

The Impact of Remittances on Children's Education in Bangladesh

Shamil M. Al-Islam^a, Fayeeka Simanna Prachee^b and Md. Khaled Saifullah^c

Abstract: *Inward remittance is one of the major sources of foreign income for Bangladesh and its economic significance at both macro and household levels is evident in the existing literature. This study assesses the impact of remittances on school enrolment of children in Bangladesh by utilising cross-sectional household-level data obtained from the Household Income and Expenditure Survey 2016. Employing a probit regression method for the analysis, our findings reveal a positive relationship between school enrolment of children and remittances as expected. Furthermore, the education levels of parents are found to have a significant positive impact on the school enrolment of children. Our results also suggest that households with two or three children are more likely to enrol their children in schools as opposed to households with just one child and those with four or more children. However, household location (urban) and gender of children (male) exhibit a negative impact on enrolment. This study suggests that along with the current incentives provided to migrant workers sending remittances, the government can also implement modified or additional incentives to enhance the enrolment of children from remittance-receiving families. Also, to address the issues of lower enrolment among children from urban areas, male children and households with just one child, policymakers should develop new intervention programmes while sensitising the public on the benefits of acquiring education.*

Keywords: Remittances; Children's education; Bangladesh.

JEL Classification: F22, F24, J61

^a Department of Economics, School of Business and Entrepreneurship, Independent University, Bangladesh, Dhaka, Bangladesh. *E-mail:* shamil@iub.edu.bd.

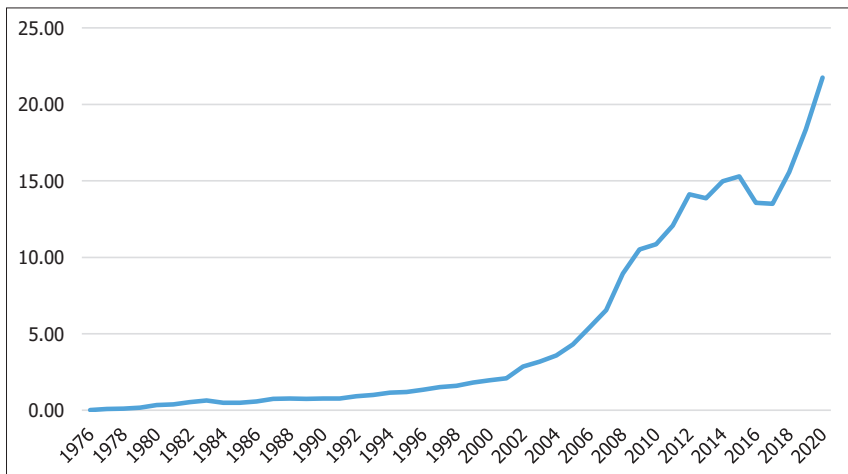
^b Department of Geography & Environmental Management, rm. EV1-330, Faculty of Independent Researcher, Dhaka, Bangladesh. *E-mail:* fayeeka.prachee@gmail.com.

^c Corresponding author. Department of Economics, School of Business and Entrepreneurship, Independent University, Bangladesh, Dhaka, Bangladesh. *E-mail:* khaled@iub.edu.bd, Orcid ID: 0000-0002-3881-5665.

1. Introduction

Over the years increased globalisation has eased access to global labour markets, thereby promoting the migration of people from developing countries to developed economies for better job opportunities. In 2020, 10 million Bangladeshis were officially recorded as foreign workers, contributing significant remittances to the country (Khan & Sultana, 2020). According to Haven et al. (2019), Bangladesh has been growing over the years, with major contributions emerging from inward remittances. In addition, remittance is the second-largest source of foreign currency earnings for the country. According to the World Bank (2021), the inward remittance of Bangladesh has expanded by 18.46% from 2019 to reach \$21.75 billion in 2020, as shown in Figure 1. Over the last two decades, remittance has contributed as much as 35% to the total export earnings (Ali, 2014). Also, this inflow of income contributes to the recipient households' overall income, which in turn has a positive impact on their consumption, health and education status (Calero, Bedi & Sparrow, 2009; Nguyen & Nguyen, 2015).

Figure 1: Remittances to Bangladesh, 1976-2020 (in USD billion)



Source: World Bank (2021).

Numerous studies have argued that the growth of a country is closely linked to its education level (Sanders & Barth, 1968; Hanushek & Wößmann, 2010; Ramirez, 2014). The economic effects of investment in education are naturally a subject of interest among economists and policymakers, especially in developing countries. McClelland (1966), and Sanders and Barth (1968) have observed, from a historical perspective, that the development of a country's healthcare system is dependent on having well-educated and trained healthcare personnel. Similarly, without a skilled labour force, well-equipped industries were reported to operate under suboptimal conditions. These underscores the importance of education in improving the skills of the nation's population and creating a more competitive labour force for the country's development. Education at primary and secondary levels is essential to infuse young people with the necessary skills for the labour market (McClelland, 1966; Sanders & Barth, 1968). Accordingly, policymakers in Bangladesh have given education the utmost priority. Even during the outbreak of the COVID-19 pandemic, when schools are shut down, the government arranged a daily educational TV broadcast titled 'Learning at Home' to fill the learning void (Ministry of Finance, 2021). The net enrolment at the primary school was about 97.81% in 2020 (Ministry of Finance, 2021), while the net enrolment at the secondary school was 65.55% in 2018 (World Bank, 2021). For the policymakers to develop effective measures to improve the current school enrolment, it is of utmost importance to understand the different factors that affect households' decisions on their children's school enrolment.

