

## **How do Remittances Impact Human Capital Formation of School Age Boys and Girls?**

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## **How do Remittances Impact Human Capital Formation of School Age Boys and Girls?**

Cynthia Bansak and Brian Chezum\*

In this study, we revisit the impact of remittances on educational attainment of school age children, paying particular attention to differences between girls and boys. A heightened interest in understanding the remitting practices of immigrants and their impact on a variety of economic indicators has emerged as remittances to developing countries have recently risen substantially, in some cases surpassing development assistance flows (World Bank, 2006). In Nepal, for example, the World Bank reports that remittances amounted to \$1.2 billion (US dollars) in 2006, while GDP was \$7.4 billion and official development assistance and aid totaled approximately \$425 million (World Bank 2007). We use the 1995/1996 Nepal Living Standards Survey to examine the impact of remittances on human capital investments for female and male children. If remittances do positively affect human capital, then not only will remittances affect long-run growth in Nepal, but the opportunities for women in Nepal should improve as the female population becomes more educated.

The effect of remittances on human capital investment is unclear *a priori*. First, increasing income through remittances should relax household budget and capital constraints increasing the opportunity to invest in children's schooling. Conversely absenteeism in the household puts pressure on children to work at home reducing time available for education. Our data provides a unique opportunity to understand and separate out the effect of household disruption from the change in income from remittances on the decision to invest in schooling. Specifically, we are able to measure the number of adults living outside the household. Therefore, we are able to examine the impact of remittances on schooling for male and female children, controlling for the extent of absenteeism in the household. We examine this question

across gender and ask if the impact varies by age group (young child vs. older child)? Our results indicate that young children benefit more from remittances than do older children, but that the benefits, controlling for absenteeism, tend to be stronger for male children.

## I. Theoretical Predictions Regarding the Human Capital Impact of Remittances

According to the model of Hanson and Woodruff (2003), remittances may have both positive and negative effects on the educational attainment of school age children. Furthermore, there may be differential effects by gender of the children. The two offsetting possibilities are as follow:

(a) *Increasing household income*: If remittances increase household income, families may choose to send their children to school and may no longer rely on them for market and non-market work. In this case, remittances may increase educational attainment of children. To the extent that families face tight capital and income constraints, parents may choose to provide greater access to education for all or a subset of their children. In particular, since male children may face a greater obligation in providing for elderly parents, investing in the education of male children may provide additional financial support for elderly parents. Remittances may also create additional educational opportunities for female children. While the opportunity cost of lost household production may be high for young women, remittances may be used to purchase goods and services and allow households to substitute consumption for labor-intensive household production (Blau, Ferber, and Winkler 2006).

(b) *Disruption of Family Structure*: When a family member leaves the household to work and send remittances back, there may be disruption due to the loss of a productive adult member of the family. As a result, children may be required to work to offset the market and non-market work performed by the missing adult.

Given the comparatively higher work requirement of boys relative to girls and the higher likelihood that they will attend school if funds are available, one would expect these two effects to be stronger for boys than for girls.

## II. Methodology

In our methodological approach, we explore how remittances affect the human capital formation of male and female children through models that account for the migration and remitting decisions by household members. Specifically, we address the inherent endogeneity problem when focusing on the effects of a group that has decided to migrate and remit to their family. Specifically, we estimate a 2SLS model of human capital investment and use whether a child is currently enrolled in school as our measure of educational attainment.

In our specification, the likelihood of being enrolled in school for a school-aged child  $i$ , in household  $h$ , and region  $r$ , can be described as:

$$(1) \quad InSchool_{ihr} = \beta_0 + \beta_1 Relative\ Net\ Remit_h + \beta_2 Absent_h + \phi C_i + \chi P_h + \delta H_r + v_{ihr} .$$

where we describe the likelihood of attending school as a function of a vector of personal characteristics of the child ( $C_i$ ) – such as age and birth order; a vector of parental characteristics ( $P_h$ ) – such as mother's education, father's education, and variables for mothers maternity history; and characteristics of the household ( $H_r$ ) – such as the number of individuals in the household, number of adults in the household and whether the household is located in a rural area.

Our parameters of interest,  $\beta_1$  and  $\beta_2$ , can be interpreted as direct tests of the income effect of remittances and the disruption effect of migration on the education of both male and female children. The variable *Relative Net Remit* is used to measure the importance of remittances in the household relative to household resources. It is worth noting that our remittance variable is

the net of remittances sent and received and therefore varies over both the positive and negative domain. A negative value indicates that the household is a net sender of remittances, a positive value a net recipient. We predict that as this variable becomes more positive, income and capital constraints become more relaxed for the household which increases the opportunity for a child to acquire human capital; thus we predict  $\beta_1 > 0$ . The variable *Absent* is used to measure the extent to which migration disrupts the family structure and we expect  $\beta_2 < 0$ ; an increase in household absenteeism induces the household to substitute child labor into household production and reduces the child's chance to attend school.

