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**Centre d'Analyse Théorique et de  
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**THE IMPACT OF REMITTANCES  
ON HOUSEHOLD INVESTMENTS  
IN CHILDREN'S  
HUMAN CAPITAL:  
EVIDENCE FROM MOROCCO**

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The impact of remittances on household investments  
in children's human capital:  
Evidence from Morocco

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**Abstract**

Using a nationally-representative household data set from Morocco, the present study seeks to estimate the effects of migrants' remittances on household investments in children's human capital. Three findings emerge. First, children in remittance-receiving households are more likely to attend school and less likely to drop out compared with those in non-remittance-receiving households. Second, children's participation in labor market decreases in the presence of international remittances. Third, we find remittances to be associated with significantly lower level of no schooling for girls. These findings support the growing view that remittances can help increase the educational opportunities, especially for female children.

**Key words**

Child Labor, Education, Gender Inequality, Remittances, Morocco

## 1. Introduction

Remittances appear to be one of the most visible effects of the international migration phenomenon for migrant sending countries. The most direct impact of these money flows on the migrants' families is to increase their income. At the same time, they can affect the monetary resources allocated to certain expenditure categories, especially those measuring physical and human capital investments. In the literature there are at least two views on how remittances are used. The first view is that remittances tend to get spent on consumption rather than productive investment. For instance, Chami, Fullenkamp, and Jahjah (2003) have reported that remittances are not used for investment and therefore they not appear to be a significant source of capital for economic development. The second view argues that since remittances are a transitory income for households, they tend to spend them more at the margin on investment goods (especially on housing, education and health). For example, Adams and Cuecuecha (2010) have found that households receiving remittances spend more on investments such as education and housing, and less on consumption (food and consumer goods) than do households not receiving remittances. This is likely to be more important for long-term growth prospects of developing countries.

Several recent studies have analyzed the household investments in children's human capital development in some developing countries by documenting a correlation between remittances and child education (Yang, 2008; Calero et al., 2008; Mansuri, 2006; Lopez-Cordova, 2006; Cox and Ureta, 2003) and labor (Acosta, 2006; Calero et al., 2008; Gang et al., 2011). A large literature has attempted to explore the change in children's education impact of remittances when the characteristics of those who receiving them are taken into account. Calero et al. (2008) have provided evidence that the financial transfers of Ecuadorian migrants reduce the non-enrollment of children by 19%, but their positive effect is greater on girls and on children from poor households or those living in rural areas. Cox and Ureta (2003) have shown that in urban areas of El Salvador, the effect of international remittances on children's education expenses is at least 10 times higher than incomes received from other sources while in rural areas, their effect is multiplied by 2.6. Besides, Hanson and Woodruff (2003) have argued that the effect of Mexican migration on child education is positive only for girls in

households with relatively uneducated mothers. Similarly, McKenzie and Rapoport (2006, 2011) have looked at the impact of Mexican migration on the academic success of rural children who are between 12 and 18 years old and have highlighted the substantial role that may play maternal education in the schooling of children living in migrant households. However, other studies (such as Lopez Cordova, 2006; McKenzie and Rapoport, 2006, 2011) have found, particularly in the case of Mexico, negative effects of international migration and remittances on child education. For instance, McKenzie and Rapoport (2006, 2011) have reported that, boys living in migrant households are more likely to leave school after completing the basic primary cycle as the probability to migrating is likely to be higher.

Despite the fact that the alternative to education could, for instance, be work or leisure, only a few studies have explored how international remittances could influence child work in developing countries where children can be perceived as generators of family income. Economic models of children's activity have suggested that several factors may deeply cause children to work such as poverty, inefficiency of the credit market and social norms. There is a clear evidence that poverty (and, more generally, liquidity-constrained) is the potential determinant of child labor (Basu and Van, 1998; Cigno and Rosati, 2000; Ersado, 2003). It forces households to take their children out of school and send them to work in order to survive. Clearly, the low investment in human capital can be explained by the imperfections of capital market in the developing world that restrict households from borrowing against their or children's future income. Simply provide households enough additional income can help loosen the financial constraints of the families and then encourage them to invest more in their children's schooling, thereby reduce child labor (Edmonds, 2006). Lowering resource constraints for the poor in particular could lead to higher investments in schooling for girls and a reduction in gender inequalities in access to schooling (Mansuri, 2006). And indeed it may be interesting to look into how the extra income gains from remittances for example can affect human capital investment. However, in a setting of rural economy (which is the case of many developing economics), where few non-agricultural labor opportunities and child labor persistence even among the wealthiest households (Bhalotra and Heady, 2003), one could envisage a situation whereby the remittances encourage child employment. As mentioned earlier, there is a limited but consistent amount of evidence

on the positive effect of remittances on labor supply in some developing countries. In fact, empirical estimates of the impact of remittances on child labor are scarce, mainly due to a shortage of useful datasets.