Many studies at the household level have observed the impact of remittances on education in developing countries such as Nepal (Bansak et al., 2015), Pakistan (Khan & Khan, 2016), Jordan and Syria (Chaaban & Mansour, 2012), Mexico (Hanson & Woodruff, 2003), Bolivia (Coon, 2016), Ecuador (Bucheli et al., 2018) and Indonesia (Basrowi, 2019). These studies concluded that remittances have a significant positive impact on education, especially for poorer households. Additionally, Bouoiyour and Miftah (2015) found in their study in Morocco that remittance has a positive effect on the school enrolment of children (particularly the boys) in rural areas. According to Kumar et al. (2018), remittances relax the liquidity and budget constraints of the recipient households, thus enhancing their consumption, health and education status (Calero et al., 2009; Nguyen & Nguyen, 2015).

Islam (2011) highlighted that remittances play a significant role in

reducing the poverty level and improving socio-economic development in Bangladesh. The majority of the Bangladeshi migrant workers who migrated abroad are unskilled and also from poor households in rural areas. The remittance of these migrant workers plays a significant role in poverty alleviation, as it lightens the budget constraints of their households, thus allowing them to increase their consumption and invest in health and education (Islam, 2011). Although Tiza et al. (2019) demonstrated that remittances have a positive impact on years of schooling and tertiary education in Bangladesh, Kumar (2019) discovered otherwise. Both the studies by Kumar (2019), as well as Tiza et al. (2019) are limited, as they are based on a small sample size (396 and 100, respectively) and only covered one (Comilla and Tangail, respectively) of 64 districts in Bangladesh.

Among the top 10 countries that produce migrant workers, four are from South Asia, with Bangladesh ranking second in South Asia and sixth globally (IOM, 2020). In terms of remittance-receiving countries, Bangladesh ranked eighth globally and third in South Asia (World Bank, 2021). In 2020, the emittance inflow of Bangladesh amounts to 6.7% of its Gross Domestic Product (GDP) (World Bank, 2021). As there are very limited comprehensive studies on the impact of remittances on education in Bangladesh, this study makes a significant contribution to the literature. Specifically, this study aims to assess the impact of remittances on the school enrolment of children at the household level in Bangladesh by utilising nationwide data collected through the Household Income and Expenditure Survey (HIES).

2. Literature Review

Remittances can be defined as money or goods transferred by migrant workers from abroad to their country of origin (Adams & Cuecuecha, 2010). According to the World Bank (2021), remittance contributed 6.7% to GDP in 2020 and is the second-highest source of foreign exchange earnings for Bangladesh. The migration of workers overseas partly mitigates the problem of unemployment in the country (Wadood & Hossain, 2017). Besides the economic contributions, studies have also found that remittance improves the consumption, education and health status of households (Adams & Page, 2005; Kumar et al., 2018), as well as reduces poverty at the household level (Adams & Cuecuecha, 2013; Ratha, 2013). Kanaiaupuni and Donato (1999), as well as Adams and Cuecuecha (2010) argued that remittances supplement

the income of poor households and are deemed as key sources of funds for health care and education expenditure.

Existing literature on the effects of remittances on education shows mixed results of both positive and negative impacts. However, one of the major factors constraining the growth of education is poverty, and remittance has been proven to reduce poverty and increase private consumption at the micro-level (Ahmed et al., 2010; Islam, 2011). Moreover, households that receive remittances have an additional source of finance, which promotes their investment in their children's education (Suh, 2016). Likewise, Chaaban and Mansour (2012) also found that the increased income as a result of remittance inflow enhances the livelihood of recipient households and affords them the ability to invest in capital accumulation and education. Furthermore, lower credit constraints of remittance-receiving households encourage the re-enrolment of their out-of-school children.

A positive relationship has been observed between remittances and school participation of children belonging to remittance-receiving households in Mexico, with higher education increasing these children's chances of migrating in the future (McKenzie & Rapoport, 2011; Chaaban & Mansour, 2012). Coon (2016) found that remittances reduce child labour as well as decreases the working hours of children in rural areas; meanwhile, in the urban areas, remittance completely halts children's involvement in the workforce, thus increasing their school participation. This is because the opportunity cost associated with sending children to work for extra income instead of school has been offset by the remittances received from migrant members. According to a study in the Dominican Republic, remittances were observed to encourage children's secondary-level education (Amuedo-Dorantes & Pozo, 2010). On the contrary, the negative effects of international remittances have been observed in a recent study in Bangladesh, indicating that the per-capita expenditure on education may be reduced by BDT 1020.67 if households receive international remittances (Kumar, 2019). A study in Tajikistan also found a negative influence of remittances on the left-behind children of migrants, with school enrolment reducing by 10 to 14% (Cortes, 2015). Stark and Byra (2012) argued that the migration of unskilled workers might negatively impact the schooling of their children, as it would lead them to the false hope of employment without obtaining educational credentials. Khan and Khan (2016) also observed that children of remittance-receiving households exhibit lower participation in, or

completion of, tertiary-level education, as the opportunity cost of education increases when they reach an age where they are old enough to join the labour force.

Khan and Khan (2016) argued that parental education is also an important factor in determining children's schooling since school enrolment decisions are usually taken by the parents. Educated parents are more likely to value the importance of education. Khan and Khan (2016) and Nasir et al. (2011) found that the absence of a parent or guardian hinders the children's participation in school due to the lack of supervision and possibly increased social responsibilities left behind by the migrating household member. Moreover, the children have the tendency to be distracted from studies due to a lack of supervision and guidance from parents. Likewise, Mboya and Nesengani (1999) also found that a father's absence due to migration has a detrimental effect on the education of the left-behind children. Furthermore, Nasir et al. (2011) revealed that a larger family size reduces the absenteeism effect, which is beneficial for the education of children, as the other members also play a role in the supervision and guidance of the children.