We expect that our parameters of interest may be biased and we use instrumental variables to address the possible endogeneity when modeling the decision to migrate. In particular, least squares estimates of the impact of absenteeism and remittances may be biased as the decision to live outside the household and send remittances is simultaneously determined with the probability of a child attending school. The direction of the bias, however, is unclear as there are multiple offsetting factors that one would want to capture.

On one hand, if we do not control for all facets of ability, it is possible that our measures of migration, *Relative Net Remit* and *Absent*, may be biased upward. This would be the case if ability is a determinant of migration and if ability of the family member is positively correlated with the likelihood that a child attends school. If we assume that high ability individuals earn a higher income from migration, one could argue that these individuals may be more likely to find migrating worthwhile and thus, on average, have higher net remittances and absenteeism from their households. Furthermore, it is likely that innate ability of the migrant would be correlated with that of the children in the household. If these children, in turn, are more likely to realize success in school, then they are more likely to be enrolled in school.

On the other hand, if negative job shocks not accounted for in the model push individuals to migrate there may be downward bias in our estimates of the impact of remittances and migration on schooling. Job displacement lowers household income and therefore encourages both migration and remittances. We should expect the lost income to lower a household's ability to invest in human capital and pressure the household to rely more on the children's household production.

To control for these possibilities, we estimate the schooling equation via an instrumental variable regression which endogenizes remittances and household absenteeism. The first stage regressions in this framework are given by:

$$(2) \quad \text{Relative Net Remittance}_{ihr} = \gamma_0 + \gamma_1 C_i + \gamma_2 P_h + \gamma_3 H_r + \pi Z_{ihr} + \omega_{ihr}$$

$$(3) \quad \text{Absenteeism}_{ihr} = \alpha_0 + \alpha_1 C_i + \alpha_2 P_h + \alpha_3 H_r + \lambda Z_{ihr} + \mu_{ihr}$$

where  $Z$  is a vector of excluded instruments correlated with remittances and absenteeism but uncorrelated with schooling decisions.

### III. Data

Using data from the 1995/1996 Nepal Living Standards Surveys (NLSS) we construct a sample of 4,629 school age children. The NLSS surveys contain information on the extent, nature and determinants of poverty in Nepal and cover different aspects of household welfare, including consumption, income, housing, access to facilities, education, health, employment, access to credit and remittances. In particular, we make use of the information collected by the NLSS regarding the educational attainment of children in households receiving remittances to sort out the impact of remittances on educational investment by households.

Our interest is to understand the impact of remittances on schooling and differences across gender in Nepal. These key variables are defined as follows. To characterize human

capital investments at the individual level, we define *In School* as equal to 1 if the individual is currently enrolled in school and zero otherwise. For remittances, each household is asked if they have received or sent remittances. In the sample, among 3,373 households, approximately 10% send remittances while 22.5% receive remittance; among these, 4% both send and receive. Furthermore, remittance data is collected for both cash and in-kind remittances, with households reporting a cash value of in-kind transfers. We construct the variable *Relative Net Remittances* as total remittances (cash plus in-kind) received minus remittances sent all divided by total household consumption. A positive value of relative net remittances indicates that on balance, the household is receiving positive transfers from others. We argue that total consumption proxies reasonably well for household total income and provides a basis for the relative impact of the remittances for the household. In addition, the survey queries the number of months the individual spends out of the home for each household member and allows us to measure a disruption effect directly. The variable *Absent* is defined as a ratio of the total number of adults from the household that spent at least one month away from the home to the total number of individuals in the household.

We also include a number of controls at the child level, parent level, and household level for our analysis. Our sample is limited to school age children which we define as ages 5 to 16. We further differentiate between young children (5 to 10) and older children (11 to 16) based on the Nepali school system. Although education was not compulsory during our survey years, there is currently an effort to introduce mandatory education for children up through primary school, which corresponds to approximately 10 years of age. We also include a measure of birth order which combines birth order and family size into a birth index. Following Booth and Kee (2005) we define *Birthindex* as the child's order of birth divided by the total number of siblings

plus one. The index has the advantage of purifying birth order of the complication of differences driven by family size.