From the standpoint of economic development, the basic question is: Are remittances channelled into human investments in origin countries? The purpose of this paper is to refine and extend the debate concerning how remittances affect child well-being by using the results of a large, nationally-representative household survey in Morocco. We explore children allocation time among market work, education, and leisure, depending on the reception of migrants' remittances by the households. Moreover, since school attendance and child labor are not necessarily perfectly inversely correlated in time allocation, many children engage jointly in schooling and labor activities in various countries. We try therefore to find out whether remittances have a significant impact on the children combining work and education in Morocco.

Empirically, the challenge is to estimate a model of the child labor (schooling) decision which captures the household's behavior with respect to the relevant determinants of child labor (school attendance). This paper presents one such approach, relying on a reduced-form model taking into account several variables which control of the economic ability, human capital and other factors that are likely to affect the investment in children's human capital. There has been considerable debate over whether households' socio-economic characteristics affect this investment. This study reviews the evidence on the effect of parents' educational attainment, mother's education in particular, on time allocation of children. Furthermore, the incidence of child labor and school attendance may vary largely with children's individual demographic characteristics (such as age and gender). Empirical evidence on these aspects will also be presented in the present research.

Our paper differs from other studies in two points. First, it aims at investigating the main determinants of current attendance, illiteracy, economic activity and dropout of school of children aged from 6 to 14 by disaggregating data by gender and looking more particularly at the impact of remittances on gender inequalities in schooling. To our knowledge, this is the first study that has looked at the effects of remittances on these indicators of child time allocation simultaneously. The baseline specification we use for our analysis is a probit model with four outcomes: attended school, engaged in child

labor (or combined work and school), never been enrolled and dropped out of school. Second, we illustrate the remittances' effects on children's human capital by using data on household remittances and international migrants from a previously unexamined source: Moroccan Living Standards Measurement Survey (LSMS). The LSMS contains more detailed information on community, household, and child characteristics. To date, most of our understanding of the impacts of remittances on children time allocation in Morocco comes from a limited number of rural community case studies (Bouoiyour and Miftah, 2014). Morocco, which is the third largest remittance-recipient country in the MENA region, is an ideal site to study the remittances and their implications in terms of investment in children's human capital. Remittances to Morocco are estimated by the World Bank at more than \$6.88 billion in 2013, which is about 6.6% of its GDP. These inflows have increased significantly over the past decade: from less than \$2.2 billion in 2000 to more than \$6.7 billion in 2007 just before the economic crisis and \$6.89 billion in 2008. As a percentage of GDP, remittances are larger than foreign direct investment. Together with tourism, migrants' remittances represent the country's major source of foreign currency receipts. In 2013, the country continued to depend on these external flows which provided an essential financial support to its balance of payments. Further, in Morocco completion rates are typically lower for girls, for children in poor households and for those living in rural areas. According to UNICEF estimates, in Morocco, one in four children aged between 9 and 15 leaves school before the end of compulsory schooling. Out of every hundred children, 58 % are girls, 80% live in rural areas and 40% work. Thus, an accurate understanding of how household resources affect child human capital investments seems of large importance and thus needs to be retackled.

The rest of the paper is organized as follows. Section 2 describes the 2006-07 survey and discusses our preliminary hypotheses. Section 3 contains the empirical strategy. Section 4 presents estimation results. Section 5 concludes.

## **2. Preliminary hypotheses and data used**

The data we use comes from the 2007 survey on households' standard of living. The sample representative of the Moroccan population has approximately 7,062 households

in 60 provinces of Morocco. It collects, among other data, information on household structure, education, income, housing and health. We focus on girls and boys ages 6 to 14 years old who are defined as children under most international conventions. In fact, the Moroccan children start their primary education at the age of 6 and should finish their middle secondary education at the age of 15, which partly explains why the sample has been restricted to 6,589 individuals whose age is within this range. We should mention at this stage that this age restriction on the sample is common in the literature on child labor.

The observations included 749 children in remittance recipient households, and 5,840 children in no recipient households. Among the 6,589 children, 5,598 (85 percent) were enrolled in school at the time of the survey. There were 497 school dropouts (29 are dropped out of schools in the survey year and 468 who have been out of school for some time), and 494 children had never been enrolled. Among those who never enrolled, 56.3 percent were below age 10 at the time of the survey. In our sample, 15 percent of households receive transfers from abroad.

Table 1 presents selected summary statistics with households divided by their remittance-receiving condition. It suggests several interesting differences between recipient and non recipient households. For example, household heads are older in remittance-receiving households. There is difference in the level of spending between the recipient and non recipient households. In fact, remittances increase the annual expenditure of a recipient household; they account, on average, for around 40 per cent of total household expenditure.

