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Abstract

We study the roles that migration and remittances play in the human capital formation of children in Egypt. Our estimations reveal a significant association between remittances and human capital formation: the higher the probability of receipt of remittances, the higher the probability of school enrollment, and the older the age at which children enter the labor force. Although, with regard to the likelihood of school enrollment and the age of the first participation in the labor force, the family disruption effect of migration dominates the income effect of remittances, the likelihood of labor force participation decreases even in households from which both parents migrated.

Keywords: Migration; Remittances; Human capital formation; Child labor; Egypt

JEL Classification: F24; I21; J2

1. Introduction

In the past three or so decades, countries have become significantly integrated, not only through international trade and investment but also through the movement of people. According to estimates of the World Bank and the United Nations, currently more than 215 million people live outside their countries of birth, typically sending home remittances, the effect of which, especially on source countries' development, has become increasingly important. This study, thus, scrutinizes the role of such migration and remittances in human capital formation of children and in child labor. We focus on Egyptian children that are left behind by a migrant parent, or by both parents.

There are different channels through which migration of a household member affects non-migrant household members' human capital formation. Different channels may generate different incentives for schooling/child labor, especially depending on household organization and the economic environment. Remittances have a positive income effect, especially if they overcompensate for the loss of income due to migration, and may, thus, increase the household's consumption of normal goods including education, thereby leading to an increase in the demand for child schooling. Remittances may also have a detrimental effect if they signal that unskilled work can be rewarding, and additional income can be earned independently of schooling (Boucher et al., 2009). Migration may lead to disruption and to the restructuring of roles in the household, increasing non-migrant household members' domestic workload, which increases the opportunity cost of their schooling, decreases the time allocated to schooling, and impairs school performance.

The plan of the remainder of this paper is as follows. In the next section, we briefly discuss about Egyptian migration and remittances; we delineate the different channels through which migration affects human capital formation; and we list conditions under which remittances foster human capital formation in remittance-receiving countries and households. In Section 3, we introduce our data, and present descriptive statistics. In Section 4, we delineate our methodology. In Section 5, we present our estimation results. Section 6 concludes.

2. Egyptian remittances and human capital formation

Egypt is a prominent migrant-sending and remittance-receiving country in the world at large, and in the Middle East and North Africa (MENA) region in particular. According to estimates of the Egyptian Ministry of Foreign Affairs, in 2008, the Egyptian migrant population was 6.5 million, corresponding to about 8 per cent of the population of Egypt. As to destinations, 74 per cent of the

Egyptian migrants are in Arab countries, 12.2 per cent are in Europe, 12.1 per cent are in North America, and 1.6 per cent are in Australia (Nassar, 2011). Corresponding to the distribution of the Egyptian migrant population across different world regions, Arab countries contribute the largest share in total Egyptian remittances: in 2008, US$ 4.45 billion (more than half) were transferred from Arab countries (Table 1).

[Table 1 about here]

As discussed later, oil-rich Arab countries' demand for labor significantly affects Egyptian migration and remittances, and since the early 2000s, with rising oil prices, migration from Egypt to oil-rich Arab countries, and Egyptian remittances steadily increased, especially until the financial crisis of 2008 (Figure 1).

[Figure 1 about here]

In 2008, remittance flows to Egypt were about US$ 8.6 billion - nearly three times as high as their value three decades earlier - comparable to net FDI inflows (US$ 9.5 billion), and exceeding net ODA received (US$ 1.3 billion), in that same year. Although remittance flows were negatively affected by the financial crisis, there has been a quick recovery. According to estimates of the Central Bank of Egypt, remittances sent by Egyptian migrants in fiscal year 2010/11 broke records, amounting to US$ 12.6 billion (Abdelfattah, 2011).

In 1985-2010, the average share of remittances in Egyptian GDP has been 6 per cent. The average value of annual remittances per capita in 1985-2009 has been around US$ 61.4 - it was US$ 105 in 2008 - which is significant at the household level, especially when the average number of family members per migrant and the average per capita income in Egypt are taken into account (El-Sakka, 2010).

2.1 Theoretical considerations

The theoretical literature on international migration presents different explanations as to why people migrate. Our study is mostly related to the "New Economics of Labor Migration" which, inter alia, argues that market failures lead people to migrate, and that households (not individuals) are the decision-makers, even though the migrating unit is an individual (Stark, 1993).[1] According to the New

[1] For a discussion of different migration approaches, see, for example, Stark (1984), Stark and Bloom (1985), Katz and Stark (1986), Massey (1990), Stark (1993), and Massey et al. (1993; 1994).

Economics of Labor Migration, the act of migration is an implicit contract between members of a household, especially to share costs and benefits.[2] The idea is simple: household members co-finance migration costs for one of the family members in return for a cut of future income gains. Remittances are at the core of the New Economics of Labor Migration, constituting an important means by which migrants share the returns to migration with non-migrant household members.

Remittances are an important source of income for the recipient households,[3] and if the loss of income due to migration of a household member - typically the main breadwinner - is overcompensated by such returns to migration, then migration can alleviate resource constraints of the recipient household, and can generate investment and boost consumption. Even if remittances are earmarked for a specific purpose, such as loan repayment, they increase fungible household income and, thus, help the recipient household buy more of all normal goods, including health and education (Stark, 1993; McKenzie and Sasin, 2007). By the same token, remittances may raise household members' reservation wage, including that of children who are left behind, which may lead to a decrease in labor supply, or they may reduce the need for additional income generated by household members such that young, non-migrant household members can have more time for school. This holds especially when remittances are large enough to loosen budget constraints (Elbadawy and Roushdy, 2010). If, however, remittances are saved to finance a young household member's migration in the future, or are invested in a family-run venture to which young household members are required to provide unskilled work, then remittances may have a detrimental impact on the schooling of children.

