Impact of Remittances on Human Capital Development of Children in Indonesian Household

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Abstract

We examine the effect of remittances on education in Indonesian household using the Indonesian Family Life Survey. The study controls for various family characteristics and endogeniety problems using IV estimation. The results indicate that remittances increase the likelihood that a child remains in school by 23 percent. Using the IV estimation by controlling for the child- and household characteristics, the estimate is now large and significant statistically. We also examined whether remittances also lead to other outcomes such as whether a child is working while attending school, whether the child repeats grades, and whether the child experiences school disruption. We do not find evidence that remittances improve a child's performances in terms of grade repetition or reduces the likelihood that he/she experience school disruption. Although remittances increase the school attendance of children, the above results indicate that quality of schooling for the children does not increase from the remittances. This indicates that the trade-off of parents leaving the household and working overseas tends to have negative impact on the human capital accumulation of the child.

Keywords: *Remittances, Migrant household, Schooling*

JEL classification: D64, D82, F22

1 Introduction

Recent evidence suggests that international migration could play an important role in poverty alleviation and improving the living standards of poor in developing countries. In particular, the migrant remittances are important part of foreign currency flows to many countries and it augments the domestic household consumption and investments. In 2006, remittances to developing countries are nearly US$ 206 billion, doubled from that in 2001 (IMF Balance of Payment Statistics Yearbook, 2007).[2] International Fund for Agricultural Development (IFAD) suggests that remittances are an important source of fund to meet immediate needs of the migrants' families in home countries, to save, and to invest in education and health. Remittances may also play an important role in poverty reduction and spurring economic growth in developing countries (IFAD, 2007a).

Buch, Kuckulenz and Manchec (2002), for example, estimate that the average remittances to developing countries during the 1990s are US$ 81 billion per year. In the recipient countries, remittances have become an important source of capital that could augment domestic investment. In countries like Indonesia and the Philippines, for example, the amount of remittances is even larger than the revenues of some of the region's local governments.

Several cross-sectional studies highlight the positive impact of remittances on education and health in developing countries, thereby promoting economic development in the domestic economy (Adams and Page, 2005; Ratna, 2006, Adams, 2005). Recent empirical evidence suggest using survey level data of Guatemala indicates that households receiving either internal

[2] According to IFAD (2007b), globally, Asia and Oceania region is the largest recipient of remittances with nearly US$ 113 billion annually, which is around 38% of the global remittances in 2006. Within Asia, migrant remittances account for nearly 13.1% of GDP for Bangladesh, 2.7% India, 14.1% Nepal, 4.8% Pakistan, 12.7% Sri Lanka, 1.1% Indonesia, 12.5% Philippines, 1.2% Thailand, 1.6% Malaysia and 11.2% Vietnam.

or international remittances spend more on investment goods, education and housing, as compared to those households without remittances (Adams and Cuecuecha, 2010).

In contrast, some researchers argue that migration has little impact on the well-being of the households as remittances are merely substitutes for household income; they are not sufficiently large to better the households' well-being and to speed up economic development. Recent surveys suggest that migrants incur huge transaction cost to go abroad, and the wages that the migrants obtain merely compensate them to live at subsistence level (Chami, Fullenkamp and Jahjah, 2005; Rodriguez and Tiongson, 2001; Funkhouser, 1992). In the study of remittances on the Indonesian economy using household level data, Parinduri and Thangavelu (2010) also found little evidence of the impact of remittances on the investment of education and health.

In this paper, we study the impact of remittances on the investment of education of children in Indonesia using household level data using the using Indonesia Family Life Survey (IFLS), a household survey in Indonesia. We use an IV estimation to identify the effect of remittances on school attendance as well as other outcomes.

Several recent studies highlight the importance of investment on education from remittances of family members in alleviating poverty and improving the standard of living of poor families. Cross-sectional empirical evidence from Pakistan and El Salvador indicates that remittances reduced child labour and promote school retention (Cox and Ureta, 2003; Acosta, 2006; Mansuri, 2006; Acosta, Fajnzylber and López, 2007). Using household panel data from Philippines, Yang (2008) also show a positive impact of remittances on educational investment.

