Household remittance inflows and child education in Ghana: Exploring the gender and locational dimensions

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Abstract

This paper investigates the effect of household remittance inflows on child education in Ghana using data from the Ghana Living Standards Survey Six (GLSS 6). Employing an instrumental variable approach and including children at the nursery and kindergarten levels in our study, the following findings are established. First, remittance inflows generally reduce household liquidity constraints, translating into increased number of school hours for their children. Second, while remittance inflow improves child education in the urban areas, it reduces school hours for their counterparts in rural communities. Third, gains in school hours from remittance inflows are much greater for boys but do not make any or much of a difference in improving that of the girl-child. We call for financial system regulations that help to substantially reduce transaction costs on (or rigidities in) remittance inflows so that its influence on child education outcomes will be improved.

Keywords: Remittances, child education, gender, rural, instrumental variable, household

JEL Classification: I20, I30, D64

1 Introduction

Remittances have become an important source of income in many households in developing countries. The total flow of international remittances to developing countries was $429 billion in 2016. During the same period, international remittances to Ghana alone stood at US $2100 million (World Bank, 2017). Over the last decade, the flow of internal remittances in Ghana has also been substantial due to north-south, rural-rural and rural-urban migration (Mensah-Bonsu, 2003;Twum-Baah et al., 1995), where migrants remit to their families they leave behind (Mazzucato et al., 2008). Not only does remittance provide direct financial support to households but it eases budget constraints of households by increasing the disposable income available for consumption and investment (Edwards & Ureta, 2003; McKenzie & Rapoport, 2006). This explains how remittance inflows increase households' ability to pay for children's education and enhance human capital development (Adams & Cuecuecha, 2010; Göbel, 2013; Lu & Treiman, 2007). This is also because poverty has been cited as being a barrier to children's education in sub–Saharan Africa (Roby et al., 2016).

Studies from Asia, Latin America and Europe have mainly supported the positive relationship between remittance inflow and child education. In Mexico, Córdova (2006) found that an increase in the fraction of households receiving remittances leads to a decrease in illiteracy and an increase in school attendance for children between 6 and 14 years old. Based on an income effect, Edwards and Ureta (2003) also found that remittance inflows lead to an increase in the number of hours Salvadorian children spend in school. While Yang (2008) found, after studying the 1997 Asian financial crisis, that an increase in the receipt of international remittances increased child schooling in the Philippines, Amuedo-orantes (2010) established that remittance income helps to neutralize the disruptive effect of household out-migration on children's educational attainment in the Dominican Republic. Lopez et al. (2007) also employed a two-step Heckman technique on data from 11 Latin American countries and found that remittances appeared to increase the educational attainment of children in some specific groups (considering the country, gender and urban dimensions).

Additionally, studies by Gorlich et al. (2007) and Matano and Ramos (2013) in Moldova; Nguyen and Nguyen (2015); Binci and Giannelli (2012) in Vietnam; and Mara et al. (2012) in Albania have all shown that a rise in migration and household remittance inflows can result in a boom in university education and educational status of children in general. In Jordan, Mansour and Chaaban (2011) have shown that remittance inflows have a positive effect on both educational attainment and attendance. Adams (2010) also conducted a study in Guatemala and found that remittance-receiving households spend more at the margin on education, than on consumption. Furthermore, he finds differential impacts by level of education. Remittance receiving households tend to allocate slightly more to preparatory and primary schooling, but at the secondary school level they allocate significantly more funds to education than non- remittance receiving households.

Just like other parts of the world, most research findings from Africa corroborate the positive effect of remittance inflows on child education. In Egypt, Elbadawy and Roushdy (2009) studied children from remittance-receiving households, while accounting for gender differences and different cohorts, and found that remittances have a positive effect on the school attendance of boys but less of an effect for girls. The effect was particularly strong among boys nearing university enrolment age while for girls; this was true only for those aged 15 to 17 years. Hines (2014) has also shown that the amount of remittances a household receives has a positive effect on the level of education expenditures in Kenyan households. In South Africa, Lu and Treiman (2007) found that flow of remittances into households substantially increase the likelihood that children will be in school, through increased household educational spending, reduced child labour, and mitigation of the negative effect of parental absence due to out-migration. This is similar to the finding from Mali, where Gubert (2007) has shown that remittance inflows alleviate poverty and encourage human capital formation.

Despite the myriad of evidence in support of the positive effect of remittance on child education, some researchers in different studies have shown how remittance inflows can also have a negative influence on children's educational attainment and outcomes in China, Bangladesh and Tajikistan (Zhu, 2016; Mim & Mabrouk, 2011; Kollner, 2013). In the Chinese case, it mainly affected children in the older age group. Some have

even argued that the absence of a migrant from the household may neutralise the positive effects of remittances on child education (Xu & Xie, 2015; McKenzie & Rapoport, 2011; Acosta, 2006). For instance, some children may need to take over family chores, or work in the family business due to the absence of a family member. These responsibilities may interfere with schooling even if the household has money to send the children to school (Amuedo-Dorantes et al., 2010).

In Ghana, many studies have been done on remittance and its influence on socioeconomic indicators (Kabki et al., 2004; Wong, 2006; Mazzucato, 2009; Mazzucato, 2011) but those focusing on the relationship between household remittance inflow and child education are quite limited. A study by Gyimah-Brempong and Asiedu (2015) has indicated that remittances significantly increase the probability that families enrol their children in primary and secondary schools, suggesting that remittances increase education and human capital formation. On the other hand, Adams and Cuecuecha (2013) found remittance receiving households in Ghana to be spending marginally less than their counterparts in non-remittance receiving households with similar income levels and other characteristics.