As Stark et al. (1997) argue, the decision to invest in education depends also on whether or not the prospect to migrate creates incentives to invest in education. If there is positive selection into migration such that the probability of migrating and that of successful migration increase with education, then remittances that loosen liquidity constraints may have a positive impact on human capital formation. If, however, migration of an unskilled household member leads to expectations that

[2] For instance, in countries in which social security is inadequate, and/or capital markets are not well functioning, or where markets for capital and insurance are non-existent or inaccessible, households use migration as a strategy to overcome capital constraints and diversify economic risks (Stark, 1984; Stark and Bloom, 1985; Katz and Stark, 1986; and Stark, 1993).

[3] In some Egyptian villages, remittances from migrants working in the Gulf countries are the exclusive source of household income.

unskilled work will be rewarding without schooling, then remittances may fail to foster human capital formation, and will hamper schooling (Stark and Byra, 2012).

Family disruption is a channel through which migration may impinge adversely on human capital formation. The absence of a parent may adversely affect school attendance and school performance (Kandel and Kao, 2001). In addition, adolescent children may be called upon to contribute to household income, especially in the short run if and when the loss of income due to migration of a household member is not yet offset by remittances which may take some time to arrive. Also young, non-migrant household members may have less time for school if the restructuring of roles due to parental absence increases their domestic workload such as care-giving (especially if there are younger siblings or elderly people in the household), cleaning, shopping, cooking, and the like.

At the macro level, improving socio-economic institutions, enforcing efficiency and transparency of markets for remittances, and implementing well-designed economic policy measures (assisting migrant households to put remittances to productive use) may help in channeling remittances into human capital formation.

In sum, the overall impact of remittances on human capital formation is determined by the interplay of factors both at the household level and at the macro level. A positive association between remittances and human capital formation is likely to arise if a positive income effect of remittances dominates a negative family disruption effect of migration.

2.2 Empirical findings

Several studies sought to identify the impact of migration on human capital outcomes, by looking at how remittances are spent by recipient households. In general, the evidence is mixed; several studies find that remittances are used mainly to finance investment that is not productive, or rather are spent on conspicuous consumption, while other studies find that remittances are spent on education, health, or investment goods (Rapoport and Docquier, 2006; Yang, 2008; Boucher et al., 2009; Schapiro, 2009; Adams and Cuecuecha, 2010; Adams Jr., 2011; and Ratha et al., 2011).

As shown in Table 2, studies find a significant positive impact of remittances on average years of schooling, on school attendance, on school enrollment, and on the highest grade completed, although the evidence is mixed for different genders, and for different age groups. In addition, studies find that through the income channel, remittances raise non-migrant household members' reservation

wage, and reduce the need for additional income generated by young household members (Mansuri, 2006; Yang, 2008; Calero et al., 2009; Acosta, 2011a,b; and Alcaraz et al., 2012); or that family disruption caused by migration is significant, and impinges adversely on human capital formation (Cuecuecha, 2009; Antman, 2011; McKenzie and Rapoport, 2011; and Robles and Oropesa, 2011). There are, however, only a few studies that look at both the family disruption effect of migration and the income effect of remittances.[4] We focus on these two effects (the migration disabling and remittances enabling effects) in order to unearth the joint remittances-migration impact on human capital formation.

As for Egypt, to our knowledge the study by Elbadawy and Roushdy (2010) is the only one that looks at the impacts of migration and remittances on human capital formation.[5] This study focuses mainly on the remittances enabling effect,[6] and finds that remittances positively affect school attendance, and reduce the likelihood of engaging in paid work. Our study is closely related to the study of Elbadawy and Roushdy (2010) in that we focus on Egypt, and draw upon data from the same source. We employ, however, more refined estimation techniques, including an instrumental variable approach, where we incorporate a novel instrument so as to deal with potential endogeneity and self-selection problems. We pit against each other the two effects (the enabling and the disruptive ones) in order to uncover the roles of each and of their joint impact. Our estimation results point to a significant association between remittances and human capital formation in Egypt. We find that the higher the probability of receiving remittances, the higher the probability of school enrollment. Although the negative family disruption effect of migration seems to dominate the positive effect of remittances on the likelihood of school enrollment, the likelihood of labor force participation decreases even in households from which both parents are absent.

[4] Cuecuecha (2009) and Amuedo-Dorantes et al. (2010) study the joint impact of migration and remittances on human capital formation, and find that the overall effect is positive and significant. Cuecuecha (2009), however, finds that the overall effect is positive only in the case of migrants who left their households in less than five years time.

[5] Binzel and Assaad (2008; 2011) address similar questions, but they focus on adolescent Egyptians.

[6] Elbadawy and Roushdy (2010) address the family disruption effect of migration by including in the estimation a binary variable that indicates whether or not the child lives in a household that has a migrant member who migrated within the last five years.

3. Data and descriptive statistics

We extract our data from a nationally-representative survey, the Egypt Labor Market Panel survey (ELMPS), which is the first fully-fledged panel survey of this scope in Egypt. At first, the survey - initially called the Egypt Labor Market survey (ELMS) - included 4,816 households, representative at the national level in 1998. In 2004, 2,500 households were added, as a refresher sample. Finally, in 2006 the number of households was increased to 8,349.[7] In particular, 72 per cent of the individuals that were interviewed in 1998 were successfully re-interviewed in 2006, yielding a panel that can be used for longitudinal analysis.