However, the impact of remittances on schooling is inconclusive. For instance, in the study of remittances in Mexico, remittances tend to have little impact in rural communities and less educated mothers (Hanson and Woodruff, 2003; Borraz, 2005; Boucher, Stark, and Taylor,

2005). Some studies highlight negative impact of migration on schooling in terms of lack of proper guidance and supervision of children as key family member leaves the household and send remittances back (Hanson Woodruff, 2003; López Córdoba, 2005; McKenzie and Rapoport, 2010). Recent study on Nepal by Banzak and Chezum (2008) tends to show that younger and male children tend to benefit more from remittances.

This paper proceeds as follows. Section 2 explains the method of identification. Section 3 describes the data. Section 4 presents the empirical results. Section 5 concludes.

2 Method of Identification

The objective of the paper is study the effects of remittances on children schooling of family households. We could undertake the following equation to identify the effects of remittances on school attendance.

$$y_{ij} = \alpha + \beta Remittance_j + \gamma X_{ij} + \varepsilon_{ij} \quad (1)$$

where y_{ij} is an indicator of whether a child i in household j is attending school; $Remittance_j$ is an indicator of whether household j is receiving remittances; X is a vector of child- and household characteristics that may affect school attendance such as the child's age and gender as well as the age and years of schooling of the household head or spouse and the size of the households; and ε is the error term.

However, the above specification may suffer from omitted variable bias and selection bias problems. For example, poor- and less-educated households in Indonesia are more likely to be migrant workers and send remittances to their family members back home. Unless we control for wealth, *Remittance* in equation (1) is likely to be correlated with the error terms, which makes the coefficient of *Remittance* biased. Including wealth as a control variable is also

problematic as wealth is to a large extent is a choice variable, and we do not want to introduce a choice variable in the right-hand side of equation (1).

We could solve these endogeneity problems if we could find an instrumental variable for *Remittance*. Then we could estimate equation (1) using two-stage least square (2SLS), and the estimate of the coefficient of the predicted *Remittance* in the second stage would give us an unbiased estimate of remittances on children schooling.

A good instrument for *Remittance* would need to satisfy the following two requirements: (1) it is correlated with the problematic independent variable, i.e., whether a household receives remittances, and (2) it is not related to the dependent variable, i.e., whether a child in the household is attending school. In other words, the effect of the instrumental variable on the dependent variable is only through *Remittance*.

We use two sets of instrumental variables. The first is an indicator of whether a household lives in traditionally migrant-sending districts in Indonesia. The second is the proportion of remittance households at district- and sub-district levels in the past.

These variables are correlated with *Remittance* because most migrant workers in Indonesia are originated from several districts in Java and a few other provinces. They also appeal to the notion that international migration depends on the availability of network of family and friends, in a sense that the more people from a region migrate abroad, the more likely that members of other households would also migrate abroad. Moreover, these variables are unlikely to be related to school attendance of children. Arguably, the only way that past proportion of remittance households in a district or sub-district in Indonesia affects school attendance is through remittances. These properties would then make these variables --- an indicator of whether a household lives in traditionally migrant-sending districts in Indonesia, and the

proportion of remittance households at district- and sub-district levels in the past --- good instruments for *Remittance*.

The indicator of traditionally migrant-sending districts equals one if a household lives in the following districts or provinces: Sukabumi, Cianjur, and Indramayu districts in West Java province; Cilacap and Wonosobo districts in Central Java; Kulon Progo district in Yogyakarta; Malang, Kediri, and Ponorogo districts in East Java; and East Nusa Tenggara, West Nusa Tenggara, South Sulawesi, and Lampung provinces.

We get the data on the past proportion of remittance households from the third wave of IFLS, i.e., IFLS 3. We calculate the proportion of remittance households at district- and sub-district levels, and then use these proportions as instruments for *Remittance*.

3 Data

We use the Indonesia Family Life Survey (IFLS), an on-going longitudinal household survey in Indonesia. We focus on the fourth wave of the survey, IFLS 4, which was completed in 2007.

We obtain outcome variables from the children module of IFLS 4. We define our key dependent variable, *Attending school*, equals one if a child is currently attending school and zero otherwise. We also consider other outcomes such as *Working*, which is an indicator of whether a child is working while attending school. *Repeating grades* is an indicator of whether a child has been repeating grades in the past. *Having school disruption* is also an indicator of whether a child has been experiencing school disruption in the past.