Deductions from the evidence above is that the extant literature on the remittance inflow-child education nexus have largely been undertaken in Asia and Latin American countries (Hanson & Woodruff, 2003; Edwards & Ureta, 2003; Arif, 2004; Acosta, 2006; Amuedo-Dorantes & Pozo, 2010; Sherpa, 2011; Chaaban & Mansour, 2012; Mara et al., 2012; Arif & Chaudhry, 2015). The studies from Ghana and other African countries have been limited (Elbadawy & Roushdy, 2009; Adams & Cuecuecha, 2013; Hines, 2014; Gyimah-Brempong & Asiedu, 2015; Pickbourn, 2016; Bouoiyour & Miftah, 2016) and have largely ignored children at the nursery and kindergarten levels. Apart from calling for an inclusion of children in nursery and kindergarten in child education studies, because these levels form part of the educational structure, these children are also potential beneficiaries of household remittance inflows. From birth to age six, the growth of mental and physical abilities of the child progress at an astounding rate and this lays the foundation for later school success.

In addition to the above-mentioned gap in empirical studies, these studies have largely ignored the fact that remittance may be endogenous (Acosta, 2007) and have less explored the gender and locational heterogeneities that may exist in the effect of remittance inflows on child

education. Over the years, reports on marginalisation and exclusion of girls have urged the international community to set targets for gender balance in all levels of education (Okkolin et al., 2010). Although Lopez et al. (2007) acknowledged that remittance may be endogenous and accounted for the gender and urban dimensions, they did not employ an instrumental variable (IV) approach but used a two-step Heckman strategy to assert causality. The Egyptian study by Elbadawy and Roushdy (2009) that also accounted for the gender differences and different cohorts did not account for the locational dimension and did not use an IV approach. It must also be noted that the above-mentioned studies did not include pre-primary school education in the remittance-child education relationship.

In the light of the above, we employ an IV strategy to explore the effect of household remittance inflows on child education by focusing on the school hours spent per week by children and further examine the gender (boys and girls) and locational dimensions. This study contributes to the extant literature in general and specific terms. Generally, it employs an instrumental variable strategy to resolve the endogeneity problem associated with remittance and explores both the gender and locational dimensions of the remittance-child education relationship. Specifically, we contribute to the relatively sparse literature from Africa that focuses on household remittance inflows and child education.

The rest of the paper is organized as follows. Section 2 discusses trends in household remittance inflows and children out of school as well as individual and family theories of remittances while section 3 describes our data and methodology. We tackle empirical analysis and discussion of results in section 4. Section 5 deals with the conclusion and recommendations.
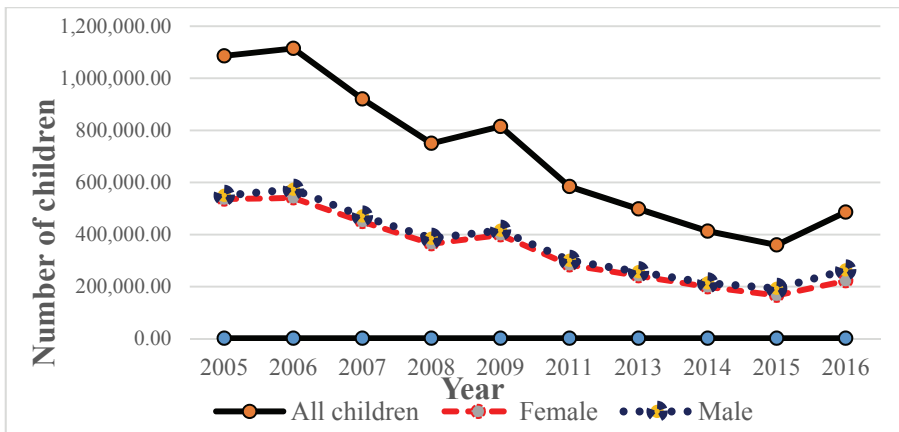
2 Trends in household remittance inflows and children out of school in Ghana

Remittance inflows into households (Figure 1) show a steady a slight increase from 2005 to 2010 and saw an upward trend from 2010 to 2015 but current figures indicate a downward movement.
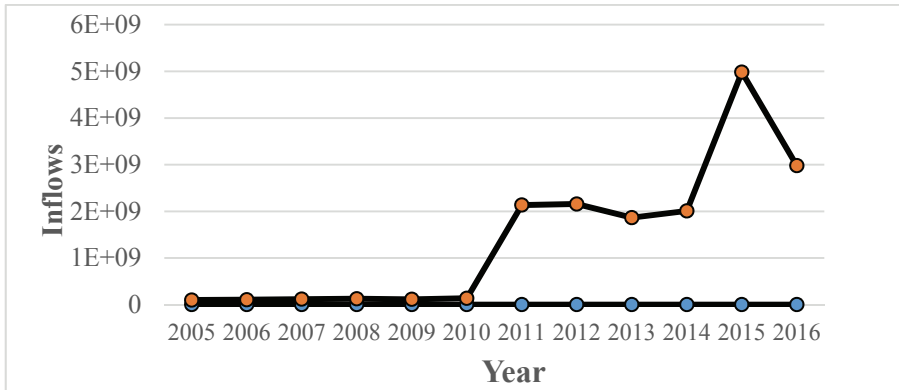
Figure 1. Household remittance inflows in Ghana (cash or in kind) (current US$)

Figure 2. Number of children not enrolled in primary or secondary school

Although some of the effects of such trends on household indicators have been documented, Figure 2 also shows that the total number of children not enrolled in primary and secondary schools have declined from 2005 to 2015 but only experienced an increase in 2016. Specifically, the increase in the number of males not enrolled is more than females. The dynamics of the trend in household remittance inflows and the child education is the motivation behind this study.

2.1 Individual and family theories of remittance

According to Bouoiyour and Miftah (2015), microeconomic studies have shown that socio-economic characteristics of migrants and recipient households affect the propensity to remit and receive remittances.