Both the ELMS'98 and the ELMPS'06 provide information on employment, job characteristics, mobility, and earnings, as well as on socio-economic and demographic characteristics of the households. The ELMPS'06 is of particular interest to us because it includes information on international migration, education, and employment history of household members, as well as on current migrant members of the households and their remittances. In particular, the survey provides information on whether or not a household receives remittances from a migrant member, and the amount of remittances received. In our analysis, we define a migrant household as a household that has at least one member currently living abroad, and we define a remittance-receiving household as a household with at least one member receiving any cash/benefit in kind from another member of the same household living abroad. In our dataset, we have 1,686 migrant households, 1,252 of which are remittance-receiving households.[8]

4. Methodology

Endogeneity and self-selection problems are common in this type of inquiry: it is likely that households are not randomly selected into migration; or because of simultaneity of household decisions, measurement errors, and omitted variable or reverse causality bias, estimation results will be biased. A concern is that there may be systematic differences - especially in terms of socio-economic and demographic characteristics - between migrant and non-migrant households, and/or between migrant households receiving remittances and those receiving no remittances. Roushdy et al.

[7] For more information on the ELMS and ELMPS, see Assaad (2002a,b), and Barsoum (2006).

[8] Egyptian migrant households that receive no remittances are likely to have a relatively young migrant member who is unmarried, and who migrated in order to save so as to finance his marriage (Binzel and Assaad, 2008; 2011).

(2008) employ ELMPS'06 and provide descriptive evidence suggesting that there is self-selection into migration and remittances (also) in the case of Egypt.[9]

A common approach to deal with such endogeneity and selection bias problems is to construct an instrumental variable, which is also the approach taken in this paper. That said, finding an exogenous instrumental variable that can identify the casual relationship between remittances and schooling outcomes is not easy. We address the self-selection problem by focusing on the sample of households that have a member living abroad (migrant households) and we scrutinize the impact of remittances on the human capital formation of Egyptian children of school age. As the sample is comprised of migrant households, the family disruption channel may already be present. The question is whether or not this is overcompensated by the remittance channel. To this end, we use all the relevant information available for child *i* (of school age), in region *r*, where the child is a member of household *h*, of whom member *j* (the migrant member) is abroad, and thus we employ the following specification:

$$Outcome = \beta_0 + \beta_1 Remittances + \alpha_1 X_i + \alpha_2 Y_h + \alpha_3 Z_h + \alpha_4 Q_j + u_{ihr},$$

where X_i is a vector of individual characteristics of child *i*, consisting of age, the square of age, gender, the number of siblings, and if any, the number of years repeated in school; Y_h is a vector of parental characteristics, consisting of parents' highest completed level of education, controlled by dummy variables (primary, middle, or secondary education), and the presence of parents in the household, controlled by a binary variable, zero or 1, such that it is equal to 1 if both parents are present in the household; Z_h is a vector of household characteristics, consisting of the number of individuals in the household, of a variable that indicates whether the household is located in a rural area, and of a categorical variable that controls for house ownership; Q_j is a vector of migrant characteristics, consisting of the level of his/her education, and the number of years since his/her last visit, so as to control for the strength of family ties. As for *Remittances*, we use a binary variable such that it is equal to 1 if a household member receives remittances, or zero if it does not; and u_{ihr} is the

[9] Migration from Egypt seems to be selective by education (Assaad, 2010). Egyptians in North America and Europe are more educated than those in Arab countries (Zohry, 2010). More than half of the permanent migrants - especially those who migrated in 2000-2007 - are university graduates, whereas only one quarter of the temporary workers are university graduates (Nassar, 2011).

error term.

To capture the human capital formation effect of migration via the family disruption channel, and to measure the effect of remittances, we also run separate estimations, in which we drop the binary variable that controls for the presence of parents in the household from the vector of parental characteristics, Y_h ; we include a binary variable, *Absenteeism*, zero or 1, such that it is equal to 1 if both parents are absent from the household; and we use an interaction variable, that is, we interact *Remittances* and *Absenteeism*. We do this in order to unearth the effect of remittances on human capital formation in the presence of the disabling effect of migration. We expect the negative family disruption effect to be fleshed out, especially in households from which both parents are absent.

We carry out estimations with three different dependent variables: a binary variable, zero or 1, such that it is equal to 1 if child *i* is currently enrolled in school; a binary variable, zero or 1, such that it is equal to 1 if child *i* has ever worked; and a variable comprised of the age of children entering the labor force. We note that not only do we look at the impact of remittances on the schooling or labor market outcomes of a given child, we also delineate different impacts across genders. We use four different estimation methods: a standard OLS technique; a modified OLS technique with regional fixed effects so as to control for unobserved heterogeneity across different governorates;[10] a modified OLS technique with destination country fixed effects so as to control for unobserved heterogeneity across different host countries;[11] and as already noted, an instrumental variable approach so as to deal with endogeneity and selection bias problems.

A good instrument for successfully addressing the endogeneity problem is one that is sufficiently correlated with migration and/or remittances, and that does not affect the schooling and labor force participation decisions by any means other than through its correlation with migration and/or remittances. In the literature on international migration and remittances, historical migration rates and the share of households with migrants are commonly used as instruments (Table 2). The reason for this stance is that migrant networks that increase the prospect of migration are expected to be uncorrelated with schooling decisions.

We assume that past migration and networks play an important role, especially in the case of

[10] There are 22 governorates in Egypt. We sort households according to their locations, and introduce dummy variables for governorates.

[11] According to the ELMPS'06, Egyptian migrants are scattered across 16 different countries.

migration from Egypt to Europe. However migration from Egypt to Arab countries is managed more directly by regulations, certified migration brokers, and some other intermediaries (Zohry, 2010). Moreover, as already noted, a significant share of Egyptian migrants has been hosted by oil-rich Arab countries (Nassar, 2011), and changes in the stocks of Egyptian migrants, especially those of temporary migrants working in oil-rich Arab countries, crucially affect remittance flows to Egypt (El-Sakka, 2010). Therefore we depart from the received literature and employ a novel instrumental variable, namely, the average oil supply (for the period 2002-2006) in countries hosting Egyptian migrants.