**Insert table 1 here**

It is most commonly believed that the higher the level of household income is, the higher the level of expenditure on education would be (Dahl and Lochner, 2012). Further, highly educated parents are likely to have higher incomes and can afford to send their children to school. These parents are more aware of the value of education, in particular the future (monetary) returns to education. Literatures on intra-household allocation and human capital investment indicate that investments in child education increase significantly in contexts where mothers are more educated (Liu and Leight,



2015). McKenzie and Rapoport (2006, 2011) also suggest that mothers' education can be served as a predictor of the parents' earnings potential that could be invested in the siblings' schooling. This suggests that mothers' education represents the household's ability to support the children's education. From this perspective, our paper has used mothers' education as proxy of household income. Further, it is important to note that the household income can be affected by labor supply of children and that the expenditure can be made simultaneously with household' decision to invest in children's human capital (Glewwe and Jacoby, 1994)<sup>1</sup>. In this study, we measure household socio-economic status by constructing at the household level adequate living standards variables including access to internet, electricity, safe drinking water and essential health care services<sup>2</sup>. At the household level, these latter variables take a value of one if the household has access to electricity, drinking water, internet and medical care<sup>3</sup>, zero otherwise.

Household investment in children will also be influenced by other internal factors in the household that we are able to take into account, such as the household size and the gender of the head of the household as well as external factors, such as the area of residence and the community characteristics. Finally, the communal human development index (noted "ICDH")<sup>4</sup> is also considered to describe community conditions that may affect the child education and labor.

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<sup>1</sup> Further, empirical economic literature on migrants' remittances indicates that household expenditure (or income) is not as helpful as regards the well-being of migrant household since it is likely to be affected by migrants' remittances (Acosta, 2006).

<sup>2</sup> There are two schemes of basic health coverage in Morocco (adopted on 2002), the first provides basic compulsory health insurance for economically active persons and persons receiving pensions from the central and local authorities, public-sector agencies and the private sector, and the second is a medical assistance scheme for persons whose circumstances preclude them from joining the first scheme. In 2005, the Moroccan Government has begun with the implementation of the first scheme, while the second was launched on 2011.

<sup>3</sup> This variable measures the productive capital or the monetary resources available to households. This is a form of labour security that can refer to the extent to which an individual has security in the use of their labour potential as an asset (Moser and Felton, 2007).

<sup>4</sup> Human Development Index communal is measured by three elements: a) Health situation measured through the infant mortality rate, the number of infant deaths per 1000 live births during the 2004 Census year; b) Education level measured by an indicator combining for two-thirds, the literacy rate of people aged 10 and over and, for one third, the enrolment rate of those aged 7-12 years; c) The average annual expenditure per year and per person (HCP, 2004).

### 3. Empirical strategy

Researchers interested in adjusting estimates of remittances effects utilize a variety of techniques. The most frequently employed technique is to use a standard regression analysis in which the remittances effects are controlled by including the remittance receipt as explanatory variable. About their effects on education and child labor, some authors have applied a probit model (Kandel, 2003), which is especially appropriate for dichotomous data. Others have carried out Ordinary least squares method (Gang et al., 2011; McKenzie and Rapoport, 2006, 2011) which is designed specifically for continuous dependent variables. In reality, the latter method is particularly inappropriate for education variable because there are some peaks at specified level of education, which would violate the linearity assumption. In this study, the effect of remittances on investment in children's human capital is estimated via a probit regression approach. We start by estimating a child education equation in order to investigate the main determinants of children's education demand. Our sample provides: (a) an indicator of the current enrolment, (b) an indicator of the dropout, and (c) an indicator of the child illiteracy in the country. Hence, we consider three educational attainment indicators and children mentioned above: (1) those that attend school at the time of the survey, (2) those that dropped out of school, and (3) those that never been enrolled<sup>5</sup>. We will then identify three binary dependant variables: school attenders, school dropouts and non-school attenders. On the basis of such variables, three separate probit regressions are employed while trying to estimate the main determinants of child education in Morocco. To test, whether remittances sent by international migrants enable children to stop working, we consider a dichotomous dependant variable indicating whether child *i* supplies any kind of work, i.e., he/she participates in income-generating activities, either in household farms or businesses or as wage employees.

Our core equation is:

$$E_i^* = \beta_0 + \beta_1 X_i + \beta_2 C_i + \beta_3 REM_i + u_i \quad (1)$$

where  $E_i^*$  is a measure of time allocation of child *i*. The dependent variable in each probit is equal to 1 if  $E_i^* > 0$  and to zero otherwise.  $X_i$  is a vector of child and household

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<sup>5</sup> We use the dichotomous variable which is assigned the value 1 if the child never attends school and 0 otherwise.

characteristics typically affecting child labor participation and education, including age, gender of both the child and the household head, mother' education, household size, a dummy for rural area, and household living conditions.  $C_i$  represents community characteristics including the ICDH,  $REM_i$  represents the amount of yearly remittances received by the receiving households (the sample also includes non-recipient households), and  $u_i$  is a random error.