The economic literature on the motives of remittances has specifically discussed two types of theoretical models, namely, the individual and "family" models. At the individual level, altruism and self-interest are considered as drivers of remittances. According to the altruistic model, migrants remit because they are concerned about the consumption of their households back home. According to Lucas and Stark (1985) and Rapoport and Docquier (2006), the intention of migrant workers is to improve the welfare of their household members and friends back home by incorporating the utility of these people in their own utility. On the other hand, in the pure self-interest model, it is assumed that an individual strategy of transfer is chosen by the migrants. This model explains three reasons why migrants send remittances, namely: the intention to return to the hometown or country of origin, investment in the hometown or country of origin and the desire to inherit the assets of the family of origin (Lucas & Stark, 1985)

There is also the implicit intra-familial contract between the migrant on the one hand and the family on the other hand. In other words, there is a contractual agreement between the migrant and the family. This involves two models: the implicit contract of co-insurance and the implicit contract of loan repayment. The model of co-insurance contract implies that the family initially invests in the education and livelihood of the migrant and may finance the costs of his/her migration. When the migrant gets settled in the host town or country and starts working, he/she must support the family back home by transferring a portion of his/her savings. This new income will allow the household members back home to cope with possible shocks or hardships, such as sickness, unemployment, poor harvest and also pay for their children's education and undertake new projects. According to Azam and Gubert (2005), the household considers this co-insurance contract as a means to reduce its economic risks and to potentially increase its income. In some settings, the decision to remit money back home by the migrant in order to cover risks is explained by the personal risks incurred by the migrants in the host community

(Amuedo-Dorantes & Pozo, 2006).

On the other hand, the implicit family loan repayment contract ties migrants to their respective households. Households invest in their children's education and also bear the costs of their travel, and settlement in a town or country (Bouoiyour & Miftah, 2015). These migrants in turn, send remittances to their families to repay this implicit and informal loan when they begin to work and earn income.

Other motivations of remittances have been identified in the literature as the exchange of services. For example, the migrant parents send remittances to household members back home for caring for their children during their migration. Closely related to the exchange motive is the investment motive. In the investment motive, the migrants send remittances to their family back home which helps to take care of their investment during the period of migration (De La Brière et al., 1997; Poirine, 1997)

Even though the afore-mentioned motives are considered to be separate, and different from each other, they sometimes overlap. Thus, they are essentially all the same motive with the view to increasing the welfare of the sender and household members back home.

3 Data and methodology

3.1 Data

This study uses cross-sectional data obtained from the Ghana Living Standards Survey Round Six (GLSS 6). The GLSS 6 is a nationwide household survey that was carried out between 2012 and 2013 and designed to generate information on living conditions in Ghana. A total of 16,772 out of a sample of 18,000 households were successfully enumerated (Ghana Statistical Service [GSS], 2014) resulting in a 93.2% response rate. The GLSS 6 contains information on migration, remittance, employment and time use, housing conditions, health, education, household agriculture, expenditure and income and also covers household financial issues. According to the GLSS round 6 report, the annual estimated total value of remittances received by households amounted to GH¢1,804 million. The

report defines a child as a person aged less than 15 years at the time of the interview. In this study we focus on children aged 2 to 14 years. According to the GLSS 6 data, out of 16,722 households, 15,733 households have school children residing in them. After merging the various files containing the variables of interest, the number of households that reported their channels of receiving remittance was 4,832. This notwithstanding, the final sample after the regression analysis was 2,517 and this emanated from missing observations from other control variables that were accounted for in the model.

The regression process uses a square matrix, where missing observations result in deletion of entire rows and columns that encounter such missing observations. Nonetheless, this does not affect inferences drawn because the remaining sample size is large enough. It is representative of remittance-receiving households and provides an opportunity to analyse the remittance inflow- child education nexus and how a marginal improvement in remittance inflows influence child education.

3.1.1 Summary statistics

From the summary statistics in Table 1, it can be seen that average remittance inflows into households is GH¢532.88 (US$266.72)[2]. The receipt of remittances can relax the liquidity constraints faced by households and allow their children spend more time in school. The average household income without remittance is GH¢ 8779.46 (US$4394.34) while about seven people live in a household which can negatively affect child schooling because everyone in the household competes for the limited resource. The average age of children in the sample is 8.7 years while about 19.9% of household heads is without their spouse in the same home. In that case, the attention given to the child reduces and this, in turn, affects the total number of hours the child spends in school per week. Furthermore, it is indicated that about 42% of household heads are educated. It is expected that educated household heads will place a higher premium on their children's education. Finally, children spend an average of about 27 hours per week in school and this is because some of the children spend long hours in traffic before getting to school (an urban

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[2] Exchange rate is US$1= GH¢1.9979 — the exchange at the time of was data collection

phenomenon) and others do house chores before going to school.

Table 1. Summary statistics on the effect of remittance inflow on child education

Variable	Full Model		Urban		Rural	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Total remittance inflows	532.88	1669.84	904.71	2580.01	311.61	598.43
Rural (0=urban; 1=rural)	0.627	0.484	--	--	--	--
Household income (without remittance)	8779.46	13429.38	8531.87	12363.	8926.79	14026.82
Number of migrants	0.118	0.507	0.089	0.441	0.13	0.54
Absence of spouse	0.199	0.399	0.306	0.461	0.136	0.541
Household size	7.133	3.284	6.511	2.80	7.50	3.488
Age of household head	48.60	14.488	47.472	14.21	8.724	3.165
Female household head (1=female; 0=male)	0.196	0.397	0.289	0.453	0.14	0.347
Education of head (1=yes; 0=no)	0.451	0.498	0.594	0.491	0.364	0.481
Hours of child labour per week	11.495	24.35	7.669	19.140	13.773	26.723
Age of child	8.744	3.20	8.776	3.267	8.724	3.165
Female child (0=male; 1=female)	0.497	0.50	0.528	0.499	0.478	0.50
School hours spent per week	26.89	2.43	29.19	9.25	25.52	9.28

Source: Computed from GLSS 6, 2012/2013

3.2 Methodology

3.2.1 Empirical strategy - Instrumental variable estimation

We employ an instrumental variable strategy (IV) to specify our empirical model, acknowledging the potentially endogenous nature of remittance (Lopez et al., 2007). The identification strategy employed for the endogeneity in this study is premised on an omitted variable problem. The omitted variable here is the ability of the migrant which is missing in equation (1) but is correlated with the amount of remittance inflows and the child education (Bansak, Chezum & Giri, 2015). The intuition here is that, people with high academic ability have higher migration prospects (either internally or externally) and are likely to remit more to influence children's education. Since children are more likely to increase their hours spent in home production in the absence of migrants (Amuedo-Dorantes et al., 2010; Bansak et al., 2015), remittance inflows are expected to reduce

children's household labour allocation and increase their hours spent in school.