When choosing our instrumental variable, we mainly look at the historical trends, statistical evidence, and stylized facts about Egyptian migration and remittances. Organized migration from Egypt began in the 1930s, and increased significantly in the late 1960s.[12] In the mid-1970s, especially after the 1973 war, rising oil prices led the Arab Gulf countries to demand more Egyptian labor; Egyptian migration substantially increased, and finally reached its peak in the mid-1980s (Zohry, 2010; and Nassar, 2011). In parallel with the declining oil revenues in the second half of the 1980s, Egyptian migration slowed down, and the number of Egyptian migrants declined. In the first half of the 1990s, especially after the Gulf war of 1991 - a period in which Gulf States decided to replace large numbers of Jordanians, Palestinians, Sudanese, and Yemeni workers with Egyptian workers - Egyptian migration and remittances increased significantly, and reached their peak (Nassar, 2011).

During the Asian financial crisis of the late 1990s, Egyptian migration and remittances were negatively affected, especially due to tough competition of unskilled, low-wage Southeast Asian labor in the Gulf Cooperation Council countries. It was not before the early 2000s that Egyptian migration regained its pace. Especially with rising crude oil prices in the early 2000s, remittances of Egyptian migrants gained momentum as oil-rich Arab states experienced significant increases in oil supply and revenues, and increased their labor demand, which fueled Egyptian migration. Following these facts and recalling Figure 1, we argue that there has to be some correlation between the average oil supply in countries hosting Egyptian migrants and remittances to Egypt. That is, the average oil supply in such countries, measured by barrels per day, is a good measure of the prospect of Egyptian migration, and thereby of the prospect of sending remittances. Finally, the average oil supply is a good instrumental variable, not only because it is correlated well with Egyptian remittances, but also

[12] Political unrest, the transition to socialism, and economic deprivation in the late 1960s led many Egyptians to migrate permanently to North America and to Europe.

because it obviously cannot affect Egyptians' schooling and labor force participation decisions by any means other than through its correlation with remittances.

5. Estimation Results

In all the Tables that display our estimation results (Tables 3-11), the first and the fifth columns present the results of the standard OLS, where we cluster the standard errors at the governorate level. In the second and the sixth columns, and in the third and the seventh columns, we provide the estimation results of the modified OLS with regional and destination country fixed effects, (FE1) and (FE2), respectively. Finally, the fourth and the eighth columns report the results of the instrumental variable (IV) approach, where we also include the first-stage regression results, which suggest that our instrumental variable is sufficiently correlated with the probability of receiving remittances, that is, the coefficient of the average oil supply of a destination country is positive and significant.

In all the Tables, the first four columns report the results of the estimations using the *Remittances* variable, and the last four columns report the results of the estimations using both the *Remittances* and *Absenteeism* variables, as well as the interaction variable, (*Remittances*)*(*Absenteeism*), so as to capture the total effect that incorporates the family disruption effect. We report only the results for children aged between six and 18. That is, in Tables 3, 6, and 9, our sample consists of 446 children of school age. In Tables 4, 7, and 10, our sample consists of 219 girls of school age, and in Tables 5, 8, and 11, it consists of 227 boys of school age. In all the Tables, we present the estimation results only for the key variables, that is, we do not include the specific results for individual and household characteristics so as not to clutter the picture.[13]

The results in Table 3 suggest that the impact of remittances on the likelihood of school enrollment is positive and statistically significant, especially in the standard OLS, and when we introduce fixed effects. Still it is likely that the standard OLS estimation generates positively biased results. That is, the impact of remittances on the likelihood of school enrollment becomes smaller and even less significant when we control for unobserved heterogeneity, especially by introducing regional and destination country fixed effects. When we control for the endogeneity and selection bias problems by means of an instrumental variable, we find no significant impact of the prospect of

[13] The estimation results for all different specifications and separately for boys and girls of school age are available upon request.

receiving remittances on the likelihood of school enrollment, although the coefficient has the expected sign: the higher the likelihood of receiving remittances, the higher the likelihood of school enrollment. As is clear from Tables 4 and 5, these findings hold, by and large, also for the sub-sample of boys and girls. As for the total effect of remittances, our estimation results suggest that if both parents are absent, then the impact of remittances on the likelihood of school enrollment turns out to be negative, especially when fixed effects are used, which may be interpreted as evidence that the negative family disruption effect may dominate the positive effect of remittances (Tables 3 and 4).

As for the influence of remittances on the likelihood of labor force participation of children (which can be construed as the inverse image of school enrollment), our estimation results suggest a negative and statistically significant effect, especially in the standard OLS and in the OLS that controls for unobserved heterogeneity both at the level of regions and host countries (Table 6). As in the case of school enrollment, the coefficients become less significant, especially when we introduce governorate and destination country fixed effects. When we carry out the same estimations for boys and girls separately, we find no significant effect of remittances on the likelihood of labor force participation, except that there is a small, negative and significant influence for girls when we control for endogeneity and selection bias problems (Tables 7 and 8). As for the total effect, the likelihood of labor force participation significantly decreases, also in the remittance-receiving households from which both parents are absent (the IV-estimation results in Table 6). This result holds also for the sub-sample of girls when the IV model is employed (Table 7).

In particular, the IV-estimation results suggest that family disruption significantly increases the likelihood of labor force participation for the whole sample, as well as for the sub-sample of girls. Though the positive effect of remittances overcompensates the negative family disruption effect, and although it acts to decrease the likelihood of labor force participation in remittance-receiving households, this consequence might be due to an increase in household members' reservation wage, and to a decrease in the need for additional income generated by young, non-migrant household members in such households (Tables 6 and 7). This outcome may also constitute evidence that family disruption leads young members of remittance-receiving households to substitute unpaid (domestic) jobs for paid ones, especially given the likelihood that school enrollment decreases with family disruption in remittance-receiving households.