The effect of gender and regional inequalities has been investigated by Bucheli et al. (2018), who observed that remittances positively impact the education of boys and urban children as opposed to girls and rural children in Ecuador. In contrast, Khan and Khan (2016) found the impact of remittances on girls' school enrolment to be 13% higher than boys in Pakistan. It was also discovered that the enrolment of children from remittance-receiving households is 34% greater than children from non-receiving households. In terms of the household income level, Bucheli et al. (2018) found that children from low-income households have better education enrolment due to remittance inflow, which supposedly relaxes the households' budget constraint. However, remittance was not observed to generate a significant influence on the school enrolment of children belonging to households with higher incomes.

A study conducted by Arif et al. (2019) in Bangladesh, China, Egypt, India, Mexico, Nigeria, Pakistan and the Philippines reported that the inflow of remittance plays a significant role in education development. A similar study was conducted by Zaman et al. (2021) utilising data from the same eight countries, and their findings revealed that remittances positively impact the education expenditure of the household. Furthermore, Azizi (2018) examined 122 developing countries from sub-Saharan Africa, South

Asia, East Asia and the Pacific, Europe and Central Asia, Middle East and North Africa, and Latin America and the Caribbean. The study demonstrated that remittances raise public and private school enrolment for pre-primary, primary and secondary schools in developing countries. The study also argued that remittances increase the school completion rate and improve girls' education outcomes more than boys. Although remittances do not exhibit a significant impact on school enrolment in Indonesia (Moestopo, 2020) and Egypt (Ayad & El-Aziz, 2018), it significantly influences educational attainment at the university level.

3. Methodology

This study uses cross-sectional data from the HIES 2016,¹ which was carried out by the Bangladesh Bureau of Statistics (BBS). The HIES is one of the key activities of the BBS and is conducted every five years and contains extensive information on several socio-economic variables at the household level. The survey contains nine sections, among which this paper has only selected the key variables that are relevant for this study, namely remittances, education, household characteristics and expenditure. These sections contain information about whether the household has a migrant member and receives remittances or not, the total amount of remittances received in the last two years, education levels of the non-migrant members in the household, their occupation, age, gender, marital status, number of children in the household and geographic location of the household. Based on the survey, the dataset includes a total of 186,078 observations from 46,080 households, with 130,436 and 55,642 observations belonging to rural and urban households. These households are spread across 2,304 Primary Sampling Units (PSUs) at the district level. The PSUs were arrived at by dividing each of the 64 districts within the eight divisions of the country into sub-categories of smaller geographical areas. By selecting 20 households within each PSU for interviews, a dataset comprising 186,078 observations from 46,080 households was generated.

The following probit model (see Table 1 for the definition of the variables) was used to deduce the impacts of remittances on primary and secondary school enrolment of children within the age group of 5-18 years:²

$$CS = \beta_0 + \beta_1 RS + \beta_2 FED + \beta_3 MED + \beta_4 NC + \beta_5 RE + \beta_6 GC + \beta_7 ME + \beta_8 AG + \mu \quad (1)$$

Table 1: Definitions of Variables and Expected Signs

Variable abbreviation	Variable definition	Expected sign
CS	Child school enrolment (dependent variable)	
RS	Remittance status	+/-
FED	Father's education level	+
MED	Mother's education level	+
NC	Number of children in the household who belong to our selected age group (5-18 years)	-
RE	Region (urban/rural)	+/-
GC	Gender of the child (male/female)	+
ME	Log of monthly non-food expenditure of the household	+
AG	Age group (primary) of child	+
μ	Error term	

Source: Authors' compilation based on literature review.

Since this research aims to explore how remittances affect households' school enrolment of their children, remittances was taken as one of the independent variables used in this model. Following Baluch and Shahid (2008), et al. (2011), Cortes (2015), Khan and Khan (2016), and Siddiqui (2017), father and mother's education level were included as the explanatory variables in the model, as educated parents tend to value the education of their children more than the uneducated parents.

The monthly expenditure of the household determines whether the household can afford to send their children to school. The monthly non-food expenditure was used as a proxy variable for the household's income, in line with past studies (Baker, 2018; Dhanarajet al., 2018; Awwad et al., 2021). Moreover, the monthly non-food expenditure can reflect the propensity of the households to purchase items other than the basic necessities, such as food (Ahmed et al., 2010; Islam, 2011; Nguyen & Nguyen, 2015; Kumar et al., 2018).

The number of children within the households was used as another independent variable, as households with a greater number of children will have higher expenses, which will affect their schooling decisions. A larger number of school-going children reduces the per capita expenditure for any given income level of the household; therefore, this variable has been included in the model as a control variable. To keep the model relatively simple, special or additional expenditure on other adults in the household was assumed to have no significant impact on the dependent variable and thus excluded from the model; medical expenditure or other special expenditures were assumed to be purely random and specific to a household.

Remittances, gender and region were used as dummy variables; where, RS = 1 if the household receives remittance, otherwise 0 (i.e., non-recipient households); GC = 1 if the child is male; and RE = 1 if the household is located in an urban area. The region variable was used to capture the regional disparities between urban and rural households (Baluch & Shahid, 2008; Bucheli et al., 2018), and the gender variable was utilised to capture the gender disparities between male and female children (Baluch & Shahid, 2008; Khan & Khan, 2016). The variable (number of children) was divided into four categories to examine the specific impacts of remittances on the enrolment of children from households with two or more children compared to households with just one child; the number of school-going children plays a significant role in enrolling children to the school (Maitra, 2003).

