education

A number of literature such as Basu (1999) Bell and Gersbach (2001) proposed that the higher the number years of education a person receives, the higher their human capital potentials. However, the amount of human capital a person receives is not only embodied in the number of years of education received but also the quality of education and the amount of money spent on education. It is therefore reasonable to assume that there is a positive relationship between human capital, years of schooling and the quality of education. In line with the above assertion, Table A3 and Table A4 below shows the effect of remittances on the average years of education completed and the number of enrolled in school.

For these two analyses, we use a Tobit model via the cmp command. For many households, the average years of schooling completed and the number of children in school is zero either due to the fact that there were no children currently enrolled in school or there were no children between this age group hence using any other method such as OLS, will lead to inconsistent estimates. Tobit is also used because it allows for the inclusion of households that have zero year of education or no children in this age group that are enrolled in

[19] These 7 regions are relatively better off compared to the last three. Poverty levels here are much in the these three northern regions

school. Using OLS based on censoring[20] of the sample with these two limited dependent variables will result in inconsistencies of the results

Except for urban households, the results indicate a positive and significant relationship between receiving remittances and number of years of schooling children are likely to complete. That is, children from remittances receiving households on average complete more years of schooling compared to their cohorts from non-receiving households. The greatest effect of receiving remittances is greatest for households with children in senior secondary school. Not surprisingly, the effect is greater for boys than it is for girls. This is in line with the patriarchal system practiced in Ghana where parents place a higher premium on educating boys than for girls. Boys and girls from remittance receiving households on average have 3.1 and 1.9 percentage points more years of education respectively. Comparing households based on there are of location, rural households experience a higher effect on years of education as a results of receiving remittances. Children from the households that receive remittances have 2.3 percentage points more years of education.

The age of household head has a positive effect on education, implying that older household heads tend to keep children in school longer compared to younger ones. Households with boys, girls and children enrolled in primary school experience are kept longest in school as a results of having older head a one standard deviation in the average age of household heads leads a 4.65 (15.487*0.003*100) percentage points increase in the years of education completed by boys, girls and primary school children. The number of years of education completed by household head and educational status of head measured by whether or not the head has ever been to school is also important in determining the number of years of schooling children complete. A household head who has ever been in school will allow children to complete 7.1 percentage points more years of schooling for urban households and 18.1 percentage points for rural households. This is because people who have been to school tend to value education more compared to their illiterate counterparts. Highest level of education of household has the greatest impact on urban household. A one year standard deviation increase in the education level of urban household head results in an increase of 2.2 (2.153*0.010*100) percentage points increase in the average number of years of schooling children complete and 1.2 (2.153*0.006*100) percentage points for rural households. Although the effect of the gender of household head on years of schooling completed, male headed households also tend to keep children in school longer compared to their female counterparts, except for urban households. The marital status of household head leads to children receiving more education. Apart from the subsample on the three levels of education, children from households headed by non-Christian are likely to have less years of schooling

The average household age leads to a negative effect on years of education. Although the average age of children in school has mixed effects on years of education completed, the square of average age of children in school has a positive effect, implying an increasing return in terms of age of children cur-

[20] Censoring in statistical literature refers to a sample in which some of the observations are recorded as either below or above a certain limit. See Maddala (1983) for a detailed discussion.

rently in school and average years of schooling received. The non-linear relation makes sense because on average, one would expect that older children receive more education and as they stay in school longer, they also complete more years of schooling. Whereas there is a negative relationship between the proportion of children under 9 years and years of education, the presence of household members between the ages of 10 and 29 tends to increase the average years education across all the 8 regressions. The more members a household has, the more years of education children end up receiving.

Household wealth proxied by household assets such as TV and fridge have positive effects on years of education. Distances of households to the nearest post office, bank and motorable road have negative effects on years of education.

6.3 Effects of Remittances on Number of Children Enrolled In School

Table A4 displays the results for the effect of remittances on the number of children that are enrolled in school. Similar to the previous estimate on years of schooling completed, we implement Tobit via the user written command, cmp because a lot of households did not have children in school. Except for the subsample of girls, receiving remittances on average leads to an increase on the number of children households enrol in school across all columns other panels. On average, households that receive remittances increase the number of children in school by 4.4 percentage points. Rural households in comparison to urban ones, experience a higher effect of remittances on the number of children that are sent to school as a result of receiving remittances. This finding is in line with the assertion that remittances lead to household credits and resources being relaxed and hence parents are able to invest more in the number of children they send to school. In comparing levels of education, receiving remittances also leads to more children being sent to secondary school compared to households with children in junior secondary and primary school.

Age of household head has a positive effect on the number of children that are sent to school. On average, a one year increase in the age of the household head leads to a 0.2 percentage points increase in the number of children enrolled in school. In other words, a one standard deviation increase in the age of household head leads to a 3.1 (15.49*0.002*100) percentage points increase in the mean number of children enrolled in school. The effects of household head age increase to 0.05 percentage points for households with children in secondary school. Similar to previous estimations on the probability of school enrolment and years of schooling completed by children, the household head educational status increases the number of children in school. Male headed households have fewer children in school compared to female headed households. Average household age is negatively and significantly related to the number of children enrolled in school. Apart from the estimation on the level of education, number of children in school is negatively related to the proportion of household members in the 0-4 and 20-29 and positively related to the 5-19 years age groups. A one standard deviation in the proportion of members in the 0-4 and 20-29 age group leads to 3.8 (0.246*0.155*100) and 1.6 (0.059*0.279*100) percentage points decrease in the mean number of children enrolled in school whiles a 1 standard deviation in the proportion of members in the 5-9, 10-14 and 15-19 age groups leads to the mean number of children in school increasing by 6.0 (0.150*0.403*100), 6.5 (0.146*0.448*100) and 3.7 (0.146*0.251*100) percentage points respectively.

As expected and similar to earlier results, households assets such as having cement floors, fridge, phone and access to indoor sanitation have a positive and significant relationship with the number of children households send to school. Although insignificant, households located in rural areas have fewer children in school compared to urban households.

6.4 Effects of Remittances on Education Expenditure

As a final step in the analysis, the effect of receiving remittances on expenditure on education is carried out and presented in *Table A5* in Appendix B. Consistent with earlier results, the results from this table indicate that remittances have a positive impact on annual household expenditure on education. The table indicates that receiving remittances leads to a 61 percentage points (61 pesewas for every ¢1 spent[21]) increase in household expenditure on education. The increase in expenditure on education as a results of receiving remittances is biggest for girls. As a result of receiving remittances, households spend 74.5 percentage points more on education girls compared to 60 for boys. Based on household location, the effect of receiving remittances leads to education expenditure increasing by 73 and 60 percentage points for urban and rural households respectively. Households with children enrolled in primary school have the increase in educational expenditures as a results of receiving remittances, while households with children in secondary school experience the least effect. Receiving remittances leads to a 60.8 and 30.2 percentage points increase in expenditure on education for primary and secondary school enrolment respectively.

Although male headed households spend more on education, the effect is not significant except for urban households. The results also indicate that older household heads spend more on education for the full sample, girls, urban households and all three levels of education. A one standard deviation increase in the age of household head for these samples lead to a 34.1 (15.487 *100*0.022), 31.1 (15.487 *100*0.020), 77.4 (15.487 *100*0.05) 35.6 (15.487 *100*0.023), 65 (15.487 *100*0.042) 71.2 (15.487 *100*0.046) percentage points increase in average annual expenditure on education. Highly educated household heads spend more on secondary school education. Generally, the educational status of household head leads to a significant and positive effect on education expenditure. This is because more educated household heads are more likely to place a higher value on education than their uneducated counterparts, hence also spend more on educating children. Whiles Muslim headed households spend more on annual education expenditure, households headed by traditionalists spend less compared to their Christian counterparts. Consistent with earlier results, there is a negative relationship between the proportion of members in the 0-4 and 20-29 age groups and positive relationship between the proportion in the 5-19 age groups and expenditure on education. While the proportion of household in the 5-9 age group experience the highest primary school expenditure, 10-14 year olds experience the highest effect for junior secondary school and 15-19 year old for senior secondary school.

Average age of children in school has a positive and significant effect on education expenditure. However, the effect are only significant for the full sample, girls, rural households, primary and secondary subsamples. Household size also has a significant and positive relationship on annual household expenditure on education. A one standard deviation increase in household size leads to an increase of 22.9 (2.789*0.082*100), 17.9 (2.789*0.064*100), 20.1 (2.789*0.072*100), 19.2 (2.789*0.069*100), 34.5 (2.789*0.124*100) 22.3

[21] 100 pesewas is equal to GH¢ 1

(2.789*0.080*100), 27.3(2.789*0.098*100) 27.9(2.789*0.100*100) percentage points in average household expenditure on education for columns 1,2,3,4, 5, 6, 7 and 8 respectively.

As expected, household assets have a positive and significant influence in household annual education expenditure. Also, households in income quintiles 2-5 spend more on education annually compared to those in the lowest quintile, with households in upper quintiles spending more. This is an indication that education decisions are influenced by family budget constraints.