Our key independent variable is *Remittance households*, which equals one if the household has members who are migrant workers. We do not have information of whether a household receives remittances in IFLS 4. However, information on whether a household has

migrant workers is arguably a very good indicator of whether the household receives remittances because sending remittances to family members back home is a common and widespread practice among Indonesian migrant workers.[3]

We use two sets of instrumental variables to instruments for *Remittance households*. The first one is an indicator of whether a household lives in the traditionally migrant-sending households. The second set of instrument is the proportion of remittance households at district- and sub-district levels.

We also include a set child- and household characteristics. The definitions of these variables are provided in the Appendix. Table 1 shows the summary statistics of the variables.

[**INSERT TABLE 1 HERE**]

Panel A shows that children in remittance households are more likely to attend schools. They are not different from children in non-remittance households in terms of other outcomes, i.e., *Working*, *Repeating grades*, and *Having school disruption*.

Panel B presents the two child characteristics. Remittance- and non-remittance households do not differ in terms of age and gender composition. Panel C shows the household characteristics. The heads and spouses of remittance households are older, less educated, and have more mature children. The heads of households are more likely to Muslims as well.

4 Results

First, we discuss the results of the first-stage regressions, i.e., the effect of the traditionally

[3] According to (FDC, 2007), virtually all Indonesia's migrant households receive remittances: nearly 84% of them from single migrant while the rest from at least two migrants. A survey on Indonesian migrant workers (World

migrant-sending district dummy or the proportion of remittance households at district- and sub-district levels on whether a household receives remittances. Then, we examine the effects of remittances on school attendance and other measures of schooling.

4.1 The First-Stage Regressions

Table 2 presents the estimates for the first-stage regression of remittance households on the instrumental variables. The dependent variable is an indicator of whether a household is a remittance household. Each column provides a different specification, with and without child- and household characteristics dummies, using an indicator of living in the traditionally migrant-sending districts or the proportion of remittance households at district- and sub-district levels as instruments.

[**INSERT TABLE 2 HERE**]

In columns 1-2, we used an indicator of whether a household lives in the traditionally migrant-sending districts. The estimated coefficients are positive and significant statistically. Column 2 in which we control for a set of child- and household characteristics, we find that living in the traditionally migrant sending districts increases the likelihood of being a remittance household by four percent.

In columns 3-4, we used the proportion of remittance households at district- and sub-district levels as instruments. We find that in column 3 the estimates of the instrumental variables are positive and significant statistically. Once we control for the child- and household characteristics in column 4, the estimate of the proportion at district level becomes less significant. We kept the two instrumental variables from our first-stage regression of the IV

Bank, 2006) finds that although the frequency of remittances by migrants is irregular, most migrants remit 2-4 times

estimation.

4.2 The Effect of Remittances on School Attendance

Table 3 presents the results for the effect of remittances on school attendance. The dependent variable is an indicator of whether a child is currently attending school. The independent variable of interest is, remittance household, is an indicator of whether the child is a member of household-receiving remittances. Each column provides a different specification, with and without child- and household characteristics dummies, estimated using OLS or IV estimator. The set of child- and household characteristics included are the same as those listed in Table 2.

[**INSERT TABLE 3 HERE**]

Columns 1-2 show that remittance household and school attendance are positively correlated: A child in a remittance household is more likely to be attending school. Columns 3-4 present the results using IV method in which the instrument is an indicator of whether a household is in traditionally migrant-sending districts. Regression that includes child- and household characteristics in column 4 suggests that remittances make a child 83 percent more likely to remain in school. Columns 5-6 show the results using the proportion of remittance households at district and sub-district levels as instruments. Without the child- and household characteristics dummies in column 5, the estimate is positive, though it is not significant statistically. Including the control variables in column 6 improves the precision of the estimation. The estimate is not large in magnitude and significant statistically: Remittances increase the likelihood that a child remains in school by 23 percent.

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a year.

4.3 Robustness Checks

There is some concern that our results rely too much on the assumption that migrant workers send remittances to family members in Indonesia. We therefore focus on migrant workers who are immediate family members who are more likely to send remittances. In the first case, Remittance A, we consider a household is a remittance household if it has migrant workers who are the household heads, the spouse or the children. In the second case, Remittance B, we define remittance household to be one whose head or spouse is a migrant worker.

Table 4 presents the results.