The age group of children (5 to 18 years) was selected for this research and considered as a dummy variable. In this regard, AG = 1 if the children are aged between 5 and 11 years (primary school age-group), otherwise 0 (i.e., they belong to secondary and higher secondary school age-group of 12 to 18 years) (Chowdhury & Sarkar, 2018). This was done to observe the difference in enrolment pattern between children of primary school-going age and children of secondary and higher secondary school-going age.

This study used the probit model to estimate the equation. In this case, the dependent variable (CS) is a function of X (independent variables) and a binary variable, and CS = 1 if the child is currently enrolled in school, otherwise 0. The regression function was modelled using the cumulative distribution function, Φ , if:

$$ME(CS|X) = P(CS=1|X) = \Phi(\beta_0 + \beta_1 X)$$

$\beta_0 + \beta_1 X$ performs the function of the quantile, z .

$$\Phi(z) = P(Z \leq z), Z \sim N(0, 1)$$

From equation 1,

$$P(\text{CS}=1|\text{RS, FED, MED, NC, RE, GC, ME, AG}) = \Phi(\beta_0 + \beta_1 \text{RS} + \beta_2 \text{FED} + \beta_3 \text{MED} + \beta_4 \text{NC} + \beta_5 \text{RE} + \beta_6 \text{GC} + \beta_7 \text{ME} + \beta_8 \text{AG}) \quad (2)$$

Given the multiple regressors (independent variables), the predicted probability that $Y = 1$ can be calculated by computing

$$z = \beta_0 + \beta_1 \text{RS} + \beta_2 \text{FED} + \beta_3 \text{MED} + \beta_4 \text{NC} + \beta_5 \text{RE} + \beta_6 \text{AG} + \beta_7 \text{ME} + \beta_8 \text{AG}$$

The coefficient β_n shows the effect of a one-unit change in the independent variable X_n on z , assuming all the other regressors remain constant (Hanck et al., 2019). Marginal effects were further calculated as an additional step in order to interpret the coefficients of the probit model, which allows the display of the average percentage change in the conditional probability of the dependent variable due to a one-unit change (1% for expenditure, since it is log transformed) in one of the regressors.

4. Findings and Discussion

4.1 Descriptive statistics analysis

The HIES 2016 dataset includes a total of 186,078 households, of which 70% and 30% are from rural and urban areas, respectively (Table 2). Table 2 also shows that, out of the total households, 56,142 households have at least a child aged between 5 and 18 years. Among them, 72% live in rural areas and the remaining in urban areas. The objective of the paper is to assess the relationship between remittance, parents' education and child schooling. Hence, this study considers only households with children of school-going age (5 to 18 years). Table 2 also indicates that only 10% of the households receive remittance, while the rest (90%) do not.

Table 2: Socio-Demographic Characteristics of Households

Measure	Item	Frequency	Percentage
Region	Rural	130,436	70
	Age 5-18	40,185	31
	Above 18	90,251	69
	Urban	55,642	30
	Age 5-18	15,957	29
	Above 18	39,685	71
	Total	186,078	
Remittances	Non-recipient	167,651	90
	Recipient	18,427	10
	Total	186,078	

Source: BBS (2016).

Table 3 shows that the majority (26%) of the selected households were from the Dhaka division, while the least (8%) were from the Sylhet division. However, in terms of the households from the rural areas, the majority were from Rajshahi, Dhaka and Chattogram divisions.

Table 3: Division Distribution of Selected Households

Division	Region	Frequency	Percentage	Total Frequency	Total Percentage
Barisal	Rural	4127	7%	5369	10
	Urban	1242	2%		
Chattogram	Rural	9157	16%	11507	20
	Urban	2351	4%		
Dhaka	Rural	9143	16%	14579	26
	Urban	5436	10%		
Khulna	Rural	4681	8%	7268	13
	Urban	2587	5%		
Rajshahi	Rural	9529	17%	12649	23
	Urban	3120	6%		
Sylhet	Rural	3588	6%	4770	8
	Urban	1182	2%		

Source: BBS (2016).

According to Table 4, 39% of the selected households have two children aged between 5 and 18 years, 28% have three children and 16% have only one child.

Table 4: Number of Children Per Household (5 to 18 years)

Number of children	Frequency	Percentage
1	9,094	16
2	22,156	39
3	15,625	28
4 and above	9,267	17

Source: BBS (2016).

Table 5 shows that 80% and 84% of children (5 to 18 years) belonging to non-remittance recipient households and remittance-recipient households, respectively are enrolled in either primary or secondary school. The table also shows that 205 of the children are not enrolled in school during the survey.

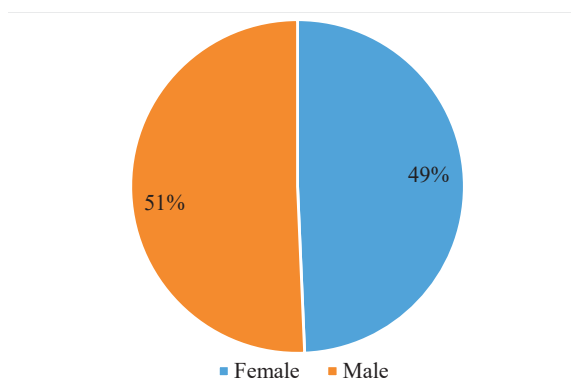
Table 5: School Enrolment of Children (5 to 18 years), based on Remittance Status

Remittance	Enrolled in school (Frequency)		Enrolled in school (%)	
	Yes	No	Yes	No
Non-recipient	40,073	10,046	80	20
Recipient	5,064	959	84	16
Total	45,137	11,005	80	20

Source: BBS (2016).