To resolve the endogeneity problem, we employed the "channel of receiving remittance" as an instrument because it satisfied the two general restrictions proposed by Jeffrey (2009) and Cameron and Trivedi (2010). The channel includes Western Union, MoneyGram, Vigo (Merchant Bank), Fast Money Transfer (GCB), bank accounts, post office, friends//relations, brought home by migrant and other means. First, the channel of receiving remittance is directly related to remittance inflow (Mazzucato, 2009; Sam et al., 2013) while it is uncorrelated with the number of hours children spend in school per week. A good instrument can eliminate the biases that arise from this endogeneity. We specify our structural and reduced form equations as follows:

Structural equation (2nd Stage)

$$hrs\_sch_i = \alpha_0 + \alpha_1 \ln rem_i + \alpha_2 rural_i + \alpha_3 \ln inc\_wt\_rem_i + \alpha_4 migrants_i + \alpha_5 abspouse_i \\ + \alpha_6 hhsize_i + \alpha_7 agehd_i + \alpha_8 femalehd_i + \alpha_9 edu_i + \alpha_{10} chdlabhrs_i + \alpha_{11} agechd_i + \\ \alpha_{12} femalechd_i + \varepsilon_i$$

$$(1)$$

Reduced form equation (1st stage)

$$\ln rem_i = \gamma_0 + \gamma_1 channel_i + \gamma_2 rural_i + \gamma_3 \ln inc\_wt\_rem_i + \gamma_4 migrants_i + \gamma_5 abspouse_i + \gamma_6 hhsize_i \\ + \gamma_7 agehd_i + \gamma_8 femalehd_i + \gamma_9 edu_i + \gamma_{10} chdlabhrs_i + \gamma_{11} agechd_i + \gamma_{12} femalechd_i + \upsilon_i$$

$$(2)$$

where hrs_sch is the number of hours children spend in school per week; $\ln rem$ is the log of total household remittance inflows; $channl$ represents the channel of receiving remittance; $rural$ is a dummy variable for location, where 0 is for urban and 1 is for rural; $linc\_wt\_rem$ is the log of household income without remittance; $migrants$ is number of out-migrants from the household; $abspouse$ represents a household with absent spouse; $hhsize$ is the household size; $agehd$ is the age of the household head; $femalehd$ is a gender dummy for the household head, where 0 is male and 1 is female; edu is a dummy variable indicating whether the household head is educated or not; $chdlabhrs$ is hours of child labour per week, $agechd$ is age of the child; and $femalechd$ refers to the gender of the child which is captured as 0 for male child and 1 for female

child. In addition to this model, sub-samples relating to the gender of the child and the location of the household are estimated.

3.2.2 Post-estimation tests

Endogeneity was tested using the Wu–Hausman test (p-value = 0.0115) which leads to a rejection of the null hypothesis that remittance inflow is exogenous. The weak identification test was also carried out to find out if the instrument has a weak correlation with the endogenous regressor. Since the Kleibergen-Paap Wald rk F statistic is 35.68 and exceeds the Stock-Yogo weak ID critical values at 10% maximal IV size, we reject the null hypothesis of weak instrument and conclude that the model does not have problems with weak identification. The link test for model specification also has the expectedly significant _hat and an insignificant _ hatsq which means that the model is correctly specified (see Table 2).

4 Results and discussion of results

Table 2 shows the results of the effect of remittance inflows on child education as estimated by OLS and IV strategies. Column 2 reports the OLS results, which does not control for any potential endogeneity. Based on the OLS estimate, a 40% increase in household remittance inflow results in about 8 minutes reduction in school hours per week (32 minutes per month).[3] Even though this result is highly significant, it is counter-intuitive and biased because of the presence of endogeneity. The IV estimator, on the contrary, yields intuitive results because an instrument is used to address the endogeneity in the model. The rest of the analysis and discussion are hinged on the IV estimates.

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[3] After dividing the coefficient of remittance by 100 (because it is log-transformed), we scaled both up by 40 and converted the outcome which is still in hours into minutes by multiplying by 60 minutes. For those in hours, we maintain them as they are.