For parents, we include variables that capture educational attainment in addition to measures of mothers' maternity history. Specifically, dummy variables for primary, middle and secondary education were constructed to control for highest level of education completed. For the mother, we include total number of children (*Mothers Children*) and total number of children that have survived to at least age 5 (*Survival Age 5*) as measures of fertility and mortality.

Given the complex nature of Nepali households, we include the total number of individuals in the household (*Household Size*) and total number of adults (*Household Adults*) to control for household size and structure. Finally, we include a dummy variable indicating if the household is located in a rural area.

Lastly, we need instrumental variables that are correlated with the endogenous dependent variables (remittances and absenteeism) but are uncorrelated with schooling. The instrumental variables we have selected measure past literacy rates and political unrest by district. Together, these variables proxy for migrant and local network effects which are standard instruments adopted in the literature (Hanson and Woodruff 2003; Acosta, et. al. 2007). For literacy, we include literacy rates by district in 1981. These rates vary widely from 8.5% in Kalikot nearly 50% in Kathmandu. We hypothesize that in districts where literacy is relatively high there are historically better job prospects possibly due to agglomeration economies. As a result, migration may be less substantial in the past for these districts which may diminish the availability of migration networks for individuals currently living in the district. This should reduce the rate of absenteeism within the household as well as the level of remittances.

Regarding political unrest, a number of districts were under Maoist insurgent control in Nepal in the 1990s. To the extent that social networks play a role in migration and remittance decisions, these networks were likely disrupted by the Maoist rebellion. The Nepali government classifies districts by the degree of insurgent pressure/control from high to low as Class A, Class B, and Class C. Unclassified districts have little or no insurgent activity; we use these definitions to define our instruments as dummy variables.

#### IV. Results

Table 1 presents our results from our instrumental variables regressions of human capital formation of school age children. Columns one through four show our second stage results of the likelihood of being in school by gender (boys and girls) and age group (5 to 10 and 11 to 16). Columns five and six display the first stage regressions of relative net remittances and absenteeism, respectively.

Starting with our first stage regressions for relative net remittances, the joint significance test of the excluded variables provides support for their validity as instruments ( $F=8.07$ ). In this specification, the coefficient on class C (low insurgent control) is positive and significant at standard levels, and is the only individually significant instrument. Column 6 provides first stage results for absenteeism. In this specification, our instruments are jointly significant ( $F$ -statistics = 8.74) while only the 1981 literacy rate and class B (moderate insurgent control) are individually significant. The results provide some support for insurgency characteristics and literacy rates as proxies for social networks affecting migration and remittance activity.

Turning to our results of primary interest, we observe first that the coefficient for *Relative Remittances* is positive in all specifications but statistically significant only for the young boy and young girl sub-samples. Controlling for the disruption effect caused by absentee household

members (*Absent*), our results indicate that households with positive net remittances are more likely to send their young children to school. In comparing regressions for boys and girls, we observe that the coefficients for boys are consistently larger than the estimated effect for girls. The coefficient for young boys is over 3 times larger than the coefficient for girls. The coefficients for older boys and girls show a similar pattern although both are statistically insignificant. It would appear that young boys gain more from remittances than do girls.

Our results also indicate a significant disruption effect exists in the data. Examining the coefficients on *Absent* we observe that the coefficient is negative and significant at at least the 10% level for all sub-samples. For boy and girl samples the effect is larger for older children. More intriguing is the comparison across gender within age group. The measured disruption effect is 72% larger for young boys as compared to young girls. Conversely, the coefficient is nearly identical for older boys and girls. Our results indicate that girls benefit relatively less from remittances but suffer less harm from household disruption when examining the impact on human capital collection.

## V. Conclusions

We examine the joint role of remittances and absenteeism on household decisions to invest in children's human capital. Using a sample of 4,629 children from 3,373 households represented in the 1995/1996 Nepal Living Standards Survey, we estimate the effect of remittances and absenteeism on the probability a child within a household attends school. We estimate the relationship using four sub-samples of the data (young girls, young boys, older girls and older boys). Our results indicate that young girls benefit relatively less from remittances but suffer less harm from household disruption when examining the impact on human capital collection.

Given that remittances amount to 16% of GDP in Nepal, it is clear that the country's ability to achieve development goals hinge on the internal usage of remittances. Among the UN Millennium Development Goals for 2015 is the ability to "promote gender equality and empower women" (United Nations 2007). As gender equality is no doubt related to educational levels, our research helps to clarify the extent to which non-governmental transfers may help a nation achieve improved outcomes for women.