Figure 2 shows that among the school-enrolled children, 51% are male and 49% are female. Moreover, out of the 56,142 households' children enrolled in school, about 51% and 49% of the households have male and female children, respectively, indicating that school enrolment was higher among male children.

Figure 2: School Enrolment by Gender



Source: BBS (2016).

4.2 Spearman's correlation

Table 6 shows the results of Spearman's correlation among variables. As a rule of thumb for Spearman's correlation, the coefficient should be greater than zero and less than 0.8 to negate the counterfeit effect of multicollinearity; smaller values of Spearman's correlation mean less multicollinearity problems with the variables (Spearman, 1987; Hauke & Kossowski, 2011; Field, 2013; Baskar et al., 2021). Most of the correlation values were positive, indicating positive relationships. On the contrary, a negative value denotes a negative relationship. The highest Spearman's correlation value was 0.550 for the correlation between MED and FED, and the lowest Spearman's correlation value was -0.001 for the correlation between AG and GC. Hence, the results revealed that there are no multicollinearity issues among the variables.

Table 6: Spearman's Correlation Result Among Variables

	CS	RS	FED	MED	RE	GC	ME	AG
CS	1.000							
RS	.035**	1.000						
FED	.150**	-.120**	1.000					
MED	.209**	.040**	.550**	1.000				
RE	-.010*	-.063**	.156**	.154**	1.000			
GC	-.051**	-0.008	-.015**	-.024**	-.015**	1.000		
ME	.110**	.171**	.260**	.262**	.223**	-.023**	1.000	
AG	0.004	0.008	-.009*	-0.007	-0.003	-0.001	0.002	1.000

Notes : ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Source: Authors'.

4.3 *Probit regression analysis*

Table 7 shows the result of the probit regression model. The sample size of the Probit regression model is 56,142 households with at least a child aged between 5 and 18 years. The chi² test confirms the overall significance of the model, that the null hypothesis of explanatory variables is jointly 0 cannot be accepted. The estimated coefficients in the probit model above are better interpreted with an additional step, where the marginal effects of the regressors are measured. The marginal effect (Table 8) interprets how much the conditional probability of the dependent variable changes when there is a change in the value of a regressor.

Table 7: Result of Probit Regression

Variables	Coef.	Z	P
RS	0.0919	4.15	0.000*
FED	0.0182	9.11	0.000*
MED	0.0487	22.22	0.000*
RE	-0.1691	-11.5	0.000*
GC	-0.1294	-10.1	0.000*
Log_ME	0.2127	22.8	0.000*
AG	0.7085	53.2	0.000*
NC_2	0.2062	12.83	0.000*
NC_3	0.0605	3.31	0.001*
NC_4_&_above	-0.1569	-6.88	0.000*
C	-1.4417	-18.73	0.000*
LR $\chi^2(10)$ = 6102.14			
Prob > χ^2 = 0.0000			

Note: * Significant at less than 1%.

Table 8: Marginal Effects from Regression Results (Model VCE: OIM)

Variables	dy/dx	Z	P> z
RS	0.0230	4.15	0.000*
FED	0.0045	9.12	0.000*
MED	0.0122	22.41	0.000*
RE	-0.0423	-11.53	0.000*
GC	-0.0323	-10.12	0.000*
Log_ME	0.0532	23.03	0.000*
AG	0.1771	56.18	0.000*
NC_2	0.0515	12.88	0.000*
NC_3	0.0151	3.32	0.001*
NC_4_&_above	-0.0392	-6.88	0.000*

Note: * Significant at less than 1%.

The independent variable (remittance) has a positive coefficient, indicating that households' receipt of remittance increases the probability of their children's school enrolment. A one-unit increase in remittance increases the probability of the household enrolling their child in school by 2.3%. The result is in agreement with the findings in the existing literature (Khan & Khan, 2016; Suh, 2016). In contrast to Stark and Byra's (2012) findings, the results show a positive relationship for Bangladesh, as the contribution of education is supposed to translate into improved quality of human capital, a factor that could have a sustainable positive economic impact in the long run. The positive coefficients of the variables father and mother's education indicate their positive relationship with the school enrolment of a child. In other words, the probability of sending a child to school increases when the father and mother's education level are higher. This result supports the claims from the existing literature that the education levels of parents play a significant role in the education of their children (Chaaban & Mansour, 2012; Siddiqui, 2017).

The monthly non-food expenditure of the household was taken as a proxy for household's disposable income, an increase in which raises their ability to invest in goods after consumption of basic needs. From this test result, it can be inferred that the probability of sending a child to school increases by 5.31% as a result of a one-unit increase in their monthly expenditure. The variable, region, was found to have a negative coefficient, which shows that the probability of enrolment is lower for children from urban areas compared to rural areas. This result is contradictory to the findings by Bucheli et al. (2018), and the plausible reason, in the context of Bangladesh, could be that more job opportunities are available in urban areas, which increases the opportunity cost of continuing education.