Chapter 7 Conclusion

In spite of the fact that the size of remittances to Ghanaian households have been increasing over the past 25 years, very little empirical work has been carried out to analyse the impact it has on children schooling and human capital in general. Most studies that have been carried out on remittances in Ghana have looked at its impact on poverty and inequality. This is mainly due to the fact that Ghana does not have a comprehensive data on migration flows hence the lack of research on remittances and its impact on human capital. Also, available data on remittances do not include an enormous or unspecified sum of remittances that do not go through unofficial and informal channels. This paper therefore attempted to fill that gap by using the user written command cmp, by Roodman (2009) to analyse the impact of remittances on human capital development in Ghana.

In theory, remittances have been known to contribute to and supplement family incomes, which in turn leads to relaxing family budget constraints. By relaxing family budget constraints, remittances then have the possibility of leading to households investing in education, thereby increasing the human capital potentials of children in the household. Since issues that has to do with migration and hence remittances are not decided on in isolation, remittances are considered to be endogenous empirically. In order to solve the issues of endogeneity, instrumental variables were used. Two instruments, the total number of remitters to each household and an interaction between the origin of remittances and the number of regional bank branches operating money transfer services. Both of these instruments reflect variations in the amount and frequency with which households would receive remittances. The bank branch-origin interaction also captures differences in cost of receiving remittances, labour market outcomes and the ease of finding a job at the destination, hence explains why two households with similar characteristics will receive different amounts.

After instrumenting for remittances, the results indicate that receiving remittances have the potential of increasing human capital. These monetary flows also relax the credit constraints that households face and results in more investment in the education of children, especially for rural households. The results also indicate that when endogeneity of remittances is not taken into account, the effects of remittances will be overestimated. This implies that increasing the flow of remittances to Ghanaian households will lean increase in the educational attainment of children between 5 and 19 years. The results also indicate that across time, human capital indicators have improved.

Given the fact that the results indicate that rural households experience some of the greatest effects of receiving remittances has important policy implications. Since the bank branch interaction term indicates that the more bank branches there are in a community the higher the probability of receiving remittances, it is important to put in place measures that will reduce the cost of receiving remittances associated with rural households. Policies that will enable a reduction in transactions costs associated with sending and receiving remittances, especially international remittances, such as transactions costs and bank charges will increase the flow of remittances, thereby enhancing the human

capital stock of households. As female headed households are more likely to send children to school and also send more children to school compared to their male counterparts, it is important to encourage Ghanaian migrants to send more remittances to female headed households in order in build-up human capital which in the long run will lead to a reduction in poverty and increase the long term developmental objectives of Ghana.

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Appendix

Appendix A: Descriptive Statistics

Table A 1: Sample Descriptive Statistics

	Domestic Remittances			Foreign Remittances			No Remittance		
	Full	**Boys**	**Girls**	**Full**	**Boys**	**Girls**	**Full**	**Boys**	**Girls**
Variable	**Mean** **SD**	**Mean** **SD**	**Mean** **SD**	**Mean** **SD**	**Mean** **SD**	**Mean** **SD**	**Mean** **SD**	**Mean** **SD**	**Mean** **SD**
Household Characteristics									
Number of Remitters	1.378 (0.679)	1.355 (0.659)	1.364 (0.668)	1.363 (0.650)	1.324 (0.604)	1.406 (0.681)	-	-	-
Average Household Age	30.788 (18.121)	23.775 (9.551)	23.595 (9.627)	32.658 (18.640)	24.499 (9.634)	25.491 (10.222)	26.659 (13.161)	22.492 (8.386)	22.351 (7.850)
Average School Age	2.901 (5.405)	4.400 (5.841)	4.265 (5.770)	3.736 (6.399)	6.075 (6.416)	5.336 (6.285)	2.762 (5.248)	4.215 (5.753)	4.051 (5.689)
Sex of Household Head (1=Male)	0.543 (0.498)	0.567 (0.496)	0.527 (0.499)	0.606 (0.489)	0.600 (0.491)	0.572 (0.496)	0.782 (0.413)	0.793 (0.405)	0.774 (0.418)
Household Head Age	48.077 (17.500)	49.041 (14.532)	48.709 (15.031)	47.350 (16.419)	48.424 (13.463)	49.480 (14.970)	43.539 (13.904)	46.015 (12.284)	45.853 (12.415)
Marital Status of Head	0.608 (0.488)	0.726 (0.446)	0.710 (0.454)	0.591 (0.492)	0.712 (0.454)	0.686 (0.465)	0.731 (0.444)	0.824 (0.381)	0.826 (0.379)
Spouse of Head Present	0.250 (0.433)	0.328 (0.470)	0.305 (0.460)	0.389 (0.488)	0.520 (0.501)	0.509 (0.501)	0.430 (0.495)	0.518 (0.500)	0.516 (0.500)
Head Ever Been To School	0.588	0.562	0.563	0.833	0.860	0.823	0.657	0.614	0.617

	(0.492)	(0.496)	(0.496)	(0.374)	(0.348)	(0.382)	(0.475)	(0.487)	(0.486)
Highest Level of Education Completed by Head	2.141 (2.139)	2.079 (2.184)	2.122 (2.201)	3.506 (1.970)	3.508 (1.988)	3.472 (1.975)	2.474 (2.145)	2.400 (2.229)	2.415 (2.231)
Highest Male Education Level	7.299 (4.773)	6.569 (4.645)	6.977 (4.696)	10.182 (4.564)	9.160 (4.981)	9.920 (4.595)	8.189 (4.807)	7.652 (4.836)	7.993 (4.877)
Highest Female Education Level	6.664 (4.809)	6.525 (4.704)	6.641 (4.564)	9.896 (4.030)	9.518 (4.216)	9.440 (4.000)	6.683 (4.883)	6.415 (4.816)	6.612 (4.773)
Number of 0-4 age group	0.542 (0.796)	0.676 (0.847)	0.699 (0.858)	0.338 (0.615)	0.444 (0.705)	0.469 (0.682)	0.640 (0.837)	0.763 (0.888)	0.780 (0.893)
Number of 5-9 age group	0.634 (0.876)	1.088 (0.965)	1.067 (0.957)	0.445 (0.730)	0.900 (0.837)	0.786 (0.851)	0.695 (0.911)	1.141 (0.981)	1.123 (0.983)
Number of 10-14 age group	0.587 (0.842)	1.040 (0.936)	1.021 (0.927)	0.501 (0.811)	0.976 (0.969)	0.952 (0.955)	0.621 (0.870)	1.054 (0.954)	1.037 (0.954)
Number of 15-19 age group	0.452 (0.749)	0.789 (0.881)	0.767 (0.870)	0.463 (0.743)	0.844 (0.862)	0.871 (0.853)	0.488 (0.787)	0.814 (0.910)	0.817 (0.903)
Number of 20-29 age group	0.565 (0.785)	0.567 (0.840)	0.557 (0.819)	0.596 (0.806)	0.628 (0.837)	0.683 (0.883)	0.661 (0.839)	0.623 (0.875)	0.637 (0.877)
Household Size	4.108 (2.701)	5.800 (2.529)	5.704 (2.545)	3.652 (2.387)	5.336 (2.141)	5.325 (2.060)	4.543 (2.840)	6.177 (2.650)	6.150 (2.656)
Household Assets									
Ownership of TV	0.170 (0.376)	0.181 (0.385)	0.188 (0.390)	0.603 (0.490)	0.596 (0.492)	0.653 (0.477)	0.237 (0.425)	0.231 (0.422)	0.236 (0.425)
Ownership of Radio	0.521 (0.500)	0.557 (0.497)	0.550 (0.498)	0.833 (0.374)	0.832 (0.375)	0.827 (0.379)	0.630 (0.483)	0.636 (0.481)	0.639 (0.480)
Ownership of Dwelling Place	0.429 (0.495)	0.494 (0.500)	0.482 (0.500)	0.333 (0.472)	0.400 (0.491)	0.391 (0.489)	0.440 (0.496)	0.524 (0.499)	0.511 (0.500)
Number of Rooms in Dwelling	1.757 (1.166)	2.101 (1.368)	2.052 (1.320)	1.959 (1.369)	2.304 (1.498)	2.369 (1.531)	1.872 (1.286)	2.213 (1.472)	2.202 (1.441)