It may be important here to mention that a number of studies have raised the issue of the endogeneity of migrants' remittances (McKenzie and Rapoport, 2011; Gang et al., 2011, among others). The reverse causation from child educational level to the international remittances may be taking place. The receipt of international remittances could also be related to unobserved determinants of staying at school such negative income shocks which could prevent children from attending school, and at the same time can lead to an increase in household remittance receipts to partially mitigate the shortfall (Acosta, 2006). One way of accounting for possible endogeneity of this variable is to use an instrumental variables (IV) regression. Exogeneity testing of remittances is carried out through the Rivers-Vuong approach (1988) for the Probit model. In our study, plausible instruments that would enable us to use some technique, such as instrumental variables, to control for determinants of child labor and education is the "transaction costs of transfer" which indicates the most expansive channel for sending money using mainly by Moroccan migrants; it takes the value 1 if the migrants reported having heavily used the most expensive money transfer channel (Western union and MoneyGram), and zero otherwise. This instrumental variable for remittances has been widely used in previous studies including Calero et al. (2008).

#### **4. Results**

The results of the empirical analysis are divided into two sub-sections. In the first, the analysis is conducted to explore two main questions: (1) Is there any evidence that the remittances affect educational and labor outcomes? And what are the main factors that influence these outcomes? The second sub-section proposes a gender analysis of child schooling in Morocco and look carefully at the gender inequalities in schooling. The impact of remittances on investment in children's human capital is estimated by means

of IV probit. For both educational attainment and economic work, the validity of the instrument was not rejected and our first stage F-statistics range between 6.17 and 12.88. The endogeneity tests are reported at the bottom of each of the tables. In fact, remittances variable does not seem to be endogenous in all regressions. For example, it appears exogenous in the models explaining the probabilities of working and combining work and school. Tables 2&3 present the estimation results for the three models of schooling and the model of child labor, respectively.

#### **4.1. Child labor and schooling outcomes**

Table 2 reports the results of the probit model for different schooling outcomes. Several interesting results emerge from our analysis. First of all, remittances seem to have a positive effect on the three educational attainment indicators studied. More precisely, children in remittance-receiving households are more likely to attend school and less likely to drop out of school compared with those in non-receiving households. Some studies that find positive impact of receiving remittances on school attendance and retention are Acosta (2006) and Cox and Ureta (2003). Further, migrants' remittances are significant for the children without access to education (i.e., non-school attenders variable). These findings support the growing view that remittances can help increase the level of investment in human capital in remittance-receiving countries.

#### **Insert table 2 here**

As expected, the child's age matters a lot. Accurately, the probability of going to school increases between the ages 6 and 10 and declines thereafter (statistical significance of age squared variable). As a child gets older (above age 10 years), she/he is less likely to continue schooling. It is interesting to note, though, that children who change their decision about schooling will drop out at a later age (Jonhson and Kyle, 2001). Our results related to non-school attenders variable also show that as a child's age increased, she/he is more likely to be out of school.

We also find evidence to support gender differences in education. Boys are more likely to attend school and less likely to never been enrolled. These results are consistent with

the national statistics, which show that literacy rates are much higher for girls than boys. The gender differentials in educational investments may be due to higher returns, on average, to education for males (males tend to earn more than females). Further, households not invest in girls because parental preferences that favour sons or because girls will marry into other families<sup>6</sup>.

Our results also point out how the living conditions of the household can influence child education. As expected, mothers' education has a negative (positive) and statistically significant effect on the non-school attenders (school attenders) variable. At the same time, household living conditions have a positive effect on school attendance and a negative effect on dropout of school, as wealthy families can invest more in their children's education. This suggests that parental economic class plays a key role in children's development (Acosta, 2006; McKenzie and Rapoport, 2006, 2011).

Looking at the other characteristics of households, we find that the household size has a negative effect on dropout of school. We would expect this variable to affect the hazard of school dropout for males and females differently: the gender bias against the female child implies that because of budget constraints the households tend to prefer sending their sons to school than daughters; in this context, the household size effect can be slightly more pronounced for females than males. Accordingly, Brown et al. (2001) argue that "once additional children are born, diversification in the investment in children can be accomplished by putting some children to work exclusively and some in school exclusively. If this is the case, the presence of additional siblings should have the twin effects of increasing the probability of full-time schooling and increasing the probability of full-time work."

Finally, children whose families live in rich communes characterized by their high level of human development are more likely to attend school.

To estimate the impact of remittances on human capital investments we have also modeled the probability that a child participates in income generating activities and/or combines work and school. Results are reported on Table 3. Overall, findings are

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<sup>6</sup> In the case of Pakistan, Qureshi (2012) has found that "the returns to schooling are higher for females than for males at all levels of education - primary, secondary and tertiary and yet parents still invest less in educational development of females as compared to males. One possible explanation for this trend could be that even though the private rate of return to time spent in school than in the labour market is higher for a female compared to male but the part of return that goes to parents is much lower for daughters than sons in Pakistan."

consistent with other studies assuming that additional income derived from international migration plays an important role in reducing child labor in origin communities (Acosta, 2006; Mansuri, 2006; Gang et al. 2011). We find that remittances reduce the probability of children participating in the labor market. Since in most cases, migrants' remittances are much larger in magnitude, recipient households are more able to decrease their need for a child's earnings.