[**INSERT TABLE 4 HERE**]

In columns 1-2 in which we consider household head, spouse, or children migrant workers to define remittance household, we find that remittances increase the likelihood of school attendance. Column 2 shows that, after controlling for child- and household characteristics, remittances increase the likelihood of school attendance by 27 percent.

Columns 3-4 show the results in which we define remittance household if the head or spouse is a migrant worker. Without child- and household characteristics in column 3, the estimate is positive, though it is not significant statistically. After controlling for the child- and household characteristics in column 4, the estimate is now large and significant statistically: Remittances increase the likelihood of school attendance by about 80 percent. If a child is in a household whose head or spouse is a migrant worker, the child is almost surely attending school.

4.3 The Effect of Remittances on Other Schooling Outcomes

We now examine whether remittances also lead to other outcomes such as whether a

child is working while attending school, whether the child repeats grades, and whether the child experiences school disruption. Table 5 presents the results.

[**INSERT TABLE 5 HERE**]

Columns 1-2 show the results for the child labor indicator. After controlling for child- and household characteristics in column 2, we find that the estimate is negative. It is small in magnitude and insignificant statistically. There is no evidence that remittances reduce the likelihood that a child is not working while attending school.

In columns 3-4, we present the results for grade repetition. The estimates are positive. They are small, however, and insignificant statistically. The same applies in columns 5-6 on the effect of remittances on an indicator of whether a child experiences school disruption. We do not find evidence that remittances improve a child's performances in terms of grade repetition or reduces the likelihood that he/she experience school disruption.

5 Concluding Remarks

We examine the effect of remittances on education in Indonesian household using the Indonesian Family Life Survey. The study controls for various family characteristics and endogeniety problems using IV estimation. The results indicate that remittances increase the likelihood that a child remains in school by 23 percent. Using the IV estimation, controlling for the child- and household characteristics, the estimate is now large and significant statistically. The results of the paper indicate that a child is in a household whose head or spouse is a migrant worker, the child is almost surely attending school.

We also examined whether remittances also lead to other outcomes such as whether a child is working while attending school, whether the child repeats grades, and whether the child

experiences school disruption. We do not find evidence that remittances improve a child's performances in terms of grade repetition or reduces the likelihood that he/she experience school disruption.

Although remittances increase the school attendance of children, the above results indicate that quality of schooling for the children does not increase from the remittances. This indicates that the trade-off of parents leaving the household and working overseas tends to have negative impact on the human capital accumulation of the child.

The study could be improved by actually accounting for the families receiving the remittances. In this study, we do not have such information. This will show the direct impact of remittances on the household decision to invest in education.

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Appendix:

Definition of Variables

Variables	Definitions
A. Outcomes	
Attending school	An indicator of whether a child is attending school
Working	An indicator of whether working while attending
Repeating grades	An indicator of whether repeating grade
Having school disruption	An indicator of whether experiencing school disruption
B. Instrumental variables	
Traditionally migrant-sending district	An indicator of whether a household lives in the district
Proportion of remittance households at district and sub-district levels	Two variables, the proportions at district- and sub-district levels
C. Child's characteristics	
Age	A set of age dummies
Male	An indicator of whether a child is male
D. Household's characteristics	
Average age of household head and spouse	A set of age dummes
Years of schooling of household head	A set of years of schooling dummies
Number of school-age children	A set of dummies
Number of mature children	A set of dummies
Religion of household head	A set of religion dummies
Ethnicity of household head	A set ethnical group dummies

Table 1: Summary Statistics

	Non-Remittance Households	Remittance Households
	(1)	(2)
A. Outcomes		
Attending school	0.92	0.95
	(0.28)	(0.21)
Working	0.05	0.05
	(0.22)	(0.21)
Repeating grades	0.09	0.08
	(0.29)	(0.28)
Having school disruption	0.01	0.00
	(0.09)	(0.06)
B. Child's characteristics		
Age	10.34	10.92
	(2.70)	(2.64)
Male	0.51	0.54
	(0.50)	(0.50)
C. Household's characteristics		
Average age of household head and spouse	43.63	50.03
	(13.79)	(12.81)
Years of schooling of household head	7.52	4.97
	(4.52)	(3.84)
Number of school-age children	1.20	1.11
	(1.23)	(1.18)
Number of mature children	0.91	1.77
	(1.43)	(1.64)
Javanese dummy	0.41	0.37
	(0.49)	(0.48)
Islam dummy	0.88	0.94
	(0.32)	(0.23)

Notes: The number of observation is 9,000-13,000 for non-remittance households and 500-800 for remittance-households. The numbers in parentheses are standard deviations. Description of the variables is available in the Appendix.