Floor (1=Cement)	0.836	0.823	0.835	0.936	0.940	0.926	0.825	0.814	0.821
	(0.370)	(0.382)	(0.371)	(0.245)	(0.238)	(0.262)	(0.380)	(0.389)	(0.384)
Ownership of Fridge	0.121	0.133	0.145	0.507	0.540	0.542	0.159	0.153	0.167
	(0.326)	(0.339)	(0.352)	(0.500)	(0.499)	(0.499)	(0.366)	(0.360)	(0.373)
Telephone	0.100	0.077	0.079	0.764	0.768	0.838	0.158	0.126	0.140
	(0.339)	(0.291)	(0.299)	(0.712)	(0.751)	(0.712)	(0.427)	(0.381)	(0.404)
Distance to Water Source	1.588	1.518	1.981	2.141	2.488	1.561	1.316	1.295	1.512
	(19.923)	(18.393)	(21.737)	(21.436)	(19.908)	(14.854)	(19.458)	(20.303)	(21.266)
Connection to Electricity Grid	0.409	0.391	0.399	0.757	0.748	0.756	0.417	0.380	0.392
	(0.636)	(0.674)	(0.634)	(0.433)	(0.435)	(0.430)	(0.618)	(0.609)	(0.621)
Distance to Nearest Post Office	9.009	10.512	10.290	2.842	3.013	2.651	9.634	10.451	10.256
	(38.501)	(44.829)	(43.144)	(10.434)	(11.084)	(10.779)	(33.840)	(33.400)	(33.378)
Distance to Nearest Post Bank	10.172	11.847	11.543	2.195	2.483	1.906	10.712	11.536	11.477
	(39.609)	(45.781)	(44.530)	(8.747)	(9.607)	(8.806)	(36.338)	(35.661)	(36.395)
Distance to Nearest Motorable Road	0.569	0.591	0.625	0.275	0.448	0.236	0.767	0.844	0.865
	(2.551)	(2.342)	(2.740)	(2.722)	(3.972)	(2.799)	(4.752)	(5.727)	(5.771)
In-house Sanitary Service	0.766	0.733	0.744	0.920	0.904	0.897	0.745	0.714	0.723
	(0.424)	(0.442)	(0.436)	(0.272)	(0.295)	(0.305)	(0.436)	(0.452)	(0.447)
Ownership of Land	0.655	0.754	0.727	0.363	0.416	0.373	0.649	0.720	0.708
	(0.475)	(0.431)	(0.446)	(0.481)	(0.494)	(0.484)	(0.477)	(0.449)	(0.455)
National Income Quintile 1	0.160	0.232	0.217	0.044	0.064	0.077	0.163	0.238	0.220
	(0.367)	(0.422)	(0.412)	(0.206)	(0.245)	(0.268)	(0.369)	(0.426)	(0.414)
National Income Quintile 2	0.162	0.213	0.203	0.072	0.128	0.118	0.162	0.213	0.214
	(0.368)	(0.410)	(0.403)	(0.259)	(0.335)	(0.323)	(0.368)	(0.409)	(0.410)
National Income Quintile 3	0.179	0.215	0.216	0.143	0.204	0.210	0.173	0.201	0.205
	(0.383)	(0.411)	(0.412)	(0.350)	(0.404)	(0.408)	(0.378)	(0.401)	(0.404)
National Income Quintile 4	0.199	0.185	0.189	0.197	0.220	0.236	0.206	0.196	0.205
	(0.399)	(0.388)	(0.392)	(0.398)	(0.415)	(0.426)	(0.404)	(0.397)	(0.404)
National Income Quintile 5	0.300	0.155	0.174	0.544	0.384	0.358	0.297	0.152	0.156

	(0.458)	(0.362)	(0.379)	(0.499)	(0.487)	(0.480)	(0.457)	(0.359)	(0.363)
Regional Controls									
Residing in Western Region==1	0.089	0.081	0.089	0.076	0.108	0.085	0.110	0.109	0.107
	(0.285)	(0.273)	(0.285)	(0.264)	(0.311)	(0.279)	(0.313)	(0.312)	(0.309)
Residing in Central Region==1	0.114	0.112	0.105	0.085	0.088	0.089	0.091	0.082	0.087
	(0.318)	(0.316)	(0.307)	(0.280)	(0.284)	(0.285)	(0.288)	(0.274)	(0.282)
Residing G. Accra Region==1	0.113	0.087	0.092	0.230	0.208	0.258	0.155	0.126	0.131
	(0.317)	(0.282)	(0.290)	(0.421)	(0.407)	(0.439)	(0.362)	(0.332)	(0.338)
Residing in Volta Region==1	0.123	0.127	0.121	0.061	0.052	0.077	0.097	0.102	0.102
	(0.329)	(0.333)	(0.326)	(0.239)	(0.222)	(0.268)	(0.296)	(0.302)	(0.302)
Residing in Eastern Region==1	0.124	0.124	0.123	0.080	0.080	0.044	0.106	0.106	0.106
	(0.330)	(0.330)	(0.329)	(0.272)	(0.272)	(0.206)	(0.308)	(0.308)	(0.308)
Residing in Ashanti Region==1	0.189	0.187	0.197	0.338	0.316	0.317	0.159	0.158	0.155
	(0.391)	(0.390)	(0.398)	(0.474)	(0.466)	(0.466)	(0.366)	(0.365)	(0.362)
Residing in Brong Ahafo Region==1	0.096	0.100	0.095	0.095	0.104	0.096	0.091	0.092	0.094
	(0.295)	(0.300)	(0.293)	(0.294)	(0.306)	(0.295)	(0.288)	(0.289)	(0.292)
Residing in N. Region==1	0.059	0.063	0.067	0.020	0.024	0.022	0.091	0.106	0.101
	(0.235)	(0.242)	(0.250)	(0.139)	(0.153)	(0.147)	(0.288)	(0.308)	(0.302)
Residing in Upper East Region==1	0.032	0.040	0.036	0.008	0.008	0.007	0.051	0.062	0.059
	(0.177)	(0.197)	(0.186)	(0.090)	(0.089)	(0.086)	(0.220)	(0.240)	(0.236)
Residing in Upper East Region==1	0.060	0.079	0.074	0.007	0.012	0.004	0.047	0.057	0.057
	(0.237)	(0.269)	(0.262)	(0.081)	(0.109)	(0.061)	(0.211)	(0.232)	(0.233)
Rural==1	0.643	0.683	0.671	0.289	0.340	0.269	0.619	0.669	0.653
	(0.479)	(0.465)	(0.470)	(0.454)	(0.475)	(0.444)	(0.486)	(0.471)	(0.476)

Appendix B: Tables from Analysis

Table A2: Effect of Receiving Remittances on the Probability of Having a Child in Enrolled School

	1	2	3	4	5	6	7	8
	All		Gender		Area		Level of Education	
	Full Model	Boys	Girls	Rural	Urban			
	Marginal Effect (SE)	**Marginal Effect (SE)**	**Marginal Effect (S E)**	**Marginal Effect (SE)**	**Marginal Effects (SE)**	**Marginal Effect (SE)**	**Marginal Effect (SE)**	**Marginal Effect (SE)**
Receive Remittances	0.102***	0.063**	0.089***	0.135***	0.050	0.103***	0.100***	0.080***
	(0.023)	(0.028)	(0.028)	(0.025)	(0.067)	(0.023)	(0.035)	(0.030)
Household Head Characteristics								
Sex of Head (Male)	-0.071***	-0.041***	-0.021*	-0.070***	-0.069***	-0.003	0.013	-0.001
	(0.009)	(0.012)	(0.012)	(0.012)	(0.015)	(0.014)	(0.020)	(0.022)
Age of Head	0.011***	0.002	0.006***	0.007***	0.013***	0.003**	0.008***	0.009***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Marital Status of Head	0.031***	0. 026**	-0.003	0.029***	0.018*	-0.003	-0.004	0.0002
	(0.007)	(0.011)	(0.011)	(0.010)	(0.011)	(0.010)	(0.014)	(0.016)
Spouse of Head Present	0.028***	0.014	0.019	0.043***	0.002	0.016	0.005	0.006
	(0.009)	(0.013)	(0.013)	(0.012)	(0.015)	(0.012)	(0.017)	(0.018)
Head Ever Been To School	0.034***	0.027***	0.032***	0.040***	0.009	0.034***	0.048***	0.048***
	(0.009)	(0.010)	(0.011)	(0.011)	(0.017)	(0.009)	(0.013)	(0.014)
Highest Education Complete(Head)	0.007***	0.007***	0.006***	0.007***	0.008**	0.007***	0.007***	0.004
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)
Household Characteristics								
Average Household Age	-0.012***	-0.003*	-0.005***	-0.007***	-0.014***	0.001	-0.003	-0.005***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)