There is some suggestive evidence that unlike schooling, there are no gender differentials in labor market participation. However, with regards to the determinants of combining work and schooling, we find that they differ systematically along gender. Thus, boys are more likely to combine work and schooling than girls.

### **Insert table 3 here**

Our results show that the age of children in years is statistically significant. As their age increases, they will be more likely to work. In others words, as the child ages and becomes more productive, the opportunity cost of education rises, making work more attractive. There is also evidence of a significant positive correlation between the probability of combining work and study and the child age.

As expected, the higher level of education of mothers decreases the supply of child labor. In addition, male children in larger families are less likely to combine work and schooling. Interestingly, the economic class of the household impacts negatively the child labor supply. This result is consistent with the previously quoted finding that wealthier households in developing countries experience lower levels of child labor supply. As would be predicted by Basu and Van's (1998) models, parents withdraw their children from the labor force as soon as they can afford to do so. However, and somewhat surprisingly, for child labor regression, the household size variable does not enter this regression significantly.

Finally, our estimates indicate that children in rural areas are more likely to be active and to combine work and schooling than their counterparts in urban areas. This expected result can be attributed to the fact that work is more prevalent and schooling attainment is lower in rural areas because particularly of the agricultural labor opportunities and the imperfect markets.

## 4.2. Extensions and further implications of the estimation results

Child gender is significant in all three models which explain child schooling. Hence, the main determinants for male and female child schooling should be considered separately. Table 4 presents the results by child's gender. We find that for boys, as well as for girls, belonging to a remittance-recipient household seems to have a significant effect on school attendance and school dropout. However, while the migrants' remittances effect on school attendance and dropout are almost the same across males and females, there is a stronger difference if we consider the never-enrolled regression. In this case, we find remittances to be associated with significantly lower level of no schooling for girls. As consequent, we can view international remittances as a potential pathway by which families can increase educational opportunities, especially for female children.

**Insert table 4 here**

Looking at other determinants of school attendance, they all play a role in the two models (boys and girls) and three facts stand out. First, mothers' education and wealth proxies both have a positive effect on attending school as expected. Second, child's age has a positive effect on child education, and third, the regional characteristics have a positive effect on enrolment rate. Higher ICDH rate signifies greater economic opportunities and should mitigate then dropout risks. However, our results reveal that female children of households with low socio-economic status who live in rural areas and in community with higher ICDH are more likely to dropout even if the dropout means that these female children have already started school. It can be well seen at Table 4 that the rural variable has only a positive effect on child dropout of females. This is in line with the hypothesis of using rural area as a proxy for availability of educational infrastructure. In rural area there much easier access to education for boys compared to girls (Qureshi, 2012). Interestingly, child age is significant only for boys, suggesting that the probability of dropping out falls as child age increases. In our sample, the dropout rate for girls relative to boys is particularly high (8.6 percent compared to 5.67 for boys). In our sample, children on school age begin dropping out seriously as early as age 10: 6% of school dropouts, compared to 9% at the age of 11

and 17.5% at the age of 12. Finally, we also find a little evidence of gender bias in educational investments, indicating that the gender of the household head is insignificant across all the models except for girls. Girls are more likely to drop out of school than boys if the households are headed by women. We can imagine that this gender gap in school attendance could be exacerbated when the households face resource constraints. This finding is similar to the general belief that female-headed households are more likely to experience school dropout. The annual report of FAO (2011) provides a first glimpse of this result. Female headed households could be over-represented among the poor. Furthermore, female share of the agricultural labor force in the Near East and North Africa countries appears to have risen substantially, from 30 percent in 1980 to almost 45 percent. In these countries, there were also significant differences in male and female employment and wages.

Looking at other determinants of no schooling, they all play the same role in the two models (boys and girls). However, the positive effect of male head household is significant for girls only, providing strong support for greater gender bias by fathers than mothers.

## **5. Conclusion**

In this paper, we investigate the determinants of household investments in children's human capital in Morocco. We estimate the effect of international remittances on mitigating children's withdrawal from school and increased participation in work activities. Investment in human capital plays an important role in a country's economic development. In developing countries especially, child labor and poverty are considered to be the main impediments to the child education and there is broad consensus that the demand-side support that can improve child education is as important as the supply-side support such as school characteristics. In this sense, cash transfers can be a tangible resource in human capital investment especially when the financial constraints are a main obstacle to child education. Although economic research exists on financial transfers made by international migrants and child education and labor, the literatures overlap only in rare and exceptional cases. Therefore, there is a pressing need to extend academic knowledge on the impact of migrants' remittances on children in developing



countries in order to achieve a basic understanding of the scope and dimensions of the phenomenon. This paper sheds light on the impact of international remittances in Moroccan households. We use a national living standards measurement survey (LSMS 2006-07). Our study provides different insights by showing that migrants' remittances can influence the current enrolment, the child illiteracy, the dropout and the child activity in the country. More precisely, we find that the remittance effect is positive and significant for all educational attainment indicators. For instance, children in remittance-receiving households are more likely to attend school and less likely to drop out of school. Further, our estimates indicate that international remittances reduce labor market activity of children. These findings support the growing view that remittances can help increase the level of investment in human capital in remittance-receiving countries.