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## References

- Acosta, Pablo A., Fajnzylber, Pablo R. and Lopez, Humberto.** 2007. "The Impact of Remittances on Poverty and Human Capital: Evidence from Latin American Household Surveys". World Bank Policy Research Working Paper No. 4247.
- Blau, Francine, Marianne Ferber, and Ann Winkler.** 2006. *The Economics of Women, Men, and Work*, 5th Edition, Pearson Prentice-Hall.
- Booth, Alison and Hiau Joo Kee.** 2005, "Birth Order Matters: The Effect of Family Size and Birth Order on Educational Attainment." Centre for Economic Policy Research, The Australian National University, Discussion Paper 506.
- Hanson, G.H. and Christopher Woodruff.** 2003, "Emigration and Educational Attainment in Mexico." Mimeo, University of California San Diego.
- World Bank.** 2006. *Global economic prospects 2006 : economic implications of remittances and migration*. The International Bank for Reconstruction and Development / The World Bank.
- World Bank.** 2007. Nepal Data Profile.  
<http://devdata.worldbank.org/external/CPProfile.asp?PTYPE=CP&CCODE=NPL>
- United Nations.** 2007. UN Millennium Goals.  
<http://www.un.org/millenniumgoals/>

Table 1: Instrumental Variable Regressions

	Young-Male	Old Male	Young Female	Old Female	Rel Net Remit	Absent
Rel Net Remit	3.902** (2.10)	5.149 (1.22)	1.228** (2.36)	0.674 (0.64)		
Absent	-6.297* (1.74)	-9.873* (1.84)	-3.66** (2.10)	-9.887*** (3.09)		
Age	0.106*** (3.37)	-0.021 (0.54)	0.066*** (4.79)	-0.076** (2.14)	-0.004** (2.22)	0.001* (1.70)
Birthindex	0.105 (1.00)	0.077 (0.50)	0.214*** (3.58)	0.361** (2.27)	-0.012 (0.93)	0.014*** (2.79)
Primary_Mother	0.367* (1.87)	-0.122 (0.35)	0.295*** (3.51)	-0.057 (0.25)	-0.025 (1.13)	-0.004 (0.42)
Middle_Mother	0.186 (0.82)	-0.462 (0.76)	0.167 (1.34)	-0.118 (0.41)	0.025 (0.85)	0.002 (0.16)
Secondary_Mother	0.331 (1.35)	0.528 (1.19)	0.198 (1.51)	0.169 (0.72)	0.009 (0.33)	0.038*** (3.70)
Primary_Father	0.074 (0.75)	-0.013 (0.07)	0.188*** (3.73)	0.243** (2.00)	0.014 (1.10)	0.002 (0.42)
Middle_Father	0.145 (1.11)	0.274 (1.40)	0.394*** (5.09)	0.563*** (2.93)	0.012 (0.69)	0.013* (1.88)
Secondary_Father	0.141 (1.06)	0.407* (1.85)	0.4*** (5.17)	0.644*** (3.49)	-0.021 (1.28)	0.007 (1.05)
Mothers Children	-0.028 (1.16)	-0.033 (0.98)	-0.041*** (2.90)	-0.045* (1.73)	-0.001 (0.33)	-0.003** (2.48)
Survival Age 5	0.066 (0.40)	0.034 (0.22)	0.118 (1.48)	-0.02 (0.13)	-0.008 (0.46)	0.001 (0.16)
Household Size	-0.047 (1.26)	-0.071 (1.40)	0.003 (0.17)	-0.026 (0.79)	-0.003 (0.95)	-.005*** (4.27)
Household Adults	0.136 (1.54)	0.155 (1.47)	0.033 (0.80)	0.134* (1.92)	0.014*** (2.69)	0.017*** (8.31)
Rural	0.115 (0.70)	0.433 (1.35)	-0.133 (1.52)	0.147 (0.91)	0.036** (2.46)	0.033*** (5.85)
Literacy_rate 81					0.01 (0.18)	-.094*** (4.47)
Class A					-0.015 (0.60)	-0.009 (0.95)
Class B					0.015 (1.02)	0.018*** (3.11)
Class C					0.069*** (5.53)	0.004 (0.73)
Constant	-0.248 (0.79)	1.158** (1.98)	-0.03 (0.19)	1.552*** (3.09)	0.049 (1.44)	0.027** (2.05)
First Stage F					3.98	15.89
Observations	1,294	1,087	1,264	984		

**Notes:** \*\*\* Statistically significant at the 1 percent level or better, \*\*statistically significant at the 5 percent level and \*statistically significant at the 10 percent level. T-statistics are reported in parentheses below the coefficients.