Average age of Children in School	0.016***	0.014***	0.015***	0.020***	0.007**	0.016***	0.010***	0.020***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)
Proportion in 0-4 age group	-0.044	-0.146**	-0.269***	0.054	-0.162**	-0.038	-0.107	-0.130*
	(0.052)	(0.071)	(0.066)	(0.072)	(0.073)	(0.053)	(0.070)	(0.072)
Proportion in 5-9 age group	0.551***	0.048	0.077	0.608***	0.481***	0.558***	0.164***	0.140**
	(0.047)	(0.062)	(0.062)	(0.063)	(0.066)	(0.047)	(0.065)	(0.069)
Proportion in 10-14 age group	0.514***	0.130**	0.146***	0.606***	0.353***	0.523***	0.753***	0.318***
	(0.043)	(0.057)	(0.057)	(0.058)	(0.062)	(0.043)	(0.055)	(0.064)
Proportion in 15-19 age group	0.258***	-0.049	-0.109**	0.316***	0.150***	0.245***	0.294***	0.543***
	(0.039)	(0.054)	(0.052)	(0.053)	(0.054)	(0.040)	(0.051)	(0.052)
Proportion in 20-29 age group	-0.096***	-0.064	-0.124***	-0.110***	-0.096***	-0.096***	-0.015	0.049
	(0.028)	(0.040)	(0.040)	(0.038)	(0.038)	(0.028)	(0.038)	(0.041)
Household Size	0.026***	0.015**	0.021***	0.026***	0.029***	0.026***	0.031***	0.034***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)	(0.003)	(0.003)
Household Assets								
Owns Radio	0.033***	0.020**	0.034***	0.038***	0.023**	0.033***	0.031***	0.032***
	(0.007)	(0.008)	(0.008)	(0.009)	(0.012)	(0.007)	(0.012)	(0.011)
Cement Floor	0.047***	0.051***	0.042***	0.053***	0.004	0.049***	0.020	0.039***
	(0.008)	(0.009)	(0.009)	(0.009)	(0.025)	(0.008)	(0.017)	(0.013)
Owns Fridge	0.022*	0.002	0.013	0.056**	0.008	0.021	0.035***	0.023
	(0.013)	(0.016)	(0.016)	(0.027)	(0.014)	(0.013)	(0.010)	(0.019)
Fuel Used in Lighting	0.063***	0.038*	0.051**	0.058***	0.069***	0.063***	0.097***	0.059***
	(0.016)	(0.020)	(0.021)	(0.021)	(0.026)	(0.016)	(0.026)	(0.022)
Access to in-House Sanitation	0.034***	0.037***	0.030***	0.032***	0.007	0.032***	0.042***	0.013
	(0.009)	(0.010)	(0.011)	(0.012)	(0.017)	(0.009)	(0.013)	(0.014)
Owns Telephone	0.011	0.071***	0.022	0.059**	0.019	0.011	0.024*	0.020
	(0.011)	(0.023)	(0.017)	(0.026)	(0.013)	(0.011)	(0.014)	(0.015)
Area/Location								

Rural	-0.035*** (0.009)	-0.048*** (0.011)	-0.022** (0.011)	(omitted)	(omitted)	-0.036*** (0.010)	-0.043*** (0.013)	-0.049*** (0.014)
Panel B: First Stage Result								
Number of Remitters to Household	0.146*** (0.004)	0.146*** (0.005)	0. 144 *** (0.004)	0.146*** (0.005)	0.143*** (0.006)	0.146*** (0.004)	0.140*** (0.005)	0.150*** (0.006)
Regional Bank Branches*Origin of Remittance	0.016*** (0.002)	0. 014 *** (0.002)	0.014*** (0.002)	0.021*** (0.002)	0.012*** (0.002)	0.016*** (0.002)	0.017*** (0.002)	0.016*** (0.002)
Transformed ϱ	-0.314*** (0.089)	-0.113*** (0.119)	-0.252** (0.117)	-0.342*** (0.093)	-0.204*** (0.049)	-0.321*** (0.090)	-0.320** (0.149)	-0.188* (0.117)
ϱ [22]	-0.304 (0.081)	-0.113 (0.117)	-0.247 (0.110)	-0.329 (0.083)	-0.309 (0.312)	-0.310 (0.081)	-0.309 0.135	-0.187 (0.113)
Wald Test of Exogeneity	19.32	9.53	17.97	11.20	10.33	16.75	2.51	2.92
P-Value	0.000	0.002	0.000	0.008	0.001	0.0000	0.073	0.082
F-test of Instruments (Chi2(2))	1320.24	871.32	877.96	864.48	421.88	1295.04	626.88	565.28
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	13708	8921	8861	8802	4906	13444	7179	5909
Log Likelihood	-8164.5467	-4758.5978	-4810.9273	-5320.298	-2660.5251	-7991.4409	4180.787	-3433.973

Source: Author's computation from GLSS 3-5 Data. Standard errors are shown in parenthesis. ****, **, * Significant at 1%, 5% and 10% respectively. Other variables included in the model are age of household head squared, 2 household head religion and 3 household head ethnicity dummies; average household age squared, average age of children in school squared, proportion of female in household; ownership of land, TV and home, number of rooms in home, fuel used in cooking, distance to source of drinking water, connection to electricity grid, 4 income quintile dummies; distance to nearest post office, bank, and motorable road, 9 regional and 2 year dummies.

[22] The parameter **ϱ** *(rho)* is bounded in value between 1 and -1.It is therefore not appropriate to be used as a basis for testing the null hypothesis that the correlation between error terms is equal to zero. As an alternative, of *rho* is transformed into an unbounded scale using its arc-hyperbolic tangents "transformed ϱ"(Roodman 2009)

Table A3: Effect of Remittances on Years of Education Completed

	1	2	3	4	5	6	7	8
	All		Gender		Area		Level of Education	
	Full Model	Boys	Girls	Rural	Urban			
	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)
Receive Remittances	0.018**	0.031***	0.019*	0.023***	0.004	0.015***	0.010**	0.041***
	(0.010)	(0.012)	(0.013)	(0.014)	(0.010)	(0.010)	(0.013)	(0.016)
Household Head Characteristics								
Sex of Head	0.006	0.011	0.012	0.017*	-0.003	0.007	0.009	0.004
	(0.006)	(0.007)	(0.007)	(0.009)	(0.005)	(0.006)	(0.008)	(0.010)
Age of Head	0.002***	0.003***	0.003***	0.001	0.002***	0.003***	0.002***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Marital Status of Head	0.009***	0.012***	0.013***	0.009	0.008***	0.010***	0.007	0.012**
	(0.004)	(0.005)	(0.005)	(0.006)	(0.003)	(0.004)	(0.005)	(0.006)
Spouse of Head Present	-0.328	-0.119	-0.449	-0.245	-0.905	-0.003	-0.011	-0.008
	(0.436)	(0.561)	(0.596)	(0.519)	(0.761)	(0.006)	(0.007)	(0.009)
Head Ever Been To School	0.139***	0.117***	0.124***	0.181***	0.071***	0.141***	0.137***	0.159***
	(0.004)	(0.005)	(0.006)	(0.006)	(0.006)	(0.004)	(0.009)	(0.011)
Highest Education Completed (Head)	0.009***	0.008***	0.007***	0.006***	0.010***	0.009***	0.008***	0.008***
	(0.0004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Household Characteristics								
Average Household Age	-0.003***	-0.003***	-0.003***	-0.003***	-0.002***	-0.003***	-0.003***	-0.003***
	(0.0004)	(0.001)	(0.001)	(0.001)	(0.000)	(0.0004)	(0.0005)	(0.001)
Average age of Children in School	-0.0003	-0.002**	0.000	0.002**	-0.002***	-0.001**	-0.0002	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Average age of Children in	0.0004***	0.0005***	0.0004***	0.0004***	0.0003	0.0005***	0.0003***	0.0001***

School Squared	(0.00004)	(0.0001)	(0.00005)	(0.0001)	(0.00004)	(0.0004)	(0.0001)	(0.0001)
Proportion in 0-4 age group	-0.160***	-0.184***	-0.206***	-0.205***	-0.107***	-0.147***	-0.131***	-0.156***
	(0.018)	(0.024)	(0.027)	(0.030)	(0.015)	(0.018)	(0.024)	(0.028)
Proportion in 5-9 age group	-0.048***	-0.041*	-0.042*	-0.065**	-0.042***	-0.035**	-0.053***	-0.093***
	(0.016)	(0.022)	(0.025)	(0.027)	(0.014)	(0.016)	(0.021)	(0.026)
Proportion in 10-14 age group	0.143***	0.131***	0.143***	0.194***	0.065***	0.159***	0.155***	0.116***
	(0.015)	(0.022)	(0.023)	(0.026)	(0.016)	(0.015)	(0.020)	(0.024)
Proportion in 15-19 age group	0.173***	0.168***	0.173***	0.221***	0.088***	0.174***	0.144***	0.169***
	(0.014)	(0.020)	(0.021)	(0.024)	(0.016)	(0.014)	(0.018)	(0.024)
Proportion in 20-29 age group	0.046***	0.044***	0.053***	0.030**	0.027***	0.045***	0.054***	0.052***
	(0.010)	(0.015)	(0.016)	(0.017)	(0.010)	(0.010)	(0.013)	(0.015)
Household Size	0.020***	0.019***	0.020***	0.024***	0.015***	0.020***	0.020***	0.022***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Household Assets								
Owns TV	0.010***	0.014***	0.016***	0.013*	0.005*	0.012***	0.006	0.005
	(0.003)	(0.004)	(0.004)	(0.007)	(0.003)	(0.003)	(0.004)	(0.006)
Cement Floor	0.013***	0.013***	0.013***	0.022***	-0.001	0.016***	0.015	0.017***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.003))	(0.004)	(0.005)
Owns Fridge	0.018***	0.017***	0.019***	0.037***	0.006**	0.017***	0.012	0.017***
	(0.004)	(0.005)	(0.005)	(0.009)	(0.003)	(0.004)	(0.005)	(0.006)
Fuel Used in cooking	0.025***	0.017***	0.029***	0.041**	0.012***	0.020***	0.019	0.024***
	(0.005)	(0.006)	(0.006)	(0.021)	(0.003)	(0.005)	(0.006)	(0.008)
Access to in-House Sanitation	0.017***	0.019***	0.015***	0.021***	0.005	0.016***	0.023	0.019***
	(0.003)	(0.004)	(0.004)	(0.005)	(0.003)	(0.003)	(0.004)	(0.005)
Owns Telephone	0.016***	0.020***	0.018***	0.029***	0.004**	0.016***	0.018	0.022***
	(0.003)	(0.003)	(0.003)	(0.006)	(0.002)	(0.003)	(0.004)	(0.005)
Area/Location								
Rural	-0.002	-0.006	0.002	(omitted)	(omitted)	-0.002	-0.006	0.005