Table 2. Results of the effect of remittances on child education

School hours per week	Full Model		Urban		Rural	
	OLS	IV	OLS	IV	OLS	IV
ln (total remittance inflows)	-0.330**	0.921*	0.233	2.309***	-0.687***	-0.428
	(0.138)	(0.530)	(0.197)	(0.695)	(0.193)	(0.657)
Rural (0=urban; 1=rural)	-3.138***	-2.422***	—	—	—	—
	(0.408)	(0.513)				
ln(Household income without remittance)	0.511***	0.456***	0.217	0.092	0.781***	0.765***
	(0.149)	(0.152)	(0.219)	(0.237)	(0.200)	(0.201)
Number of migrants	-0.079	-0.344	0.332	0.241	-0.325	-0.397
	(0.341)	(0.376)	(0.472)	(0.529)	(0.447)	(0.498)
Absence of spouse	-1.696*	-1.809**	-1.656	0.394	-1.212	-1.389
	(0.875)	(0.889)	(1.224)	(1.857)	(1.196)	(1.247)
Household size	-0.189***	-0.240***	0.038	0.017	-0.240***	-0.255***
	(0.068)	(0.073)	(0.133)	(0.137)	(0.077)	(0.084)
Age of household head	0.017	0.008	-0.029	-0.052**	0.036**	0.034**
	(0.013)	(0.014)	(0.022)	(0.024)	(0.016)	(0.016)
Female household head	1.790**	0.915	1.216	-2.431	1.497	1.452
	(0.894)	(0.991)	(1.291)	(1.932)	(1.182)	(1.180)
Education of head (1=yes; 0=no)	1.536***	1.004**	-0.232	-1.099	2.247***	2.548***
	(0.401)	(0.470)	(0.697)	(0.777)	(0.491)	(0.554)
Hours of child labour per week	-0.050***	-0.051***	-0.035	-0.013	-0.053***	-0.054***
	(0.010)	(0.010)	(0.027)	(0.028)	(0.011)	(0.011)
Age of child	0.200***	0.198***	0.021	0.030	0.324***	0.323***
	(0.058)	(0.059)	(0.092)	(0.097)	(0.074)	(0.074)
Female child	-0.162	-0.198	-0.178	-0.353	-0.101	-0.090
	(0.361)	(0.367)	(0.603)	(0.630)	(0.447)	(0.446)
Constant	26.511***	21.480***	26.582***	21.764***	17.932***	17.114***
	(2.016)	(2.881)	(3.067)	(3.440)	(2.480)	(3.213)
Sample Size (N)	2517	2517	939	939	1578	1578
R-squared	0.0828	0.0517	0.0119	0.0119	0.0985	0.0973
P-value– Link test		0.000				
_haqsq		0.122				
Endogeneity						
Wu–Hausman F (1,2503) =6.397		(p=0.0115)				
Weak identification						
F-Statistic (Staiger & Stock)		35.678				

Robust standard errors in parentheses

Source: Computed from GLSS 6, 2012/2013 *p<0.10 **p<0.05 ***p<0.01.
Instruments: *Channel of receiving remittance [Western Union, MoneyGram, Vigo (Merchant Bank), Fast Money Transfer (GCB, bank accounts, post office, friends/relations, brought home by migrant and other means]*

We also find that a 40% increase in remittances received by a household will also increase the time children spend in school per week by about 22 minutes (1.5 hours per month). This finding corroborates that of Amuedo-Dorantes et al. (2010) who found in some Haitian communities that remittances raise school attendance for all children regardless of whether they have household members abroad or not. Although education at the basic level is free in Ghana, families are often required to purchase uniforms, school materials and pay Parent Teacher Association (PTA) dues. Children without uniforms or PTA dues may have difficulties joining their colleagues in school. For some children, their homes or villages are located many miles away from their schools and so they need money to travel to and from school. Thus, remittance inflow to households would lead to an increase in the number of hours the child spends in school. In terms of the location of the household, a 40% increase in remittance inflow to urban-located households results in about 55 minutes (3 hours and 40 minutes) increase in the time children spend in school per week. This was not the case for their rural counterparts. The study by Edward and Ureta (2003) also revealed that remittance inflow to urban households increased the number of children attending school beyond Grade 6 by 50%. The point of departure between the two studies is that we employ an IV estimator to resolve the endogeneity inherent in remittance inflow into households.

Again, we find that children who reside in rural-located households (see full model from Table 2), spend an average of 2.4 hours per week less in school compared to their urban counterparts. In Ghana, schools in rural areas commonly face challenges such as poverty, geographic isolation, insufficient resources, and poor teacher quality in comparison with their urban counterparts. In addition, most of the children in the villages travel for long hours on daily basis just to access formal education in nearby villages or towns. Besides, some of the children have to help their parents at home before going to school every morning. All these account for the lesser number of hours that children in the rural areas spend in school.

We also establish that an increase in household income without remittance by 40% moderately increases children's time spent in school per week by 11 minutes. This confirms the expectation that household income without remittance has a part to play in determining the number of hours children spend in school. This result is consistent with that of

Kalaj (2010) who found a positive effect of household income on child education in Albania. The income effect is significant in the rural area but not in the urban area and in the cities. The urban outcome is partly explained by the homogenous nature of school hours spent by children in the cities and big towns.

Children from homes that have absent spouses spend an average of 1.8 hours less time in school per week than their mates who come from homes with spouses being present. Saucedo (2006) also found similar outcomes in Mexico, where children living with both parents were seen to have had greater opportunities to focus on schooling. Thus, children living with both parents have a greater chance of spending more hours in school than those whose parent(s) are absent.

Again, our findings indicate that household size has a negative influence on child education and is seen as being more of a rural phenomenon than an urban situation. Adding another member to a rural household means more people now compete for the limited financial resources and children suffer a reduction in their school hours per week. It could also be explained in the form of increase in the number of dependents on the child's time need, warranting sacrifices in school hours per week. Similar revelations can be found in Shen's (2017) study that showed that limiting family size has beneficial consequence for child education in China. Furthermore, an increase in the age of urban-located household heads results in a decrease in their children's number of hours spent in school per week but a similar increase in the age of their rural counterpart rather increases the number of hours their children spend in school per week.

On the average, children from the homes of educated household heads spend an average of one hour in school per week more than children whose household heads are not educated. The differential effect from the educational status of the household head is mainly manifest in the rural areas and not the urban areas.

According to UNICEF (2008), child labour is one of the obstacles in the way of the Millennium Development Goal of universal primary education. The number of hours a child works outside school can affect child schooling. Our study establishes that increase in child labour hours leads to a reduction in the number of hours these children spend in school per week and the problem is more apparent in the rural areas of the country. This supports the findings of Gunnarsson et al. (2006) who indicated that

child work has the potential to harm a child's school outcomes by limiting the time spent on studies, or leaving the child too tired to make efficient use of the time in school. Similarly, children's age positively influences the number of hours they spend in school. Our finding can be aligned with that of Olaniyan's (2011) Nigerian study which provides evidence that the older a child becomes, the higher the probability of attending school.