Gender has a negative coefficient, which indicates that the probability of male children enrolling in school is lower than their female counterparts. This contradicts the findings in the existing literature, which suggests that male children have higher school enrolment than female children due to the pervasive gender discrimination in this part of the world (Mansuri, 2006). This observation could be because the government of Bangladesh generally provides incentives such as tuition fee waivers and food to female students at the primary and secondary levels, which encourages people to send girls to school. The age dummy shows a positive coefficient, suggesting that the likelihood of an increase in school enrolment is higher for children who are

aged between 5 and 11 years compared to those in the age range 12 to 18 years. This could be attributed to the fact that older children are often sent to work, which reduces their chance of continuing education. Moreover, the incentives provided at secondary level to all genders are relatively lower. In contrast, the Primary Education Stipend Program (PESP) provides BDT 100 per month to eligible poor households with primary school-going children on the condition of their enrolment, attendance, persistence and performance (Gelb et al., 2019).

The dummies for the number of children show that if a household has two or three children of school-going age, the probability of sending the children to school is 5.15%, compared to those households with just one child, which is just 1.15%. The low probability recorded for parents with only one child could be due to their overprotectiveness of their only child or due to their inclination to have greater savings as a cushion for the child in the future, thus making school enrolment of the only child less appealing. The effects of households having four or more children is negative on enrolment, which could reasonably be attributed to higher expenditure associated with more family members when compared to households with just one child.

5. Conclusion

The paper assesses the role of remittances in determining the school enrolment of children at the household level in Bangladesh. This study utilises the 2016 data of HIES in Bangladesh and employs Probit regression model for analysis. Results from Probit regression suggest that there is a positive relationship between child school enrolment and remittances. Furthermore, the analysis also shows that the father's and mother's education levels significantly contribute toward child school enrolment. On the other hand, this study found negative relationships between child school enrolment and households with four or more children, households located in urban areas and male children. Since Bangladesh ranks third among the top-three neighbouring remittance-recipient countries (India and Pakistan are the other two) from South Asia (World Bank, 2021) with close cultural ties and similar socioeconomic conditions, the findings of this paper conform to findings of existing literature and can be useful in the context of South Asian countries at large.

In recent times, the government of Bangladesh has introduced a 2% incentive on remittances sent by migrant workers (Bangladesh Bank, 2021), and even though primary education is free at public schools for all and up to higher secondary level for girls, the policymakers can consider redesigning or incorporating this incentive scheme into the education of children. This could ensure better enrolment outcomes among children, given that financial constraint is identified as one of the main reasons for school dropout in the existing literature. Taking into account the lower probability of enrolment among households with one child, male children and children from urban areas, the policymakers could also consider new intervention programs besides renewal and revamping of existing campaigns to promote awareness of the benefits of acquiring education—how education could contribute towards skill development and increase productivity and earning potential of both domestic and migrant workforce.

While this study focuses on current enrolment, further studies can look into the role of remittances on the attainment of education across time and education levels. Further studies can include more control variables such as scholarship programmes, and different government interventions, provided data is available in the future.

References

- Adams, R.H.J., & Cuecuecha, A. (2010). Remittances, household expenditure and investment in Guatemala. *World Development*, 38(11), 1626-1641. DOI: 10.1016/j.worlddev.2010.03.003
- Adams, R.H.J., & Cuecuecha, A. (2013). The impact of remittances on investment and poverty in Ghana. *World Development*, 50, 24-40. DOI: 10.1016/j.worlddev.2013.04.009
- Adams, R. H., and Page, J. (2005). Do international migration and remittances reduce poverty in developing countries?. *World Development*, 33(10), 1645-1669. DOI: 10.1016/j.worlddev.2005.05.004
- Ahmed, V., Sugiyarto, G., & Jha, S. (2010). Remittances and household welfare: A case study of Pakistan. Economics Working Paper No. 194. Asian Development Bank, Manila. <http://hdl.handle.net/11540/1536>
- Ali, M.A. (2014). Socio-economic impact of foreign remittance in Bangladesh. *Global Journal of Management and Business Research*, 14(5), 45-54. Retrieved from: <https://globaljournals.org/item/3897-socio-economic-impact-of-foreign-remittance-in-bangladesh>

- Amuedo-Dorantes, C., & Pozo, S. (2010). Accounting for remittance and migration effects on children's schooling. *World Development*, 38(12), 1747-1759. DOI: 10.1016/j.worlddev.2010.05.008
- Arif, I., Raza, S.A., Friemann, A., & Suleman, M. T. (2019). The role of remittances in the development of higher education: Evidence from top remittance receiving countries. *Social Indicators Research*, 141(3), 1233-1243. DOI: 10.1007/s11205-018-1857-8
- Awwad, F.A., Abdel-Rahman, S., & Abonazel, M.R. (2021). Estimating equivalence scales and non-food needs in Egypt: Parametric and semiparametric regression modeling. *Plos One*, 16(8), e0256017. DOI: 10.1371/journal.pone.0256017
- Ayad, M.S., & El-Aziz, A. (2018). The Impact of remittances on children's educational attainment: evidence from Egypt. *Socio Economic Challenges*, 2(2), 49-59. DOI: 10.21272/sec.2(2).49-59.2018
- Azizi, S. (2018). The impacts of workers' remittances on human capital and labor supply in developing countries. *Economic Modelling*, 75, 377-396. DOI: 10.1016/j.econmod.2018.07.011
- Baker, S.R. (2018). Debt and the response to household income shocks: Validation and application of linked financial account data. *Journal of Political Economy*, 126(4), 1504-1557. DOI: 10.1086/698106
- Baluch, M.U.H., & Shahid, S. (2008). Determinants of enrollment in primary education: a case study of district Lahore. *Pakistan Economic and Social Review*, 161-200. <http://www.jstor.org/stable/25825334>
- Bangladesh Bank. (2021). Quarterly Report on Remittance Inflows in Bangladesh: January – March 2021. External Economics Division. Bangladesh Bank, Dhaka. Retrieved from: <https://www.bb.org.bd/>
- Bansak, C., Chezum, B., & Giri, A. (2015). Remittances, school quality, and household education expenditures in Nepal. *IZA Journal of Migration*, 4(1), 1-19. DOI: 10.1186/s40176-015-0041-z
- Baskar, S., Dhulipala, V.S., Shakeel, P.M., Sridhar, K.P., & Kumar, R. (2020). Hybrid fuzzy based spearman rank correlation for cranial nerve palsy detection in MIoT environment. *Health and Technology*, 10(1), 259-270. DOI: 10.1007/s12553-019-00294-8
- Basrowi, B. (2019). Impact of migrant workers to the family economic status, educational level, and child health. *Journal of Research in Educational Sciences*, 10(12), 18-23. DOI: 10.14505/jres.v10.12.03