	(0.003)	(0.004)	(0.004)			(0.003)	(0.004)	(0.005)
Panel B: First Stage Result								
Number of Remitters to House-hold	0.147*** (0.004)	0.147*** (0.005)	0.145*** (0.004)	0.148*** 0.004)	0.144*** (0.006)	0.147*** (0.004)	0.141*** (0.005)	0.150*** (0.006)
Regional Bank Branches*Origin of Remittance	0.015*** (0.002)	0.013*** (0.002)	0.013*** (0.002)	0.020*** (0.002)	0.010*** (0.003)	0.015*** (0.002)	0.016*** (0.002)	0.015*** (0.002)
Transformed ϱ	-0.064** (0.034)	-0.114*** (0.042)	-0.060 (0.042)	-0.026 (0.040)	-0.051 (0.060)	-0.321*** (0.090)	-0.019* (0.049)	-0.124 (0.052)
ϱ	-0.033 (0.034)	-0.035 (0.041)	-0.015 (0.042)	--0.098** (0.040)	-0.030 (0.060)	-0.310 (0.081)	-0.019 (0.049)	-0.123 (0.051)
Overid. Sargan test (Chi-sq.)	0.002	1.118	1.192	1.171	7.572	0.7011	0.071	0.649
P-value	0.965	0.290	0.275	0.279	0.005	0.147	0.7905	0.4205
F-test of Instruments (Chi2(2))	2065.55	1323.2	1333.21	1508.21	633.6	1295.04	1040.1	919.01
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	13708	8921	8861	8802	4906	13444	7179	5909
Log Likelihood	-30174.951	-20663.286	-20253.991	-17889.167	-11970.357	-29491.123	-14674.893	-11935.639
Left Censored Observation	5844	3545	3627	4063	1781	5730	3553	3022
Uncensored Observation	7863	5375	5233	4738	3124	7713	3625	2886

Source: Author's computation from GLSS 3-5 Data. Standard errors are shown in parenthesis. ****, **, * Significant at 1% (p<0.01), 5 %(p<0.05) and 10% (p<0.1) respectively. Other variables included in the model are age of household head squared, 2 household head religion and 3 household head ethnicity dummies; average household age squared, average age of children in school squared, proportion of female in household; ownership of land, radio, and home, number of rooms in home, fuel used in lighting, distance to source of drinking water, connection to electricity grid, 4 income quintile dummies; distance to nearest post office, bank, and motorable road, 9 regional and 2 year dummies

Table A4: Effect of Remittances on Number of Children in School

	1	2	3	4	5	6	7	8
	All		Gender		Area		Level Of Education	
	Full Model	Boys	Girls	Rural	Urban	Primary	Jun. Sec.	Sen. Sec
	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)	Marginal Effect (SE)
Receive Remittances	0.044***	0.031***	0.035	0.047***	0.041***	0.044***	0.027*	0.056***
	(0.012)	(0.011)	(0.012)	(0.017)	(0.017)	(0.012)	(0.017)	(0.020)
Household Head Characteristics								
Sex of Head	-0.011*	-0.006	-0.005	-0.002	-0.023***	-0.010	-0.008	-0.014
	(0.007)	(0.006)	(0.006)	(0.010)	(0.008)	(0.007)	(0.009)	(0.011)
Age of Head	0.002***	0.001*	0.001*	0.001	0.003***	0.002***	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Marital Status of Head	0.014**	0.014***	0.013***	0.011	0.015***	0.014***	0.010	0.020***
	(0.005)	(0.004)	(0.005)	(0.007)	(0.006)	(0.005)	(0.006)	(0.008)
Spouse of Head Present	-0.009	-0.006	-0.005	-0.009	-0.004	-0.009	-0.013	-0.007
	(0.006)	(0.005)	(0.005)	(0.008)	(0.007)	(0.006)	(0.008)	(0.009)
Head Ever Been To School	0.031***	0.018***	0.024***	0.031***	0.023***	0.032***	0.030***	0.038***
	(0.004)	(0.004)	(0.004)	(0.006)	(0.007)	(0.004)	(0.006)	(0.007)
Highest Education Com-plete(Head)	0.005***	0.003***	0.005***	0.006***	0.003***	0.005**	0.006***	0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Household Characteristics								
Average Household Age	-0.006***	-0.005***	-0.006***	-0.006***	-0.007***	-0.006***	-0.006***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001	(0.001)	(0.001)	(0.001)	(0.001)
Average age of Children in School	0.011***	0.008***	0.009***	0.016***	0.004***	-0.234***	-0.420***	-0.474***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.026)	(0.037)	(0.045)

Proportion in 0-4 age group	-0.246***	-0.191***	-0.238***	-0.283***	-0.202***	-0.234***	-0.420***	-0.474***
	(0.026)	(0.024)	(0.027)	(0.037)	(0.034)	(0.026)	(0.037)	(0.045)
Proportion in 5-9 age group	0.403***	0.232***	0.257***	0.388***	0.400***	0.411***	0.157***	0.100***
	(0.023)	(0.022)	(0.025)	(0.033)	(0.030)	(0.023)	(0.033)	(0.041)
Proportion in 10-14 age group	0.448***	0.281***	0.313***	0.454***	0.411***	0.456***	0.450***	0.272***
	(0.021)	(0.021)	(0.023)	(0.031)	(0.028)	(0.022)	(0.029)	(0.037)
Proportion in 15-19 age group	0.251***	0.160***	0.158***	0.248***	0.235***	0.242***	0.187***	0.359***
	(0.020)	(0.019)	(0.021)	(0.029)	(0.025)	(0.020)	(0.027)	(0.032)
Proportion in 20-29 age group	-0.059***	-0.031**	-0.049***	-0.089***	-0.039**	-0.058***	-0.057***	-0.004
	(0.015)	(0.014)	(0.016)	(0.021)	(0.018)	(0.015)	(0.022)	(0.027)
Household Size	0.055***	0.037***	0.041***	0.054***	0.058***	0.055***	0.050***	0.047***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Household Assets								
Owns Land	0.015***	0.014***	0.014***	0.024***	-0.004	0.015***	0.008	0.008
	(0.005)	(0.004)	(0.004)	(0.008)	(0.005)	(0.005)	(0.006)	(0.007)
Owns TV	0.012***	0.008**	0.011**	0.012	0.011**	0.013***	0.006	0.007
	(0.005)	(0.004)	(0.005)	(0.008)	(0.005)	(0.005)	(0.006)	(0.008)
Owns Radio	0.007**	0.004	0.005	0.012***	0.001	0.006*	0.009*	0.008
	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.003)	(0.005)	(0.006)
Cement Floor	0.018***	0.016	0.015***	0.019***	0.010	0.019***	0.022***	0.020***
	(0.004)	(0.003)	(0.004)	(0.005)	(0.010)	(0.004)	(0.006)	(0.007)
Fuel Used in Lighting	0.025***	0.016***	0.014**	0.040***	0.006	0.025***	0.022**	0.022**
	(0.008)	(0.006)	(0.007	(0.011)	(0.010)	(0.008)	(0.011)	(0.011)
Access to in-House Sanitation	0.037***	0.030***	0.028***	0.041***	0.005	0.035***	0.049***	0.039***
	(0.004)	(0.004)	(0.004)	(0.006)	(0.007)	(0.004)	(0.006)	(0.007)
Owns Telephone	0.012***	0.010***	0.009**	0.043***	-0.005	0.013***	0.011**	0.011
	(0.004)	(0.004)	(0.004)	(0.009)	(0.004))	(0.004)	(0.005)	(0.007)
Distance to Nearest Water Source	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0001	-0.0002***	-0.0002**	-0.001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)