Our estimates suggest that the effect related to school attendance is significant for children growing up in wealthy families, younger children, and boys. However, unlike schooling, there are no gender differentials in labor market participation. We also find that specific factors, such as mother's education, economic class of household and areas of residence of the household can influence child work.

When we consider the main determinants for male and female child education separately, our findings confirm that for both boys and girls, belonging to a remittance-receipt household seems to have a significant effect on school attendance and school dropout. With the model used data from children who are school non-attenders, we find migrants' remittances reduce the level of no schooling for girls. Thus, we can view international remittances as a potential pathway by which families can increase educational opportunities, especially for female children. They could lead to higher investments in schooling for girls and a reduction in gender inequalities in access to schooling with all its attendant societal benefits.

Overall, these results provide evidence of an undocumented effect of migrants' remittances on household investment in children's human capital in Morocco. For instance, our findings seem consistent with an important role for liquidity constraints in the child time allocation decisions (Calero et al. 2008; Yang, 2008). Therefore, it seems that receiving large cash transfers can weaken these cash constraints, and hence children work less and attend school more. Further, because migrants' remittances are a

component of the income of recipient household, this paper contributes to our general understanding of how additional income can affect child outcomes in other developing countries. A simple banning child from working or making school attendance compulsory without improving economic conditions of households is likely to leave them worse off. Thus, income subsidies could help to reduce child labor and encourage school attendance. At the same time, gender differences in education must be taken into account when developing policies and strategies to improve educational outcomes. Our paper also sheds light on the interest of having policies, to reduce the remittances costs for example, which can facilitate and stimulate migrants' remittances to developing countries.

## References

- Acosta P. 2006. Labor supply, school attendance and remittances from international migration: the case of El Salvador. World Bank Working Paper n° 3903, Washington, DC.
- Adams R.H, Cuecuecha A. 2010. Remittances, household expenditure and investment in Guatemala. *World Development* 38 (11): 1626-1641
- Basu K, Van P.H. 1998. The economics of child labor. *The American Economic Review* 88: 412-427.
- Bouoiyour J, Miftah A. 2014. Household welfare, international migration and children time allocation in rural Morocco. *Journal of Economic Development* 39 (2).
- Brown D.K, Deardorff A.V, Stern R.M. 2001. Child Labor: Theory, Evidence, and Policy. Working Papers, Research Seminar in International Economics, University of Michigan.
- Calero C, Bedi A.S, Sparrow R. 2008. Remittances, liquidity constraints and human capital investments in Ecuador. *World Development* Vol. 37, No. 6, pp. 1143–1154.
- Chami R, Fullenkamp C, Jahjah S. 2003. Are immigrant remittance flows a source of capital for development? IMF working paper 03/189, International Monetary Fund, Washington, DC.
- Cigno A, Rosati F.C. 2000. Why do Indian children work, and is it bad for them? *Pacific Economic Review* 7: 65-84.

- Cox E.A, Ureta M. 2003. International migration, remittances, and schooling: evidence from El Salvador. *Journal of Development Economics* 72: 429-461.
- Dahl G.B, Lochner L. 2012. The impact of family income on child achievement: Evidence from the Earned Income Tax Credit. IZA Discussion Paper no. 6613.
- Edmonds E. 2006 Child labor and schooling responses to anticipated income in South Africa. *Journal of Development Economics* 81(2): 386-414.
- Ersado L. 2003. Child labor and schooling decisions in urban and rural areas: Comparative evidence from Nepal, Peru, and Zimbabwe. *World Development* 33: 455-480.
- FAO. 2011. *The State of Food and Agriculture 2010-2011*. Rome.
- Gang I.N, Dimova R, Epstein G.S. 2011. Migration, Remittances, and Child Labor. IZA Discussion Paper No. 5641
- Glewwe P, Jacoby H. 1994. Student achievement and schooling choice in low-income countries evidence from Ghana. *Journal of Human Resources* 42: 251-275.
- Hanson G.H, Woodruff C. 2003. Emigration and educational attainment in Mexico. Mimeo, University of California.
- High Commission for Planning. 2004. *Pauvreté, développement humain et développement social au Maroc*. Rabat: Kingdom of Morocco.
- Jonhson R, Kyle S. 2001. *The determinants of girls' educational enrolment in Ghana*. Cornell University, New York.
- Qureshi M.G. 2012. The gender differences in school enrolment and returns to education in Pakistan. PIDE Working Papers, no. 84.
- Kandel W. 2003. The impact of U.S. migration on Mexican children's educational attainment. In *Education, Family and Population Dynamics*, edited by M. Cosio, R. Marcoux, M. Pilon and A. Quesnel. Paris:CICRED, pp 305-28.
- Liu E.M and Leight J. 2015. Maternal bargaining power, parental compensation and non-cognitive skills in rural China. Paper is available at:  
[http://www.class.uh.edu/Faculty/emliu/noncog/Leight\\_Liu\\_Non\\_Cog.pdf](http://www.class.uh.edu/Faculty/emliu/noncog/Leight_Liu_Non_Cog.pdf).
- Lopez-Cordova J.E. 2006. Globalization, migration and development: The role of Mexican migrant remittances. INTAL - ITD Working Papers no. 20, Inter-American Development Bank, Washington, DC.