- BBS. (2017). Household Income and Expenditure Survey 2016-2017. Bangladesh Bureau of Statistics (BBS). Dhaka. Retrieved from: <http://data.bbs.gov.bd/index.php/catalog/182>
- Bouoiyour, J., & Miftah, A. (2015). The impact of migrant workers' remittances on the living standards of families in Morocco: A propensity score matching approach. *Migration Letters*, 12(1), 13-27. DOI: 10.33182/ml.v12i1.253
- Bucheli, J.R., Bohara, A.K., & Fontenla, M. (2018). Mixed effects of remittances on child education. *IZA Journal of Development and Migration*, 8(1), 1-18. DOI: 10.1186/s40176-017-0118-y
- Calero, C., Bedi, A. S., & Sparrow, R. (2009). Remittances, liquidity constraints and human capital investments in Ecuador. *World Development*, 37(6), 1143-1154. DOI: 10.1016/j.worlddev.2008.10.006
- Chaaban, J., & Mansour, W. (2012). The impact of remittances on education in Jordan, Syria and Lebanon. Working Paper No. 684, Economic Research Forum, Giza. Retrieved from: <https://erf.org.eg/publications/impact-remittances-education-jordan-syria-lebanon/>
- Chowdhury, R., & Sarkar, M. (2018). Education in Bangladesh: Changing contexts and emerging realities. In Chowdhury, R., Sarkar, M., Mojumder, F. & Moninoor Roshid, M. (Eds.), *Engaging in Educational Research: Revisiting Policy and Practice in Bangladesh* (pp. 1-18). Springer, Singapore. DOI: 10.1007/978-981-13-0708-9_1
- Coon, M. (2016). Remittances and child labor in Bolivia. *IZA Journal of Migration*, 5(1), 1-26. DOI: 10.1186/s40176-016-0050-6
- Cortes, P. (2015). The feminization of international migration and its effects on the children left behind: Evidence from the Philippines. *World Development*, 65, 62-78. DOI: 10.1016/j.worlddev.2013.10.021
- Dhanaraj, S., Mahambare, V., & Munjal, P. (2018). From income to household welfare: lessons from refrigerator ownership in India. *Journal of Quantitative Economics*, 16(2), 573-588. DOI: 10.1007/s40953-017-0084-5
- Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics* (4th ed.). Sage: London.
- Gelb, A., Mukherjee, A., Navis, K., Akter, M., & Naima, J. (2019). Primary education stipends in Bangladesh: Do mothers prefer digital payments over cash? Center for Global Development, Washington DC. Retrieved

- from: <https://www.cgdev.org/sites/default/files/primary-education-stipends-bangladesh-do-mothers-prefer-digital-payments-over-cash.pdf>
- Hanck, C., Arnold, M., Gerber, A., & Schmelzer, M. (2019). *Introduction to Econometrics with R*. University of Duisburg-Essen: Essen.
- Hanson, G. H., & Woodruff, C. (2003). Emigration and educational attainment in Mexico. University of California at San Diego. San Diego, California. Retrieved from: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.716.5969&rep=rep1&type=pdf#:~:text=The%20preliminary%20findings%20are%20that,parents%20have%20low%20education%20levels>.
- Hanushek, E.A., & Wößmann, L. (2010). Education and economic growth. In Peterson, P., Baker, E., McGaw, B. (Eds.), *International Encyclopedia of Education*, 2, 245-252. Oxford: Elsevier.
- Hauke, J., & Kossowski, T. (2011). Comparison of values of Pearson's and Spearman's correlation coefficients on the same sets of data. *Quaestiones Geographicae*, 30(2), 87-93. DOI: 10.2478/v10117-011-0021-1
- Haven, B.J., Khan, N.S., Hussain, Z., Alam, A., & Shahriar, S. (2019). Bangladesh Development Update October 2019: Tertiary Education and Job Skills (No. 142479, pp. 1-47). World Bank, Washington DC. <http://hdl.handle.net/10986/32533>
- IOM. (2020). World Migration Report 2020. International Organization for Migration (IOM), Geneva. Retrieved from: https://publications.iom.int/system/files/pdf/wmr_2020.pdf
- Islam, M.N. (2011). Bangladesh Expatriate Workers and their Contribution to National Development. Bureau of Manpower Employment and Training, Ministry of Manpower Development and Social Welfare, Dhaka. Retrieved from: http://bmet.gov.bd/sites/default/files/files/bmet.portal.gov.bd/publications/dba48f71_bd1d_4a73_9f7f_de16ef801ad1/Remittance%20and%20its%20impact.pdf
- Kanaiaupuni, S. M., & Donato, K. M. (1999). Migrant dollars and mortality: The effects of migration on infant survival in Mexico. *Demography*, 36(3), 339-353. DOI: 10.2307/2648057
- Khan, A., & Sultana, M. (2020). International migration literature search in Bangladesh during the period of 1971-2020. *International Research Journal of Business and Social Science*, 6(4), 1-24. DOI: 10.2139/ssrn.3866504