Area/Location								
Distance to Nearest Motorable Road	-0.001*** (0.0003)	-0.001** (0.0003)	-0.001*** (0.0003)	-0.001* (0.0004)	-0.014*** (0.004)	-0.0009 (0.0003)	-0.0005 (0.0003)	-0.0002 (0.0004)
Rural	-0.005 (0.004)	-0.010*** (0.004)	-0.004 (0.004)	(omitted)	(omitted)	-0.006 (0.004)	-0.007 (0.006)	0.002 (0.007)
Panel B: First Stage Results								
Number of Remitters to Household	0.146*** (0.004)	0.147*** (0.005)	0.145*** (0.004)	0.147*** (0.004)	0.144*** (0.006	0.147*** (0.004)	0.141*** (0.005)	0.150*** (0.006)
Regional Bank Branches*Origin of Remittance	0.015*** (0.002)	0.014*** (0.002)	0.013*** (0.002)	0.020*** (0.002)	0.010*** (0.003)	0.015*** (0.002)	0.017 (0.002)	0.016*** (0.002)
Transformed ϱ	-0.081** (0.025)	-0.075*** (0.030)	-0.066** (0.030)	-0.059** (0.030)	-0.127*** (0.044)	-0.079 (0.025)	-0.060*** (0.039)	-0.119*** (0.045)
ϱ	-0.081 (0.025)	-0.075 (0.030)	-0.066 (0.030)	-0.059 (0.030)	-0.126 (0.044)	-0.079 (0.025)	-0.060 (0.039)	-0.119 (0.044)
Overid. Sargan test (Chi-sq.)	1.110	4.584	2.854	0.005	17.049	0.9	11.086	5.586
P-value	0.292	0.323	0.0911	0.945	0.105	0.3428	0.355	0.181
F-test of Instruments (Chi2(2))	2065.480	1323.170	1333.19	1508.18	633.58	2038.01	1040.09	918.99
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	13708	8921	8861	8802	4906	13444	7179	5909
Log Likelihood	-20187.381	-14713.811	-14446.583	-13036.091	-6690.2588	-19779.78	-9027.655	-6807.6402
Left Censored Observations	3287	979	1147	2342	945	3287	3287	3287
Uncensored Observations	10420	7341	7713	6459	3960	10156	3891	2621

Source: Author's computation from GLSS 3-5 Data. Standard errors in parenthesis. ****, **, * Significant at 1%, 5% and 10% respectively. Other variables included in the model are age of household head squared, 2 household head religion and 3 household head ethnicity dummies; average household age squared, average age of children in school squared, proportion of female in household; ownership home and fridge; number of rooms in home, fuel used in cooking, distance to source of drinking water, connection to electricity grid, distance to nearest post office and bank, 9 regional and 2 year dummies

Table A5: Effect of Remittances on Total Annual Expenditure on Education

	1	2	3	4	5	6	7	8
	All		Gender		Area		Level Of Education	
	Full Model	Boys	Girls	Rural	Urban	Primary	Jun. Sec.	Sen. Sec
	Coefficient Std. Err.	Coefficient Std. Err.	Coefficient Std. Err.	Coefficient Std. Err.	Coefficient Std. Err.	Coefficient Std. Err.	Coefficient Std. Err.	Coefficient Std. Err.
Receive Remittances	0.611*** (0.102)	0.603*** (0.129)	0.745 *** (0.127)	0.600 *** (0.123)	0.729 *** (0.182)	0.608*** (0.102)	0.588*** (0.152)	0.302* (0.166)
Household Head Characteristics								
Sex of Head	0.039 (0.055)	-0.024 (0.069)	0.054 (0.068)	-0.036 (0.070)	0.178 ** (0.093)	0.040 (0.056)	0.060 (0.080)	0.017 (0.094)
Age of Head	0.022*** (0.006)	0.002 (0.008)	0.020*** (0.007)	-0.002 (0.008)	0.050 *** (0.010)	0.023*** (0.006)	0.042*** (0.009)	0.046*** (0.010)
Marital Status of Head	0.008 (0.039)	0.007 (0.050)	0.007 (0.049)	0.064 (0.051)	-0.097 (0.061)	0.005 (0.039)	-0.016 (0.057)	0.039 (0.065)
Spouse of Head Present	0.027 (0.046)	0.056 (0.058)	-0.003 (0.057)	0.051 (0.059)	-0.024 (0.080)	0.062 (0.054)	0.152 (0.091	0.113 (0.112
Head Ever Been To School	0.107** (0.035)	0.062 (0.043)	0.069 (0.043)	0.108*** (0.042)	0.076 (0.072)	0.102*** (0.036)	0.151*** (0.052)	0.118** (0.059)
Highest Education Completed (Head)	0.016** (0.007)	0.015** (0.008)	0.018 (0.008)	0.016 ** (0.008)	0.013 (0.014)	0.016** (0.007)	0.022** (0.010)	0.025** (0.011)
Household Characteristics								
Average Household Age	-0.001 (0.006)	-0.002 (0.010)	-0.016** (0.008)	0.034 *** (0.011)	-0.023*** (0.009)	-0.001 (0.007)	-0.014* (0.008)	-0.019*** (0.007)
Average age of Children in School	0.019*** (0.006)	0.013 (0.009)	0.023*** (0.008)	0.027 *** (0.009)	0.005 (0.010)	0.017*** (0.007)	0.004 (0.011)	0.041*** (0.011)

Proportion in 0-4 age group	-0.251	-0.626**	-1.022***	0.063	-0.669 **	-0.233	-0.227	-0.327
	(0.210)	(0.309)	(0.283)	(0.281)	(0.328)	(0.213)	(0.293)	(0.308)
Proportion in 5-9 age group	1.283***	0.238	0.012	1.426 ***	1.156 ***	1.314***	0.814***	0.725***
	(0.189)	(0.275)	(0.263)	(0.250)	(0.300)	(0.192)	(0.271)	(0.291)
Proportion in 10-14 age group	1.221***	0.433*	0.277	1.439 ***	0.834 ***	1.247***	2.027***	1.078***
	(0.173)	(0.250)	(0.241)	(0.228)	(0.274)	(0.176)	(0.239)	(0.268)
Proportion in 15-19 age group	0.785***	0.130	-0.195	0.979 ***	0.426 *	0.811***	1.043***	1.617***
	(0.157)	(0.232)	(0.221)	(0.208)	(0.249)	(0.160)	(0.216)	(0.230)
Proportion in 20-29 age group	-0.217*	-0.089	-0.326**	-0.213	-0.329 *	-0.227**	0.013	0.161
	(0.113)	(0.174)	(0.169)	(0.151)	(0.176)	(0.115)	(0.164)	(0.176)
Household Size	0.082***	0.064***	0.072***	0.069 ***	0.124 ***	0.080***	0.098***	0.100***
	(0.007)	(0.009)	(0.009)	(0.009)	(0.015)	(0.008)	(0.011)	(0.012)
Household Assets								
Owns Radio	0.115***	0.130***	0.088***	0.139 ***	0.027	0.119***	0.142***	0.148***
	(0.028)	(0.035)	(0.035)	(0.035)	(0.051)	(0.029)	(0.042)	(0.047)
Owns Home	-0.106***	-0.099***	-0.110***	-0.100 ***	-0.104 **	-0.105***	-0.108***	-0.110**
	(0.028)	(0.034)	(0.034)	(0.034)	(0.052)	(0.028)	(0.042)	(0.047)
Cement Floor	0.151***	0.160***	0.140***	0.151 ***	-0.038	0.153***	0.088*	0.090
	(0.034)	0.041)	(0.041)	(0.037)	(0.108)	(0.035)	(0.052)	(0.058)
Fuel Used in Lighting	0.169***	0.093	0.123	0.144	0.144	0.164***	0.330***	0.216**
	(0.064)	(0.076)	(0.077)	(0.089)	(0.106)	(0.064)	(0.100)	(0.092)
Access to in-House Sanitation	0.041	0.051	0.046	0.015	-0.035	0.044	0.089*	-0.007
	(0.036)	(0.043)	(0.044)	(0.044)	(0.071)	(0.036)	(0.053)	(0.060)
Second Income Quintile (National)	0.281***	0.317***	0.266***	0.165 ***	0.599 ***	0.280***	0.285***	0.301***
	(0.039)	(0.044)	0.045 ***	(0.046)	0.077	(0.039)	(0.059)	(0.068)
Third Income Quintile (National)	0.396***	0.435***	0.394***	0.238***	0.721***	0.395***	0.417***	0.395***
	(0.040)	(0.047)	(0.047)	(0.048)	(0.077)	(0.040)	(0.060)	(0.068)
Fourth Income Quintile (National)	0.536***	0.563***	0.577***	0.338***	0.904***	0.533***	0.509***	0.502***
	(0.041)	(0.050)	(0.050)	(0.051)	(0.077)	(0.042)	(0.062)	(0.071)