Finally, the influence of remittances on the age at which children enter the labor force is positive and statistically significant in all the specifications, namely in the standard OLS, in the OLS with regional and destination country fixed effects, and in the instrumental variable approach (Table 9).

The influence becomes more significant, and the magnitude of the coefficients becomes bigger, especially when we control for unobserved heterogeneity with fixed effects at the regional and the host country level. When we carry out the same estimations for boys and girls separately, the results of which are displayed in Tables 10 and 11, we find no significant effect of remittances on the age of boys (of school age) entering the labor force. As for girls of school age, the influence is positive and statistically significant. So, the higher the prospect of receiving remittances, the older the age of the first participation in the labor force on average. In remittance-receiving households from which both parents are absent, however, the age at which children enter the labor force decreases (Tables 9 and 10).

An interesting finding displayed in Tables 3-11 is that the longer the time since the migrant's last visit, the higher the probability of school enrollment. The reason may be that prolongation of the absence is precisely due to a concerted effort to continuously finance the education of the children, or be a consequence of their continuous schooling which renders it unnecessary to visit often in order to inject discipline and ensure attentive schooling of children.

6. Concluding remarks

We have found that remittances positively and significantly influence the human capital formation of Egyptian children. Each of the three estimations generates consistent results, and provides support both for the positive income effect of remittances and for the negative family disruption effect of migration. That is, remittances positively and significantly affect the likelihood of school enrollment, and negatively and significantly affect the likelihood of labor force participation, as well as postpone the age of the first participation in the labor force: on average, a 10 per cent increase in the likelihood of receipt of remittances increases the likelihood of school enrollment by close to 1.5 per cent, and decreases the likelihood of labor force participation by close to 3 per cent. Although, with regard to the likelihood of school enrollment and the age of the first participation in the labor force, the migration disabling effect seems to dominate the remittances enabling effect, the likelihood of labor force participation decreases even in households in which the disruptive effect of migration is stronger, namely when both parents are absent.

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[Tables 2-11 about here]

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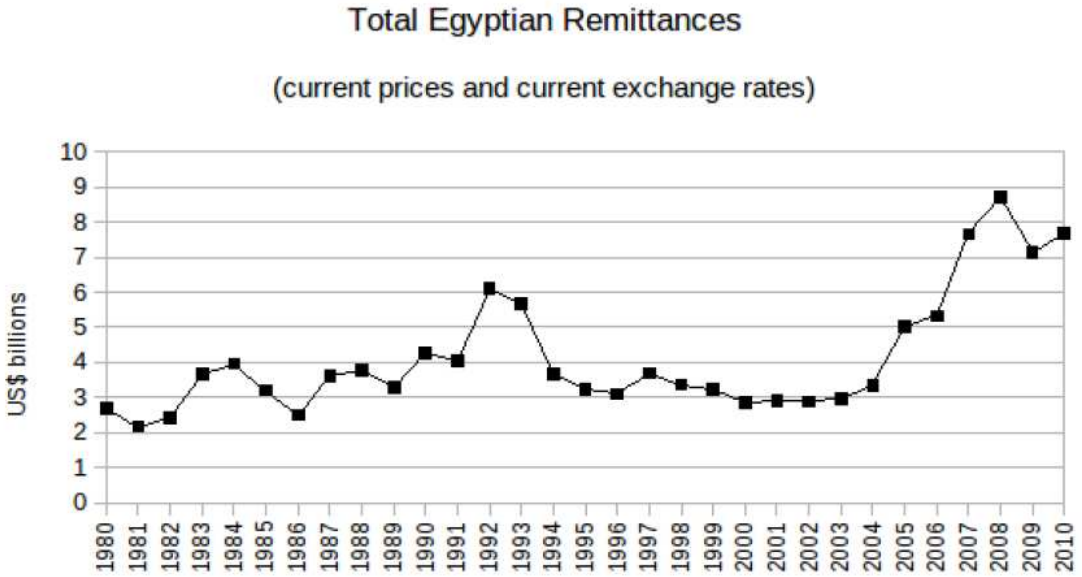

Source: UNCTADstat online. Authors' calculations.

Figure 1: Remittances to Egypt

Table 1: Origin of remittance flows to Egypt, 2007/2008

	Remittance inflows	
Source	US$ billions	% share
United States	2.76	32.20
Arab countries	4.45	51.90
Saudi Arabia	0.96	11.20
Kuwait	1.80	21.00
UAE	1.40	16.30
Other Arab countries	0.29	3.40
Europe	0.93	10.90
UK	0.27	3.20
Germany	0.23	2.70
Switzerland	0.26	3.00
Other European countries	0.17	2.00
All other countries	0.43	5.00

Source: The Central Bank of Egypt; El-Sakka (2010: 48), Table 1.