4.1 Gender perspective of remittances and child education

The policies of many governments have generally aimed at closing the gender disparities in education. In spite of this effort, the gender differences in educational participation have remained a challenging issue in many countries including Ghana. The purpose of this section is to present separate results that capture gender heterogeneity in the effect of remittance inflows on child education in Ghana.

Results for the gender heterogeneities show that while increases in remittance inflows have a positive influence on boy-child education, it does not explain girl-child education. This result suggests that the gains in school hours from remittances are much greater for boys and do not make any or more of a difference in improving that of the girls. Our finding supports that of Elbadawy and Roushdy (2009) who found that households remittance inflows improved school attendance for boys but was less of an effect for girls. Again, while all children in rural-located households spend less time in school compared to their urban mates, the rural disadvantage affects the girl child more than the boy-child.

Again, an increase in the household size reduces school hours for children but the effect on male children is greater than that of female children. Also, children from homes where the heads are educated spend relatively more time in school but this significantly influences the number of hours the girl-child spends in school per week and not for the boy-child.

Finally, we find that the negative effect of child labour on children's time spent in school per week affects male children more than their female counterparts. Also, the positive influence of children's age on their duration in school is seen as being more for girls than for boys. This can also be explained from the angle of girls becoming more conscious of their education as they grow older than boys do. For boys, Ghanaian society is

Table 3. Results of the effect of child gender on child education

School hours per week	Gender			
	Male		Female	
	OLS	IV	OLS	IV
ln (total remittance inflows)	-0.100 (0.195)	2.645*** (0.839)	-0.560*** (0.198)	-0.283 (0.670)
Rural (0=urban; 1=rural)	-3.067*** (0.570)	-1.720** (0.759)	-3.274*** (0.587)	-3.120*** (0.721)
ln(Household income without remittance)	0.393* (0.213)	0.235 (0.235)	0.614*** (0.211)	0.619*** (0.212)
Number of migrants	-0.524 (0.510)	-1.168*** (0.590)	0.462 (0.402)	0.407 (0.529)
Absence of spouse	-01.511 (1.352)	-1.8211 (1.437)	-1.840 (1.135)	-1.854 (1.130)
Household size	-0.238** (0.104)	-0.368*** (0.120)	-0.143 (0.88)	-0.151* (0.090)
Age of household head	0.008 (0.019)	-0.006 (0.021)	0.024 (0.018)	0.021 (0.019)
Female household head	0.974 (1.408)	-1.126 (1.640)	2.455** (1.130)	2.260 (1.218)
Education of head (1=yes; 0=no)	1.694*** (0.563)	0.559 (0.719)	1.393** (0.577)	1.278* (0.655)
Hours of child labour per week	-0.043*** (0.014)	-0.047*** (0.015)	-0.058*** (0.015)	-0.059*** (0.015)
Age of child	0.179** (0.084)	0.172* (0.092)	0.223*** (0.080)	0.228*** (0.080)

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Constant	27.823***	17.712***	25.144***	23.904***
	(2.886)	(4.283)	(2.734)	(3.922)
Sample Size	1268	1268	1252	1252
R-squared	0.235	0.223	0.246	0.235
P-value– Link test	0.000			
_haqsq	0.122			
Endogeneity				
Wu–Hausman F (1,2503) =6.397	(pr=0.0115)			
Weak identification				
F-Statistic (Staiger & Stock)	35.678			

Robust standard errors in parentheses

Source: Computed from GLSS 6, 2012/2013 *p<0.10 **p<0.05 ***p<0.01.

Instruments: *Channel of receiving remittance [Western Union, MoneyGram, Vigo (Merchant Bank), Fast Money Transfer (GCB), bank accounts, post office, friends/relations, brought home by migrant and other means]*

structured to make them go through and stay in school as compared to girls. However, as girls grow older they tend to stay in school more than boys.

5 Conclusion and policy recommendations

Household remittance inflows are becoming an indispensable part of the household budget in the developing world (including Ghana) and a number of studies have been done to determine the effect of such inflows on key socioeconomic indicators including child education. Apart from many of these studies being largely undertaken in Asia and Latin America, with relatively few from Africa, the endogenous nature of remittance has been downplayed. Also, previous studies have largely ignored children in nursery and kindergarten levels when considering child education. We employ an instrumental variable approach to investigate the effect of household remittance inflows on the number of hours children spend in school and include children in nursery and kindergarten in our consideration of child education.

After employing the channel of receiving remittance as an instrument to address the endogeneity inherent in remittance inflow and estimation sub-sampled models to cater for gender and locational heterogeneities, our findings show the following:

- Generally, increasing household remittance inflow by 40% will result in about 22 minutes increase in the time children spend in school per week, translating into about 1.5 hours per month. In the urban areas, the resultant increase is about 55 minutes per week (3 hours and 40 minutes per month) but remittance did not significantly affect school hours of the rural–located children.
- Although increases in remittance inflows positively influence boy-child education, it does not explain girl–child education. This result suggests that the gains in school hours from remittances are much greater for boys and do not make any or more of a difference in improving that of the girls.
- While all children in rural–located households spend less time in

school (2.4 hours less) per week compared to their urban mates, the rural disadvantage affects the girl child more than the boy–child.

· The negative effect of child labour on children's time spent in school per week affects male children more than their female counterparts.

· Children from homes of educated household heads spend an average of one hour in school per week more than colleagues from homes of uneducated heads. The differential effect from the educational status of the household head is mainly manifest in the rural areas and not the urban areas.

Our central finding is that household remittance inflows play instrumental roles in augmenting households' and government efforts at educating children and for this reason, regulators of the financial system should develop strategic sectorial policies that address all challenges facing remittance transfers. This will remove rigidities and ensure continuity and regularity of remittance inflows to the household.

References

Acosta, P, "Labour supply, school attendance, and remittances from international migration: The case of El Salvador." The World Bank, 2006.