- Khan, S.U., & Khan, M.J. (2016). The impact of remittances on child education in Pakistan. *The Lahore Journal of Economics*, 21(1), 69-98. DOI: 10.35536/lje.2016.v21.i1.a3
- Kumar, B. (2019). The impact of international remittances on education and health in Bangladesh. *International Journal of Science and Qualitative Analysis*, 5(1), 6-14. DOI: 10.11648/j.ijsqa.20190501.12
- Kumar, B., Hossain, M.E., & Osmani, M.A.G. (2018). Utilization of international remittances in Bangladesh. *Remittances Review*, 3(1), 5-18. DOI: 10.33182/rr.v3i1.424
- Kumar, R.R., Stauvermann, P.J., Kumar, N.N., & Shahzad, S.J.H. (2018). Revisiting the threshold effect of remittances on total factor productivity growth in South Asia: a study of Bangladesh and India. *Applied Economics*, 50(26), 2860-2877. DOI: 10.1080/00036846.2017.1412074
- Maitra, P. (2003). Schooling and educational attainment: Evidence from Bangladesh. *Education Economics*, 11(2), 129-153, DOI: 10.1080/09645290210131665
- Mansuri, G. (2006). Migration, school attainment, and child labor: evidence from rural Pakistan. World Bank Policy Research Working Paper no. 3945. World Bank, Washington DC. <http://hdl.handle.net/10986/8422>
- Mboya, M.M., & Nesengani, R.I. (1999). Migrant labor in South Africa: A comparative analysis of the academic achievement of father-present and father-absent adolescents. *Adolescence*, 34(136), 763-767. <https://pubmed.ncbi.nlm.nih.gov/10730701/>
- McClelland, D.C. (1966). Does education accelerate economic growth?. *Economic Development and Cultural Change*, 14(3), 257-278. DOI: 10.1086/450163
- McKenzie, D., & Rapoport, H. (2011). Can migration reduce educational attainment? Evidence from Mexico. *Journal of Population Economics*, 24(4), 1331-1358. DOI: 10.1007/s00148-010-0316-x
- Ministry of Finance. (2021). Bangladesh Economic Review 2021. Finance Division, Ministry of Finance, Bangladesh, Dhaka. <https://mof.portal.gov.bd/site/page/28ba57f5-59ff-4426-970a-bf014242179e/Bangladesh-Economic-Review>
- Moestopo, H.J. (2020). Migrant worker cash transfer effect on children education. *Educational Research and Reviews*, 15(4), 167-174. DOI: 10.5897/ERR2020.3943

- Nasir, M., Tariq, M. S., & Rehman, F. U. (2011). The effect of foreign remittances on schooling: Evidence from Pakistan. PIDE Working Papers 2011:66, Pakistan Institute of Development Economics, Islamabad. <https://ideas.repec.org/p/pid/wpaper/201166.html>
- Nguyen, C.V., & Nguyen, H.Q. (2015). 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, 28-34. DOI: 10.1016/j.childyouth.2015.09.002
- Ramirez, M.M. (2014). Economic Growth and Education Reform in Developing Countries. All Graduate Plan B and other Reports 384. Utah State University, Utah. Retrieved from: <https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1380&context=gradreports>
- Ratha, D. (2013). The impact of remittances on economic growth and poverty reduction. Migration Policy Institute, Policy Brief, No. 8, Washington, D.C. Retrieved from: <https://www.migrationpolicy.org/pubs/Remittances-PovertyReduction.pdf>
- Sanders, D.P., & Barth, P.S. (1968). Chapter II: Education and Economic Development. *Review of Educational Research*, 38(3), 213-230. DOI: 10.3102/00346543038003213
- Siddiqui, N. (2017). Parental education as a determinant of school choice: A comparative study of school types in Pakistan. *Research in Education*, 99(1), 3-18. DOI: 10.1177/0034523717725862
- Spearman, C. (1987). The proof and measurement of association between two things. *The American Journal of Psychology*, 100(3/4), 441-471. DOI: 10.2307/1422689
- Stark, O., & Byra, L. (2012). A back-door brain drain. *Economics Letters*, 116(3), 273-276. DOI: 10.1016/j.econlet.2012.03.002
- Suh, A.D. (2016). Remittances impact on girl's education: a critical review. Department of Political Science, Lund University, Lund. Retrieved from: <https://lup.lub.lu.se/student-papers/record/8873358/file/8890517.pdf>
- World Bank. (2021). *World Bank Open Data*. Retrieved from: <https://data.worldbank.org/>
- Tiza, F.T., Farid, K.S., & Mozumdar, L. (2019). Impact of remittances on educational attainment of the migrant households: A micro level study. *The Bangladesh Journal of Agricultural Economics*, 40(1&2), 57-68. DOI: 10.22004/ag.econ.304094

- Wadood, S.N., & Hossain, A. (2017). Microeconomic impact of remittances on household welfare: Evidences from Bangladesh. *Business and Economic Horizons (BEH)*, 13(1), 10-29. DOI: 10.15208/beh.2017.02
- Zaman, S., Wang, Z., & Zaman, Q.U. (2021). Exploring the relationship between remittances received, education expenditures, energy use, income, poverty, and economic growth: fresh empirical evidence in the context of selected remittances receiving countries. *Environmental Science and Pollution Research*, 28(14), 17865-17877. DOI: 10.1007/s11356-020-11943-1