Table 2: A summary of empirical findings

Study	Country	Data/Period	Estimation method	Instrumental variable	Main findings
The impact of migration and remittances on human capital formation of children					
Elbadawy/Roushdy (2010)	Egypt	Egypt Labor Market Panel Survey /2006	IV-probit/tobit	The share of households with migrants	The estimates suggest an **insignificant** (**positive**) effect of migration (remittances) on the likelihood of school attendance.
Acosta (2011a)	El Salvador	El Salvador's National Household Survey/1998	OLS; Propensity score matching; IV-2SLS; Bivariate probit ML	Migrant networks at the level of municipality and household	The OLS-probit estimates suggest a positive effect; all the other estimates suggest an **insignificant** effect of remittances on the likelihood of staying in school.
Acosta (2011b)	El Salvador	The BASIS (unbalanced) Rural Panel Survey/1997; 1999; 2001	OLS; Panel-household fixed effects	—	The OLS estimates suggest a positive association b/w migration and the school attendance prob.; the estimates with household fixed effects suggest an **insignificant** association.
Edwards/Ureta (2003)	El Salvador	El Salvador's National Household Survey/1997	The Cox proportional hazard model	—	The estimates suggest remittances **negatively** affect the hazard of leaving school.
Boucher *et al.* (2009)	Mexico	Mexico's National Rural Household Survey/1980-2002, 2003	Dynamic Panel-GMM; Probit	—	The dynamic model and the probit estimates suggest, resp., a negative, statistically **insignificant** relationship b/w schooling and migration, and no significant impact of migrant networks on enrollment probabilities.
Alcaraz *et al.* (2012)	Mexico	Mexico's National Occupation and Employment Survey/2008-09	DiD; IV-2SLS	Distance to the US border (the 1920 rail network)	The DiD and IV-2SLS estimates suggest, resp., an **insignificant**, and a large, **positive** effect of remittances on school attendance.
Hanson/Woodruff (2003) Borraz (2005)	Mexico	Mexico's Population and Housing Census/2000	OLS; IV-2SLS	Historical migration rates	Both the OLS and the IV-2SLS estimates suggest a small, **positive** effect of migration and remittances on the highest grades completed.
Cuecuecha (2009)	Mexico	Mexico's Population and Housing Census/2000	IV-generalized Heckman/two-stage selection correction	The state & municipality migration rates; The share of remittance-receiving households	The results suggest a **positive** (**negative**) effect of remittances (migration) on the average schooling years, and a **positive** (**negative** if migrants left more than 5 y.a.) overall effect.

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Study	Country	Data/Period	Estimation method	Instrumental variable	Main findings
McKenzie/Rapoport (2011)	Mexico	Mexico's National Survey of Demographic Dynamics/1997	IV-probit; OLS; IV-2SLS; IV-ordered probit; IV-censored ordered	Historical migration rates	The IV-probit estimates suggest a **negative** effect of migration on the probability of attending school. Both the IV-2SLS, and the IV-ordered and censored ordered probit estimates suggest a **negative** effect of migration on attained years of schooling.
Antman (2011)	Mexico	Mexico's National Urban Labor Force Survey/2001	Panel/IV-individual fixed effects	Employment levels (construction, and accommodation and food) in the US	The estimates suggest a **negative** effect of parental migration on weekly hours spent studying.
López-Córdova (2005)	Mexico	Mexico's Population and Housing Census/2000	OLS; IV-2SLS	Variation in rainfall at the municipality level; Distance to Guadalajara (central Mexico)	Both the OLS and the IV-2SLS estimates suggest a **negative** effect of remittances on illiteracy, and **ambiguous** effects on school attendance.
Kandel/Kao (2001)	Mexico	Author's collection of student surveys (the western Mexican state of Zacatecas)/1995-96	OLS; Logit	—	The OLS (logit) estimates suggest a **positive** (**negative**) association b/w levels of migration and academic performance (university aspirations).
Yang (2008)	Philippines	Surveys (Overseas Filipinos; Labor Force; Income and Expenditure; Poverty Indicators)/1997-98	Panel/IV-fixed effects	The Asian financial crisis (exchange rate shocks)	The results suggest a **positive** association b/w remittances, changing through exchange rate shocks, and child schooling.
Arguillas/Williams (2010)	Philippines	Survey of Households; Children of Overseas Workers Survey/1999	OLS; Logit	—	The OLS estimates suggest a **positive** effect of migration on the years of schooling; the logistic regressions suggest a **positive** effect of the frequency of remittances on the likelihood of completing high school.
Amuedo-D. *et al.* (2010)	Haiti	Latin American Project/2000-01; 2002-03	IV-LPM; IV-probit	The real weekly earnings of the Hispanic workers in the US; The US state-level unemployment rates	The IV-linear prob. model (LPM) and IV-probit suggest, resp., a **positive** and an **insignificant** combined effect of migration and remittances on the likelihood of schooling.

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Study	Country	Data/Period	Estimation method	Instrumental variable	Main findings
The impact of migration and remittances on child labor					
Elbadawy/Roushdy (2010)	Egypt	Egypt Labor Market Panel Survey /2006	IV-probit/tobit	The share of households with migrants	The estimates suggest a **negative** effect of migration and remittances on the likelihood of working for income.
Alcaraz *et al.* (2012)	Mexico	Mexico's National Occupation and Employment Survey/2008-09	DiD; IV-2SLS	Distance to the US border (the 1920 rail network)	The DiD and IV-2SLS estimates suggest, resp., an **insignificant**, and a large, **negative** effect of remittances on child labor.
Antman (2011)	Mexico	Mexico's National Urban Labor Force Survey/2001	Panel/IV-individual fixed effects	Employment levels (construction, and accommodation and food) in the US	The estimates suggest a **positive** effect of parental migration on weekly hours spent working outside the home.
Acosta (2011a)	El Salvador	El Salvador's National Household Survey/1998	OLS; Propensity score matching; IV-2SLS; Bivariate probit ML	Migrant networks at the level of municipality and household	The OLS-probit estimates suggest a small, negative effect; all the other estimates suggest a large, **negative** effect of remittances on the likelihood of working for income.
Acosta (2011b)	El Salvador	The BASIS (unbalanced) Rural Panel Survey/1997; 1999; 2001	OLS; Panel-household fixed effects	—	Both the OLS estimates and the ones with household fixed effects suggest a **negative** association b/w migration and child labor.
Yang (2008)	Philippines	Surveys (Overseas Filipinos; Labor Force; Income and Expenditure; Poverty Indicators)/1997-98	Panel/IV-fixed effects	The Asian financial crisis (exchange rate shocks)	The results suggest a **negative** association b/w remittances, changing through exchange rate shocks, and child labor.
Calero *et al.* (2009)	Ecuador	Survey of Households — Living Conditions in Ecuador/2005-06	IV-probit	Western Union offices; Source country dummies	The estimates suggest a **negative** effect of remittances on child labor.
Mansuri (2006)	Pakistan	Pakistan Rural Household Survey/ 2001-02	OLS; IV-2SLS	The share of households with migrants; the village land gini (interaction: the number of adult males)	Both the OLS and IV-2SLS estimates suggest a **negative** effect of migration on the odds the child works, and on the reported number of days worked.