Acosta, P, "Entrepreneurship, labor markets, and international remittances: Evidence from El Salvador." *International Migration, Economic Development and Policy, Özden and Schiff Eds*, 2007.

Adams Jr, R. H. and A. Cuecuecha, "Remittances, household expenditure and investment in Guatemala." *World Development*, 38(11), 2010, 1626–1641.

Adams Jr, R. H. and A. Cuecuecha, "The impact of remittances on investment and poverty in Ghana." *World Development*, 50, 2013, 24–40.

Amuedo-Dorantes, C., Georges, A. and S. Pozo, "Migration, remittances, and children's schooling in Haiti." *The ANNALS of the American Academy of Political and Social Science*, 630(1), 2010, 224–244.

Amuedo-Dorantes, C. and S. Pozo, "Remittances as insurance: evidence from Mexican immigrants." *Journal of Population Economics*, 19(2), 2006,

227–254.

Amuedo-Dorantes, C. and S. Pozo, "Accounting for remittance and migration effects on children's schooling." *World Development*, *38*(12), 2010, 1747–1759.

Arif, G. M,. "Effects of overseas migration on household consumption, education, health and labour supply in Pakistan." International Labour Migration from South Asia, Institute of Developing Economies and Japan External Trade Organization, Chiba, Japa, 2004.

Arif, R. and A. Chaudhry, "The effects of external migration on enrolments, accumulated schooling and dropouts in Punjab." *Applied Economics*, *47*(16), 2015, 1607–1632.

Azam, J.-P. and F. Gubert, "Migrant remittances and economic development in Africa: A review of evidence." *AERC Plenary Session, Nairobi, Kenya*, 2005.

Binci, M. and G.C. Giannelli, G. C., "Internal vs. international migration: Impacts of remittances on child well-being in Vietnam." *IZA Discussion Paper* 6523 2012.

Bansak, C., Chezum, B. and A. Giri, "Remittances, school quality, and household education expenditures in Nepal." *IZA Journal of Migration*, *4*(1), 2015, 16.

Bouoiyour, J. and A. Miftah, "Why do migrants remit? Testing hypotheses for the case of Morocco," *IZA Journal of Migration*, *4*(1), 2015, 2.

Bouoiyour, J. and A. Miftah, "The Impact of Remittances on Children's Human Capital Accumulation: Evidence from Morocco." *Journal of International Development*, *28*(2), 2016, 266–280.

Cameron, C. C. and P. K. Trivedi, "Nonlinear regression methods. *Microeconomics Using Stata.*" 2010, 319–362.

Chaaban, J. and W. Mansour, "The impact of remittances on education in Jordan, Syria and Lebanon." In Economic Research Forum: Working Paper Vol. 684, 2012.

Córdova, J. E. L., "Globalization, migration and development: The role of Mexican migrant remittances," (Working Paper ITD= Documento de Trabajo ITD; n. 20) (Vol. 20), BID-INTAL, 2006.

De La Brière, B., de Janvry, A., Lambert, S. and E. Sadoulet, "Why do migrants remit? An analysis for the Dominican Sierra." No.

583-2016-39540. 1997. .

Edwards, A. C. and M. Ureta, "International migration, remittances, and schooling: Evidence from El Salvador." *Journal of Development Economics*, 72(2), 2003, 429–461.

Elbadawy, A. and R. Roushdy, "Impact of international migration and remittances on child schooling and child work: The case of Egypt." Population Council Working Papers 454 2009.

Giorguli Saucedo, S. E., Lezama, J. L. and J.B. Morelos, "School dropout rates, adolescent labor and family structures in Mexico." *Population, City and Environment in Contemporary Mexico. El Colegio de México, México, DF*, 2006, 223–257.

Göbel, K., "Remittances, expenditure patterns, and gender: parametric and semiparametric evidence from Ecuador." *IZA Journal of Migration*, 2(1), 2013, 1.

Görlich, D., Omar Mahmoud, T. and C. Trebesch,. "Explaining labour market inactivity in migrant-sending families: Housework, hammock, or higher education?" No. 1391, Kiel Working Paper, 2007.

Gubert, F., "Migration and Development: Mixed evidence from western Mali." *Development*, 50(4), 2007, 94–100.

Gunnarsson, V., Orazem, P. F. and M. A. Sánchez, "Child labor and school achievement in Latin America." *The World Bank Economic Review*, 20(1), 2006, 31–54.

Gyimah-Brempong, K. and E. Asiedu, "Remittances and investment in education: Evidence from Ghana." *The Journal of International Trade & Economic Development*, 24(2), 2015, 173–200.

Hanson, G. H. and C. Woodruff, "*Emigration and educational attainment in Mexico.*" Mimeo., University of California at San Diego, 2003.

Hines, A., "Migration, remittances and human capital investment in Kenya." *Economic Notes: Review of Banking, Finance and Monetary Economics*, 2014.

Jeffrey, M. W.. *Introductory Econometrics: A modern approach*. Canada: South-Western Cengage Learning, 2009.

Kabki, M., Mazzucato, V. and E. Appiah, "'Wo benane a ɛyɛ bebree': the economic impact of remittances of Netherlands-based Ghanaian migrants on rural Ashanti." *Population, Space and Place*, 10(2), 2004,

85–97.

Kalaj, E. H., "Remittances and human capital investment: Evidence from Albania." *Available at SSRN 2285641*, 2010.

Köllner, S., "Remittances and educational attainment: Evidence from Tajikistan." Wirtschaftswissenschaftliche Beiträge des Lehrstuhls für Volkswirtschaftslehre, insbes. Wirtschaftsordnung und Sozialpolitik, Universität Würzburg, 2013.

Lopez J.H, Fajnzylber P. and P. Acosta, "The impact of remittances on poverty and human capital: evidence from Latin American household surveys." The World Bank; 2007.