Fifth Income Quintile (National)	0.650***	0.683***	0.662***	0.470***	1.008***	0.648***	0.614**	0.612***
	(0.046)	(0.057	(0.057)	(0.058)	(0.084	(0.046)	(0.068)	(0.076)
Area/Location								
Distance to Nearest Post Office	0.003***	0.003***	0.003***	0.002***	-0.073**	0.164***	0.330***	0.216**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.035)	(0.064)	(0.100)	(0.092)
Distance to Nearest Bank	-0.003***	-0.004***	-0.004***	-0.003***	0.013	0.044	0.089*	-0.007
	(0.001)	(0.001)	(0.001)	(0.001)	(0.032)	(0.036)	(0.053)	(0.060)
Rural	-0.335***	-0.407***	-0.362***	(omitted)	(omitted)	-0.344***	-0.301***	-0.327***
	(0.035)	(0.044)	(0.043)			(0.035)	(0.051)	(0.057)
Panel B: First Stage Result								
Number of Remitters to Household	0.145***	0.146***	0.143***	0.146***	0.144***	0.146***	0.139***	0.150***
	(0.004)	(0.005)	(0.004)	(0.005)	(0.006)	(0.004)	(0.005)	(0.006)
Regional Bank Branches*Origin of Remittance	0.016***	0.014***	0.014***	0.022***	0.010***	0.016***	0.017***	0.015***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Transformed ϱ	-0.159***	-0.136***	-0.200***	-0.146***	-0.201***	-0.161***	-0.141***	-0.048
	(0.033)	(0.042)	(0.041)	(0.039)	(0.060)	(0.033)	(0.048)	(0.052)
ϱ	-0.157	-0.135	-0.198	-0.145	-0.198	-0.159	-0.140	-0.048
	(0.032)	(0.041)	(0.039)	(0.038)	(0.058)	(0.032)	(0.047)	(0.052)
Overid. Sargan test (Chi-sq.)	1.345	1.977	5.956	18.983	0.959	1.334	18.487	10.697
P-value	0.246	0.160	0.147	0.105	0.328	0.2481	0.098	0.110
F-test of Instruments (Chi2(2))	2064.75	1322.79	1332.46	1507.270	633.600	2037.25	1039.38	919.00
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	13708	8921	8861	8802	4906	13444	7179	5909
Log Likelihood	-10319.6	-6728.323	-6648.2891	-6363.361	-3697.785			

Source: Author's computation from GLSS 3-5 Data. Standard errors in parenthesis. ****, **, * Significant at 1%, 5% and 10% respectively. Source: Author's computation from GLSS 3-5 Data. Standard errors are shown in parenthesis. ****, **, * Significant at 1%, 5% and 10% respectively. Other variables included in the model are age of household head squared, 2 household head religion and 3 household head ethnicity dummies; average household age squared, average age of children in school squared, proportion of female in household; ownership of land, TV and home, number of rooms in home, fuel used in cooking, distance to source of drinking water, connection to electricity grid, distance to nearest motorable road, 9 regional and 2 year dummies

Appendix C: Definitions

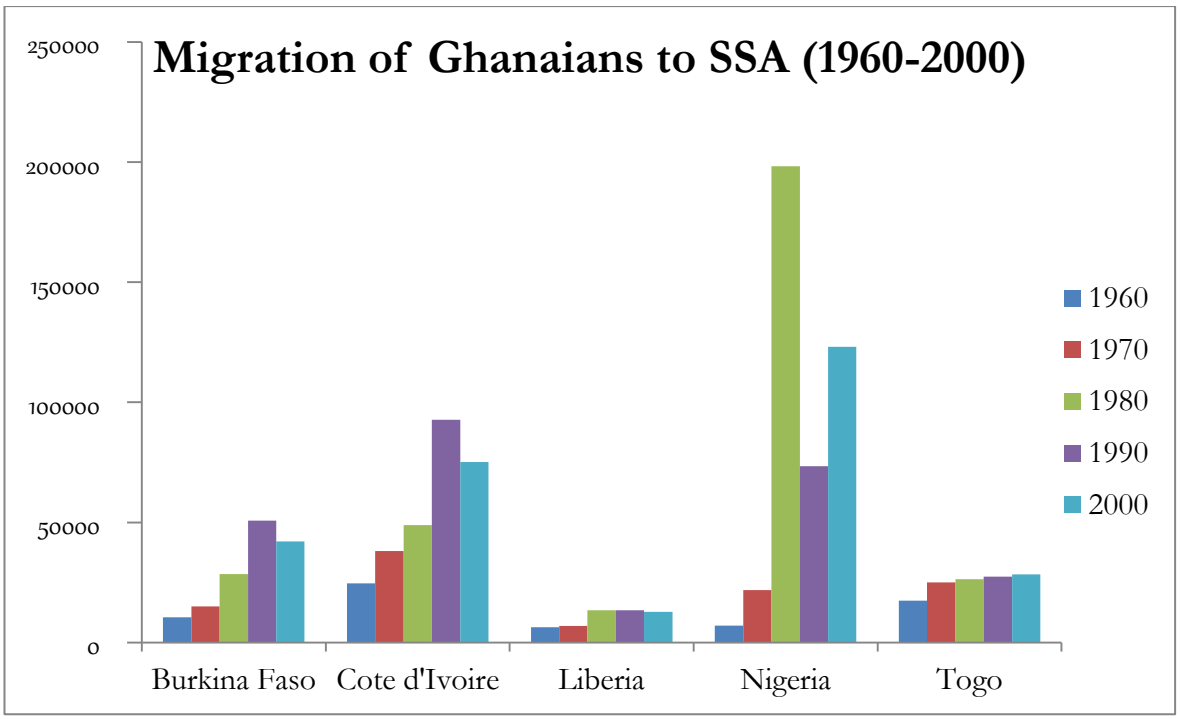
The Ghana Statistical Service defines a household as groups of people who normally sleep, share the same housekeeping arrangements and took meals in the same place of abode for the 9 out of the 12 months before the survey was conducted. Based on this definition, households generally included a husband, wife/wives and children, grandparents, nephews, nieces and other extended family members. This definition is in line with the type of family system practiced in Ghana. Household members are defined as people who slept and took their meals together for the last 9 months in the year preceding the interview. Apart from the household head who was not present for 9 or more months, seasonal workers or students who were not part of or living in another household, or anyone who was away from the household for more three months was not regarded as a household member. The head of the household is anyone who is responsible for taking decisions that had welfare implications on the household as well as providing for the needs of the household.

Appendix D: International Migration in Ghana

Main Migrant Destination of Ghanaians

Migration has become one of the defining issues in the twenty-first century in Ghana and other parts of Africa. In spite of this, the phenomenon is mainly undocumented and informal resulting in inaccurate or non-existent data. The main migrant destination of Ghanaians is to the Sub-Saharan African Region. Despite the expulsion of Ghanaians from Nigeria in the 1980s, it is still the most popular destination for Ghanaian migrants. The country experienced the highest migration in the 1980. The main factors to blame for this were the political instability the country experienced in the 1980s, the 1983 drought as well as the implementation of the World Bank's SAP. Although migration declined in the 1990, the there was an increase in 2000.

Figure A1: Main Ghanaian Migrant Destination (Sub-Sahara Africa)

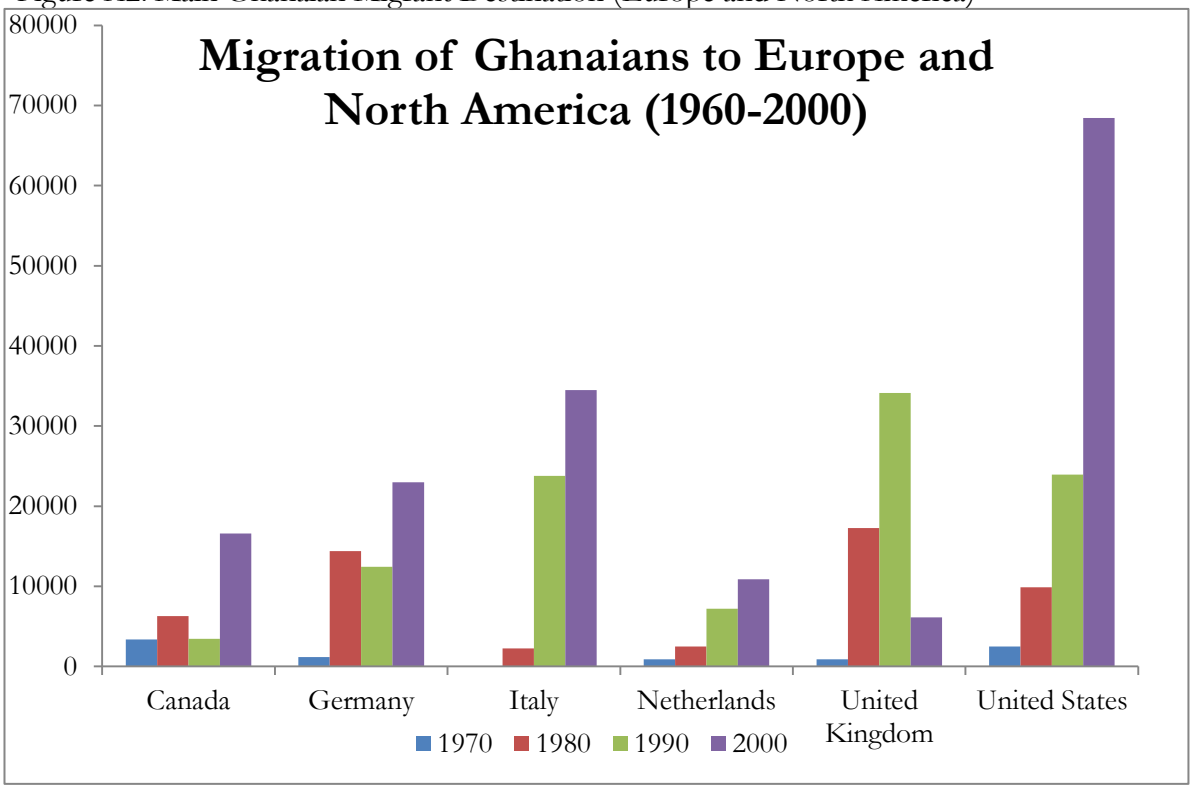


Source: Author's conputation from World Bank's Data on Global Bilateral Migration

Outside of the region, the United States is the most popular destination among Ghanaian migrants, followed by Italy. Before the year 2000, the data showed that the UK was the most popular destination. The increasing immigration controls being introduced by the British government is a most likely reason for the decline in the number of migrants to the UK. The UK government recently (June 2013) categorised Ghana among a number of countries that were considered 'high risk', whose nationals are likely to or have abused their visas.