- Mansuri G. 2006. Migration, school attainment, and child labor: evidence from rural Pakistan. Policy Research Working Paper Series no. 3945, Washington, DC.
- McKenzie D, Rapoport H. 2006. Migration and education inequality in rural Mexico. *Integration and Trade Journal* 27: 135-158.
- McKenzie D, Rapoport H. 2011. Can migration reduce educational attainment Evidence from Mexico. *Journal of Population Economics* 24: 1331-1358.
- Moser C, Felton A. 2007. The construction of an Asset Index measuring asset accumulation in Ecuador. CPRC Working Paper no. 87.
- Rivers D, Vuong Q.H (1988) Limited information estimators and exogeneity simultaneous probit models. *Journal of Econometrics* 39: 347-66.
- Yang D. 2008. International migration, remittances and household investment: Evidence from Philippine migrants' exchange rate shocks. *Economic Journal, Royal Economic Society* 528: 591-630.

Table 1. Summary Statistics of Non-Remittance and Remittance-Receiving Households

	All households (N=7,062)		Remittance-receiving households (n1=1,079)		Non-receiving households (n2= 5,983)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Average household expenditure	56887	54560	72756	59171	54025	53190
Educational expenditure	2096.0	5782.5	2899.4	5749.0	1993.0	5779.2
Household size	5.144	2.433	4.942	2.438	5.181	2.430
Age of household head	51.64	14.00	55.93	15.10	50.87	13.65
Household head is a male	0.824	0.380	0.736	0.441	0.841	0.366
Mothers' education						
Never enrolled	0.746	0.434	0.676	0.468	0.755	0.429
Primary and middle secondary	0.190	0.392	0.246	0.431	0.183	0.387
education						
High secondary education	0.037	0.190	0.050	0.219	0.036	0.185
Higher education	0.025	0.156	0.026	0.159	0.024	0.155
Household lives in rural area	0.395	0.489	0.325	0.4687	0.407	0.491
Characteristics of children in the						
age-group 6-14 years						
Male	0.508	0.499	0.491	0.5002	0.510	0.499
Age	10.17	2.578	10.27	2.6295	10.15	2.571

Table 2. Probit estimates for the Probabilities of attending and leaving School

	School attenders	School Dropout $\alpha$	Out of school
Migrants' remittances	.027 (2.91)	-.309 (-1.84)	-.030 (-2.43)
Boys	.481 (10.18)	-.569 (-5.27)	-.547 (-9.36)
Age of child	1.12 (13.77)	.276 (1.09)	-1.19 (-12.43)
Age of child squared	-.059 (-15.07)	.000 (0.04)	.056 (11.81)
Household head male	-.058 (-0.75)	-.200 (-1.00)	.0794 (0.78)
Mother's education			
Primary and middle secondary education	.231 (2.85)	.0369 (0.13)	-.250 (-2.18)
High secondary education	.015 (0.09)	.5184 (0.94)	-.016 (-0.06)
Higher education	.969 (2.47)	()	()
Rural	-.086 (-0.93)	.2456 (0.90)	-.020 (-0.19)
Household size	-.007 (-0.87)	-.028 (-1.68)	.0133 (1.39)
Access to electricity	.399 (7.48)	.1801 (1.11)	-.525 (-8.32)
Internet access	.193 (1.65)	-.230 (-0.84)	-.137 (-0.97)
Water access	.288 (3.89)	-.497 (-2.20)	-.105 (-1.08)
Access to essential health care services	.622 (5.29)	-1.07 (-3.15)	-.619 (-3.45)
Icdh	3.42 (8.33)	1.210 (0.68)	-4.02 (-8.22)
Constant	-6.21	-4.22	7.292
Total observations	6476	1534	6314
R2	0.2606	0.2736	0.2594

Notes:  $\alpha$  Predicted log remittances using “the transaction costs of transfer” as the identifying instrument. The t-statistics are given in parentheses beneath the coefficients. Due to multicollinearity, we leave out a number of control variables that have been used in the first regression such as mothers with high level of education.