Lu, Y. and D. J. Treiman, "The effect of labor migration and remittances on children's education among blacks in South Africa." *California Center for Population Research*. 2007.

Lucas, R. E. and O. Stark, "Motivations to remit: Evidence from Botswana." *Journal of Political Economy*, *93*(5), 1985, 901–918.

Mansour, W, Chaaban, J. and J. Litchfield, "The impact of migrant remittances on school attendance and education attainment: Evidence from Jordan." *International Migration Review*, *45*(4), 2011, 812–851.

Mara, I, Narazani, E., Saban, N, Stojilovska, A., Yusufi, I. and S. Zuber, "Analysis of literature on the effects of remittances on education and health of family members left behind." *International Migration and Development* 31, 2012, 511-523.

Matano, A. and R. Ramos, "Remittances and educational outcomes: Evidence for Moldova." SEARCH Working Paper WP3/10, 2013.

Mazzucato, V., "Informal insurance arrangements in Ghanaian migrants' transnational networks: The role of reverse remittances and geographic proximity." *World Development*, *37*(6), 2009, 1105–1115.

Mazzucato, V., "Reverse remittances in the migration–development nexus: Two-way flows between Ghana and the Netherlands." *Population, Space and Place*, *17*(5), 2011, 454–468.

Mazzucato, V., Van Den Boom, B. and N. N. Nsowah-Nuamah, Remittances in Ghana: Origin, destination and issues of measurement. *International Migration*, *46*(1), 2008, 103–122.

McKenzie, D. and H. Rapoport, "Can migration reduce educational attainment? Evidence from Mexico." The World Bank, 2006.

Mensah-Bonsu, A., "Migration and environmental pressure in northern Ghana." 2003.

Milligan, M. A., "The welfare effects of international remittance income." (PhD Thesis). The University of New Mexico, 2009.

Mim, S. B. and F. Mabrouk, "Remittances and economic growth: What channels of transmission?(In French). Groupe de Recherche en Economie Théorique et Appliquée, 2011.

Nguyen, C. V. and H.Q. Nguyen, "Do internal and international remittances matter to health, education and labor of children and adolescents? The case of Vietnam." *Children and Youth Services Review*, *58*, 2015, 28–34.

Okkolin, M. A., Lehtomäki, E. and E. Bhalalusesa, "The successful education sector development in Tanzania–comment on gender balance and inclusive education." *Gender and Education*, *22*(1), 2010, 63-71.

Olaniyan, O., "The determinants of child schooling in Nigeria. *African Economic Research Consortium*, 2011.

Pickbourn, L., "Remittances and Household Expenditures on Education in Ghana's Northern Region: Why Gender Matters." *Feminist Economics*, *22*(3), 2016, 74–100.

Poirine, B., "A theory of remittances as an implicit family loan arrangement." *World Development*, *25*(4), 1997, 589–611.

Rapoport, H. and F. Docquier, *The economics of migrants' remittances*. Handbook of the economics of giving, altruism and reciprocity 2, 2006, 1135-1198.

Roby, J. L., Erickson, L. and C. Nagaishi, "Education for children in sub-Saharan Africa: Predictors impacting school attendance." *Children and Youth Services Review*, *64*, 2016, 110–116.

Sam, G. A., Boateng, F. O., and P. K. Oppong-Boakye, "Remittances from abroad: The Ghanaian household perspective." *International Journal of Business and Social Science*, *4*(1), 2013.

Shen, Y., "The effect of family size on children's education: Evidence from the fertility control policy in China." *Frontiers of Economics in China*, *12*(1), 2017, 37.

Sherpa, M., "Essays on determinants of human capital accumulation." 2011.

Siegel, M., and M. Lücke, "What determines the choice of transfer channel for migrant remittances? The case of Moldova." Kiel working paper, No.

1515, 2009.

Twum-Baah, K. A., Nabila, J. S., and A. F. Aryee, "Migration Research in Ghana, Volume 1, Internal Migration." *Accra: Ghana Statistical Service.* 1995.

UNICEF, "A world fit for children." New York: United Nations Children's Fund, 2008.

Wong, M., "The gendered politics of remittances in Ghanaian transnational families." *Economic Geography, 82*(4), 2006, 355–381.

Xu, H. and Y. Xie. "The causal effects of rural-to-urban migration on children's well-being in China." *European sociological review* 31, no. 4, 2015, 502-519.

Yang, D., "International migration, remittances and household investment: Evidence from Philippine migrants' exchange rate shocks." *The Economic Journal, 118*(528), 2008, 591–630.

Zhu, H., "Remittance frequency, transaction fees and household impacts." No. 333-2016-14588. 2016.

World Bank, "World Development Indicators." Washington DC: The World Bank Group, 2018.

Appendix: First stage regression used for the IV model

Lnremit	Coefficient
Channels of receiving remittances	
Moneygram	0.414
	(0.264)
Vigo merchant bank	-1.50***
	(0.115)
Fast money transfer (GCB)	-0.985
	(0.184)
Bank accounts	-0.411**
	(0.174)
Post office	-0.299
	(0.183)
Friends/relations	-0.922***
	(0.114)
Brought home by migrant	-1.187***
	(0.120)
0ther	-0.709***
	(0.162)
Rural (Urban=0, Rural=1)	-0.350***
	(0.065)
Female household head (Male=0, female=1)	0.638***
	(0.209)
Age of household head	0.006**
	(0.002)
Household size	0.016
	(0.012)
ln(household income without remittances)	0.011
	(0.028)
Number of migrants	0.320***
	(0.058)
Absence of spouse	0.108
	(0.221)
Hours of child labour per week	-0.001
	(0.001)
Age of child	0.005
	(0.010)
Female child	-0.101
	(0.062)
Education of head (yes=1, No=0)	0.306***
	(0.065)
Constant	5.089***
	(0.40)
Robust standard errors in parentheses	

Source: Computed from GLSS 6, 2012/2013. *p<0.10 **p<0.05 ***p<0.01.