Study	Country	Data/Period	Estimation method	Instrumental variable	Main findings
Bredl (2011)	Haiti	Latin American Project/2000-01; 2002-03	The Cox proportional hazard model	—	The estimates suggest an **insignificant** effect of migration and remittances on the hazard of leaving school.
Amuedo-D./Pozo (2010)	Dominican Republic	Latin American Project/1999 and 2000	IV-2SLS/LPM	The average real earnings (personal care & service) in the US; The US state-level unemployment rates	The two-stage LPM suggests a **positive** effect of the probability of receiving remittances on the likelihood of school attendance in households without migrants, and a **negative** (statistically insignificant) effect when all households are considered.
Calero *et al.* (2009)	Ecuador	Ecuador Living Standards Survey/ 2005-06	IV-probit	Variation in availability of Western Union offices; Source country dummy for remittances	The estimates suggest a **positive** effect of remittances on school enrollment.
Adams/Cuecuecha (2010)	Guatemala	Guatemala's Household Budget Survey/2000	IV-generalized Heckman/two-stage selection correction	Aggregate migration* Unexpected rainfall; US employment creation* (Age of household head)^2; Distance to railroad stations	The estimates suggest a **positive** association b/w receipt of remittances and education expenditures.
Bansak/Chezum (2009)	Nepal	Nepal Living Standards Survey/ 1995-96	IV-2SLS	Past literacy rates; Political unrest by district	The IV-2SLS estimates suggest a **positive (negative)** association b/w remittances (absenteeism/family disruption) and the likelihood of school enrollment.
Mansuri (2006)	Pakistan	Pakistan Rural Household Survey/ 2001-02	OLS; IV-2SLS	The share of households with migrants; the village land gini (both interacted with the number of adult males in the household)	Both the OLS and IV-2SLS estimates suggest a **positive** effect of migration on the likelihood of school enrollment and school attendance, and on progress through school and completed grades.
Robles/Oropesa (2011)	Peru	Latin American Project/2001 and 2005	IV-Survival Analysis/ Weibull Parameterization & IV-Linear model and IV-Probit	The household head's past migration experience	The IV-linear model (IV-probit estimates) suggests a **negative (positive)** effect of the risk of migration on schooling years (the likelihood of school disruption).

Table 3: School enrollment

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	.0958	.0669	.0675	.2156	.1288	.1297	.1428	
	(.0310)***	(.0356)*	(.0367)*	(.2048)	(.0364)***	(.0526)**	(.0554)***	
Remittances*Absenteeism					-.0628	-.1195	-.1416	.1677
					(.0547)	(.0675)*	(.0719)**	(.1868)
Absenteeism					.0180	.0576	.0765	-.0984
					(.0531)	(.0531)	(.0569)	(.1137)
Years Since Last Visit	.0133	.0122	.0137	.0155	.0130	.0106	.0122	.0154
	(.0035)***	(.0053)**	(.0058)**	(.0056)***	(.0039)***	(.0054)**	(.0058)**	(.0058)***
Average Oil Supply				.0000165				.5617134
				(5.11e-06)***				(.0443405)***
Sample Size	446	446	446	433	446	446	446	433

Table 4: School enrollment: only girls of school age

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	.1435	.0594	.0576	.6229	.1733	.1644	.2051	
	(.0670)**	(.0596)	(.0615)	(.4000)	(.0635)***	(.0869)*	(.0909)**	
Remittances*Absenteeism					-.0559	-.1802	-.2569	.5428
					(.0936)	(.1083)*	(.1155)**	(.3238)*
Absenteeism					.0425	.1644	.2200	-.3230
					(.0734)	(.0857)*	(.0937)**	(.2281)
Years Since Last Visit	.0158	.0137	.0152	.0165	.0167	.0121	.0146	.0217
	(.0075)**	(.0080)*	(.0089)*	(.0084)*	(.0075)**	(.0080)	(.0088)*	(.0084)***
Average Oil Supply				.0000142				.6674555
				(6.78e-06)**				(.060468)***
Sample Size	219	219	219	214	219	219	219	214

Table 5: School enrollment: only boys of school age

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	.0372	.0368	.0335	.0105	.0773	.0800	.0741	
	(.0347)	(.0460)	(.0480)	(.2199)	(.0365)**	(.0697)	(.0745)	
Remittances*Absenteeism					-.0668	-.0774	-.0728	.0064
					(.0621)	(.0907)	(.0971)	(.2289)
Absenteeism					-.0363	-.0358	-.0348	-.0701
					(.0723)	(.0699)	(.0751)	(.1185)
Years Since Last Visit	.0101	.0117	.0119	.0116	.0102	.0115	.0113	.0119
	(.0061)*	(.0074)	(.0080)	(.0074)	(.0065)	(.0075)	(.0081)	(.0078)
Average Oil Supply				.0000198				.454258
				(7.75e-06)**				(.0671616)***
Sample Size	227	227	227	219	227	227	227	219

Note: The standard errors are given in parentheses.