Outside of these 2 regions, India, Australia and Japan (Asia and the Pacific) and Jamaica (Caribbean) have also had some Ghana migrants.

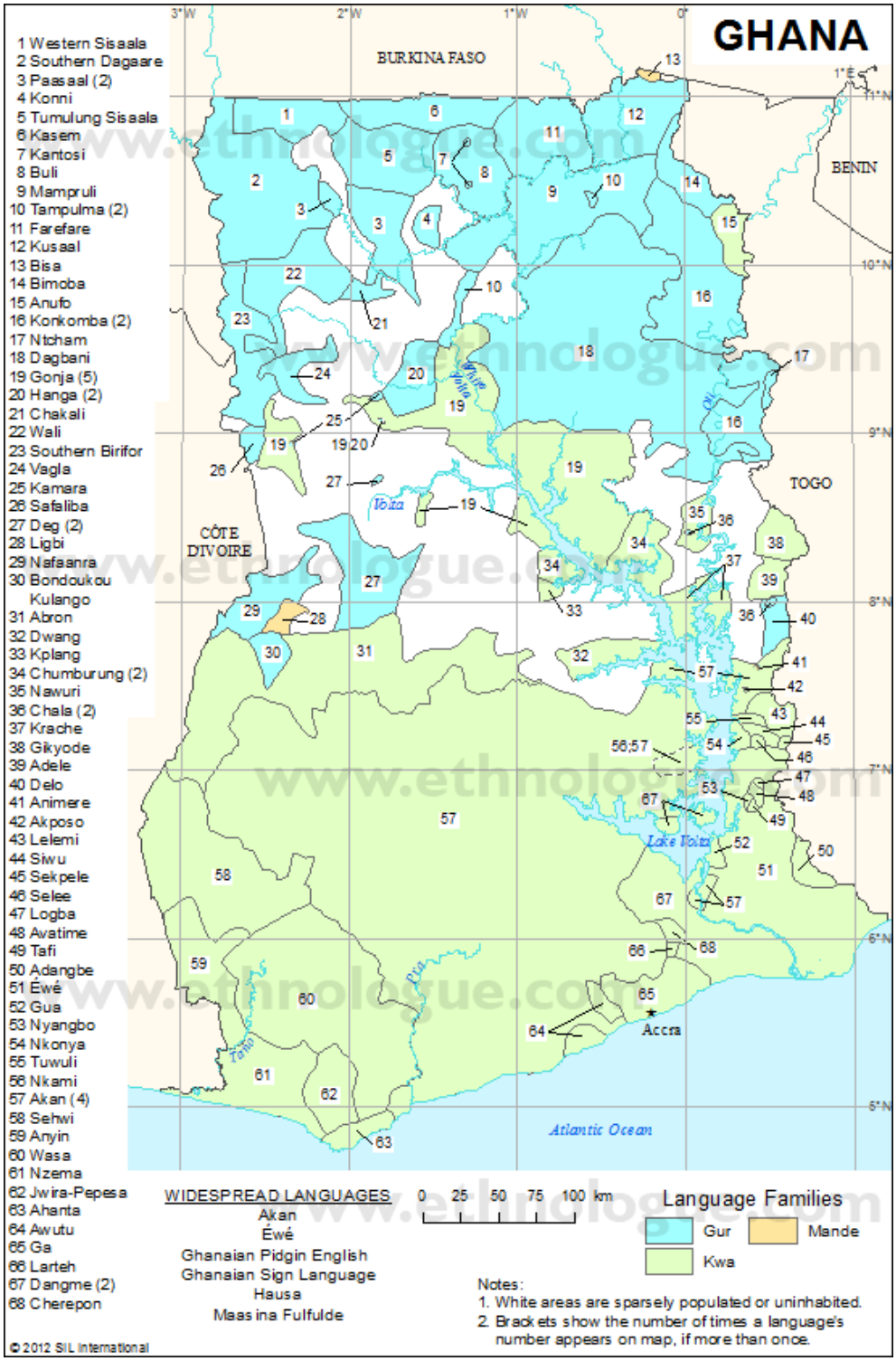
Figure A2: Main Ghanaian Migrant Destination (Europe and North America)



Source: Author's conputation from World Bank's Data on Global Bilateral Migration

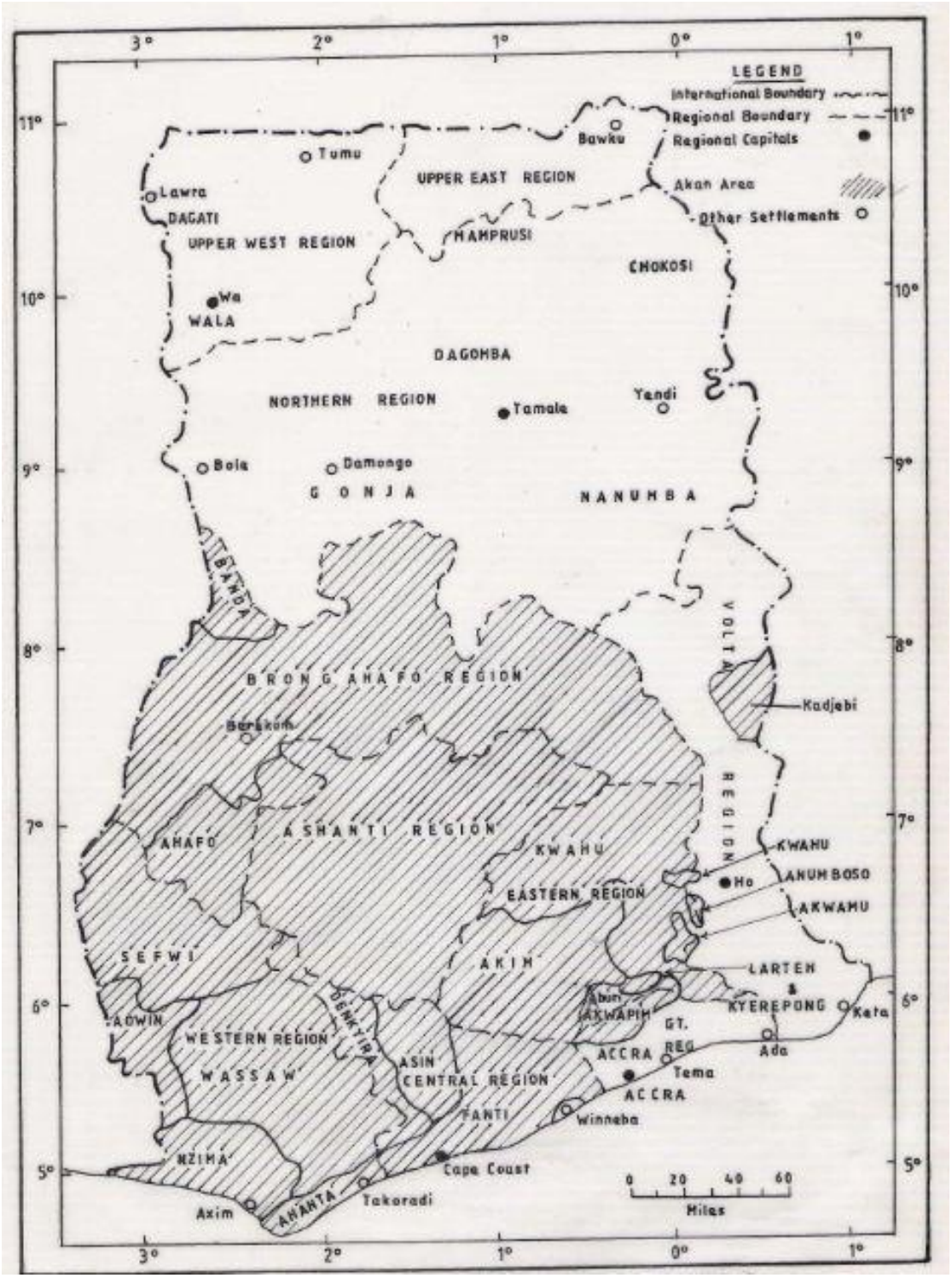
Appendix E: Maps

Map 1: Ethnologic Map of Ghana



Source: Ethnologue, International Linguistics Centre (http://www.ethnologue.com/map/GH) Accessed on October 19, 2013

Map 2: Map of Ghana Showing Akan Areas



Source: The Purdue Peace Project http://www.cla.purdue.edu/ppp/Projects.html: Accessed on October 19, 2013