Table 3. Probit estimates for the probabilities of working and combining work and school, Boys & Girls

	Child labor	Combining school and work		
		All	Boys	Girls
Boys	.0360 (0.63)	.2883 (3.01)		
Migrants' remittances	-.0377 (-2.81)	-.0345 (-1.85)	-.0154 (-0.69)	-.0868 (-1.89)
Age of child	.39967 (3.71)	.6825 (3.88)	.70650 (3.21)	.78428 (2.74)
Age of child squared	-.0082 (-1.61)	-.0283 (-3.28)	-.0287 (-2.65)	-.0347 (-2.43)
Household head male	-.0323 (-0.33)	-.2088 (-1.53)	-.0740 (-0.40)	-.3820 (-2.00)
Mother's education				
Primary and middle secondary education	-.1098 (-0.97)	.02118 (0.13)	-.2927 (-1.03)	.31392 (1.78)
High secondary education	.61909 (2.99)	.47563 (1.16)	.90142 (1.79)	()
Higher education	()	()	()	()
Rural	.26908 (2.42)	.75692 (4.34)	.97106 (3.17)	.62960 (3.59)
Household size	-.0109 (-1.12)	-.0375 (-2.41)	-.0494 (-2.21)	-.0186 (-0.92)
Access to electricity	-.1455 (-2.30)	.10153 (1.00)	.08698 (0.70)	.13993 (0.76)
Internet access	.12804 (1.12)	.39967 (2.76)	.52802 (2.89)	.11945 (0.45)
Water access	-.4557 (-4.79)	-.4767 (-3.53)	-.4909 (-2.17)	-.5165 (-4.11)
Access to essential health care services	-.8215 (-4.38)	-.8712 (-2.38)	()	-.3270 (-0.89)
Icdh	-4.3440 (-8.44)	-2.402 (-3.37)	-2.607 (-2.80)	-1.719 (-1.67)
Constant	-2.068	-4.674	-4.710	-5.281
Total observations	6314	5339	2357	2368
R2	0.301	0.245	0.231	0.195

Notes: The t-statistics are given in parentheses beneath the coefficients. Due to multicollinearity, we leave out a number of control variables that have been used in the first regression such as mothers with high level of education.

Table 4. Probit estimates for the Probabilities of attending and leaving School, Boys & girls

	Boys			Girls		
	School attenders	School Dropout	Out of school	School attenders	School Dropout $\boxtimes$	Out of school
Migrants' remittances	.033 (2.29)	-.0372 (-2.01)	-.036 (-1.56)	.0231 (1.80)	-.7024 (-2.49)	-.0273 (-1.74)
Age of child	1.12 (9.53)	.4490 (2.21)	-1.39 (-8.71)	1.11 (10.00)	-.0416 (-0.13)	-1.07 (-8.85)
Age of child squared	-.059 (-10.19)	-.0073 (-0.79)	.0645 (7.97)	-.061 (-11.14)	.0143 (0.98)	.0519 (8.62)
Household head male	.0712 (0.64)	.0434 (0.34)	-.207 (-1.29)	-.1529 (-1.43)	-.539 (-1.83)	.2300 (1.82)
Mother's education						
Primary and middle secondary education	.2209 (1.87)	-.1151 (-0.81)	-.322 (-1.65)	.2336 (2.10)	.3354 (0.58)	-.216 (-1.53)
High secondary education	.0123 (0.06)	.2205 (0.85)	()	.0477 (0.17)	()	.2112 (0.64)
Higher education	()	()	()	.8324 (1.94)	()	()
Rural	.0444 (0.33)	-.044 (-0.24)	-.007 (-0.04)	-.1834 (-1.42)	.8978 (2.22)	-.0612 (-0.41)
Household size	-.0111 (-0.96)	-.007 (-0.46)	.0234 (1.47)	-.0015 (-0.14)	.0030 (0.14)	.0050 (0.42)
Access to electricity	.4171 (5.39)	-.1187 (-1.17)	-.663 (-6.47)	.3913 (5.31)	.1317 (0.65)	-.472 (-5.79)
Internet access	.1478 (0.88)	-.1900 (-0.90)	.0333 (0.14)	.2322 (1.43)	-.1850 (-0.51)	-.2762 (-1.67)
Water access	.1974 (1.91)	-.386 (-2.91)	.0860 (0.56)	.3352 (3.25)	.1105 (0.33)	-.2073 (-1.66)
Access to essential health care services	.5227 (3.33)	-.5102 (-2.39)	-.773 (-2.81)	.6921 (4.00)	-1.05 (-2.75)	-.548 (-2.40)
Icdh	3.229 (5.60)	-2.38 (-3.23)	-3.45 (-4.70)	3.690 (6.33)	4.818 (1.86)	-4.51 (-6.90)
Constant	-6.015	-3.984	7.781	-6.148	-4.475	6.819
Total observations	3218	3218	3094	3186	721	3096
R2	0.1979	0.2408	0.2710	0.2876	0.2618	0.2360

Notes:  $\boxtimes$  Predicted log remittances using “the transaction costs of transfer” as the identifying instrument. The t-statistics are given in parentheses beneath the coefficients. Due to multicollinearity, we leave out a number of control variables that have been used in the first regression such as mothers with high level of education.