Table 6: Labor force participation

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	-.0471	-.0552	-.0515	-.2803	-.0559	-.0595	-.0526	
	(.0191)**	(.0287)*	(.0294)*	(.1794)	(.0185)***	(.0426)	(.0447)	
Remittances*Absenteeism					.0058	-.0013	-.0070	-.2996
					(.0454)	(.0547)	(.0580)	(.1609)*
Absenteeism					.0046	.0220	.0226	.1714
					(.0355)	(.0430)	(.0459)	(.0980)*
Years Since Last Visit	-.0015	-.0024	-.0011	-.0059	-.0016	-.0030	-.0017	-.0072
	(.0042)	(.0043)	(.0047)	(.0049)	(.0044)	(.0043)	(.0047)	(.0050)
Average Oil Supply				.0000165				.5617134
				(5.11e-06)***				(.0443405)***
Sample Size	446	446	446	433	446	446	446	433

Table 7: Labor force participation: only girls of school age

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	-.0620	-.0597	-.0585	-.6872	-.0942	-.0787	-.0865	
	(.0409)	(.0393)	(.0394)	(.3633)*	(.0540)*	(.0576)	(.0589)	
Remittances*Absenteeism					.0435	.0208	.0340	-.6053
					(.0576)	(.0719)	(.0748)	(.2626)**
Absenteeism					-.0310	.0036	-.0152	.3855
					(.0424)	(.0569)	(.0607)	(.1849)**
Years Since Last Visit	.0051	.0016	.0062	.0039	.0061	.0025	.0068	.0001
	(.0063)	(.0053)	(.0057)	(.0077)	(.0059)	(.0053)	(.0057)	(.0068)
Average Oil Supply				.0000142				.6674555
				(6.78e-06)**				(.060468)***
Sample Size	219	219	219	214	219	219	219	214

Table 8: Labor force participation: only boys of school age

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	-.0388	-.0382	-.0343	.0465	-.0657	-.0739	-.0710	
	(.0232)*	(.0400)	(.0415)	(.1935)	(.0300)**	(.0604)	(.0645)	
Remittances*Absenteeism					.0439	.0624	.0632	.0508
					(.0496)	(.0786)	(.0840)	(.2006)
Absenteeism					.0020	-.0177	-.0205	-.0038
					(.0430)	(.0606)	(.0650)	(.1039)
Years Since Last Visit	-.0023	-.0017	-.0019	-.0022	-.0023	-.0013	-.0014	-.0021
	(.0060)	(.0065)	(.0070)	(.0065)	(.0061)	(.0065)	(.0070)	(.0069)
Average Oil Supply				.0000198				.454258
				(7.75e-06)**				(.0671616)***
Sample Size	227	227	227	219	227	227	227	219

Note: The standard errors are given in parentheses.

Table 9: The age of children entering the labor force

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	.2886	.3326	.3224	1.3299	.2280	.2718	.2704	
	(.1088)***	(.1050)***	(.1073)***	(.6815)*	(.1205)*	(.1555)*	(.1627)*	
Remittances*Absenteeism					.1344	.1409	.1246	-.2996
					(.1816)	(.1995)	(.2111)	(.1609)*
Absenteeism					-.0667	-.0960	-.1013	.1714
					(.1098)	(.1570)	(.1670)	(.0980)*
Years Since Last Visit	.0072	.0127	.0117	.0236	.0067	.0141	.0135	-.0072
	(.0093)	(.0158)	(.0170)	(.0187)	(.0088)	(.0158)	(.0171)	(.0050)
Average Oil Supply				.0000165				.5617134
				(5.11e-06)***				(.0443405)**
Sample Size	446	446	446	433	446	446	446	433

Table 10: The age of children entering the labor force: only girls of school age

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	.3008	.3612	.3453	1.8564	.2050	.2414	.2136	
	(.1737)*	(.1338)***	(.1331)***	(1.0428)*	(.1409)	(.1984)	(.2026)	
Remittances*Absenteeism					.2293	.2941	.3270	-.6053
					(.2599)	(.2474)	(.2574)	(.2626)**
Absenteeism					-.0458	-.1372	-.1035	.3855
					(.1514)	(.1958)	(.2088)	(.1849)**
Years Since Last Visit	-.0031	.0088	-.0047	-.0012	-.0091	.0045	-.0082	.0001
	(.0140)	(.0180)	(.0193)	(.0220)	(.0131)	(.0182)	(.0196)	(.0068)
Average Oil Supply				.0000142				.6674555
				(6.78e-06)**				(.060468)***
Sample Size	219	219	219	214	219	219	219	214

Table 11: The age of children entering the labor force: only boys of school age

	Remittances				Remittances & Absenteeism			
	OLS	FE1	FE2	IV	OLS	FE1	FE2	IV
Remittances	.2205	.1961	.1761	.7781	.3207	.3613	.3686	
	(.1363)	(.1631)	(.1703)	(.8014)	(.1782)*	(.2463)	(.2639)	
Remittances*Absenteeism					-.1599	-.2873	-.3269	.0508
					(.1593)	(.3207)	(.3440)	(.2006)
Absenteeism					.0064	.0773	.0899	-.0038
					(.1136)	(.2473)	(.2661)	(.1039)
Years Since Last Visit	.0057	.0070	.0128	.0186	.0054	.0047	.0099	-.0021
	(.0132)	(.0263)	(.0285)	(.0271)	(.0138)	(.0264)	(.0286)	(.0069)
Average Oil Supply				.0000198				.454258
				(7.75e-06)**				(.0671616)***
Sample Size	227	227	227	219	227	227	227	219

Note: The standard errors are given in parentheses.