Table 2: The First-Stage Regressions

Dependent Variable: Remittance households				
	Instrument A		**Instrument B**	
	(1)	**(2)**	**(3)**	**(4)**
A. Traditionally migrant sending districts				
Dummy	0.08	0.04		
	(0.01)	0.02		
B. Proportion of remittance households at				
... district level			0.65	0.23
			(0.12)	(0.15)
... sub-district level			0.48	0.59
			(0.11)	(0.15)
Child characteristics dummies				
Age		✓		✓
Gender		✓		✓
Household characteristics dummies				
Average age of household head and spouse		✓		✓
Years of schooling of household head		✓		✓
Religion of household head		✓		✓
Ethnicity of household head		✓		✓
Number of school-age children		✓		✓
Number of mature children		✓		✓
Number of observations	14,612	7,890	12,383	6,711
Number of households	10,873	4,675	9,173	3,958

Notes: The dependent variable is an indicator of whether a household receives remittances. Instrument A is an indicator of whether the household lives in traditionally migrant-sending districts. Instrument B includes the proportion of remittance households at district- and sub-distric levels. The numbers in parentheses are robust standard errors clustered at household level. Description of the variables is available in the Appendix.

Table 3: The Effect of Remittances on School Attendance

Dependent Variable: Attending school						
	OLS		**IV (Instrument A)**		**IV (Instrument B)**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Remittance household dummy	0.04	0.04	0.19	0.83	0.05	0.23
	(0.01)	(0.01)	(0.10)	(0.43)	(0.05)	(0.08)
Child- and household chars. dummies		✓		✓		✓
Number of observations	9,088	7,806	9,088	7,806	7,732	6,639
Number of households	5,387	4,622	5,387	4,622	4,555	3,912

Notes: The dependent variable is an indicator of whether a school-age child is attending school. Instrument A is an indicator of whether the household lives in traditionally migrant-sending districts. Instrument B includes the proportion of remittance households at district- and sub-distric levels. Even-numbered regressions include all sets of child- and household dummies. The numbers in parentheses are robust standard errors clustered at household level. Description of the variables is available in the Appendix.

Table 4: Robustness Checks

Dependent Variable: Attending school				
	Remittance A		**Remittance B**	
	(1)	**(2)**	**(3)**	**(4)**
A. Remittance households: The migrant worker is				
... head, spouse, or children	0.06	0.27		
	(0.07)	(0.09)		
B. Remittance households: The migrant worker is				
... head or spouse			0.29	0.79
			(0.30)	(0.37)
Child- household characteristics dummies		✓		✓
Number of observations	7,732	6,639	7,732	6,639
Number of households	4,555	3,912	4,555	3,912

Notes: The dependent variable is an indicator of whether a school-age child is attending school. Remittance households in Panel A are those whose head, spouse or children is a migrant worker; remittance households in Panel B head or spouse. The instruments are the proportion of remittance households at district- and sub-distric levels. Even-numbered regressions include all sets of child- and household dummies. The numbers in parentheses are robust standard errors clustered at household level. Description of the variables is available in the Appendix.

Table 5: The Effect of Remittances on Other Schooling Outcomes

Dependent Variable: The child works, repeats grade, or has school disruption						
	Work		**Repeat Grades**		**Disruption**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Remittance household dummy	0.002	-0.002	0.02	0.01	-0.001	0.02
	(0.05)	(0.06)	(0.06)	(0.09)	(0.02)	(0.03)
Child- and household chars. dummies		✓		✓		✓
Number of observations	7,308	6,277	7,309	6,278	7,309	6,278
Number of households	4,356	3,743	4,356	3,743	4,356	3,743

Notes: The dependent variable is an indicator of whether a school-age child is working, repeating grades, or experiencing school disruption. The instruments are the proportion of remittance households at district- and sub-distric levels. Even-numbered regressions include all sets of child- and household dummies. The numbers in parentheses are robust standard errors clustered at household level. Description of the variables is available in the Appendix.