



Remittances, Liquidity Constraints and Human Capital Investments in Ecuador

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Summary. — Over the last decade Ecuador has experienced a strong increase in financial transfers from migrated workers. This paper investigates how remittances *via* trans-national networks affect human capital investments through relaxing resource constraints and facilitate households in consumption smoothing by reducing vulnerability to economic shocks. Our results show that remittances increase school enrollment and decrease incidence of child work, especially for girls and in rural areas. Furthermore, we find that aggregate shocks are associated with increased work activities, while remittances are used to finance education when households are faced with these shocks.

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1. INTRODUCTION

Ecuador has experienced a strong increase in financial transfers from migrated workers during the last decade. Since 1999 these resource flows constitute the second largest source of foreign income in Ecuador after oil exports, amounting to 6.4% of GDP in 2005 (Inter-American Development Bank, 2006). Despite the magnitude of this remittance inflow, there is relatively little empirical research that examines the role of remittances on the economy of Ecuador and livelihoods and behavior of remittance receiving households.

In general, the literature on international migration and remittances does not provide an unambiguous picture on the outcomes for the receiving economy. A number of studies point out negative effects of remittances as they may discourage labor supply and effort of recipient households (Funkhouser, 1992) or finance current consumption promoting dependency of receiving countries (e.g., Taylor *et al.*, 1996a, 1996b). On the other hand, more recent empirical evidence emphasizes the role of remittances in encouraging economic growth and development by enabling recipients to overcome liquidity constraints and finance productive investments (see Rapoport and Docquier (2006), for an extensive literature review).

Taking a cue from the latter line of research, this paper investigates the potential role of remittances in influencing human capital accumulation in Ecuador. Resource constraints and imperfect capital markets play a notable role in households' decisions concerning investment in children's human capital in Ecuador (e.g., Moser, 1996; Moser & Felton, 2007; Ponce, Bedi, & Vos, 2003). By reducing financial constraints, remittances can promote schooling investment and increase child reservation wages, thereby reducing children's labor force participation. In addition, trans-national social networks provide income diversification strategies and alternative coping mechanisms for consumption smoothing, through

remittances, in response to economic shocks. In the context of imperfect financial markets, investments in human capital are typically compromised by income variability (e.g., Beegle, Dehejia, & Gatti, 2006; Dehejia & Gatti, 2005; Jacoby & Skoufias, 1997).

Several studies have found evidence that remittances and international migration are associated with increased educational attainment and reduction in child labor supply. For example, using migration networks and household migration history as instruments for remittances, for El Salvador, Acosta (2006) finds that girls and boys under 14-years-old from recipient families are more likely to attend school than those from non-recipient households, while remittances also seem to reduce child labor supply. In a similar vein, also based on data from El Salvador, Cox and Ureta (2003) find that remittances reduce school dropout hazard rates. Borraz (2005) instruments remittances using historical migration patterns and distance to the United States and finds that remittances have a positive but small effect on schooling for boys and girls with low educated mothers and who reside in cities with less than 2,500 inhabitants. Hanson and Woodruff (2002) use migration patterns to instrument migration and find that having a migrated family member has a positive effect on educational outcomes for girls in Mexico (aged 10–15) whose mothers have a very low level of education. Using a similar empirical strategy, Mansuri (2006) finds strong positive effects of temporary economic migration on investments in children's schooling in Pakistan, especially for girls.

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However, other findings present mixed results of the effect of migration and remittances on child schooling. In a study on 11 Latin American countries, Acosta, Fajnzylber, and López (2007), also using migration networks as an instrument, find that remittances are associated with increased educational attainment in only six countries (Nicaragua, Guatemala, Honduras, Ecuador, Haiti, and El Salvador), the effect being larger for children whose mothers have a low level of education. Similarly, using historical migration rates to instrument current migration, McKenzie and Rapoport (2006) find a negative effect of migration on schooling attendance and education attainment among 16–18-year-old girls and 12–18-year-old boys, but a positive effect for younger girls with uneducated mothers in rural Mexico. They attribute these outcomes to side effects of migration. For instance, the absence of parents in the household due to migration could lead to reduced investment in their children's education and an increase in the incidence of child work. Relying on rainfall data as instrument for remittances, López-Córdova (2005) shows that these effects are especially relevant for secondary school age children in Mexico, as receiving remittances positively affect school attendance for children aged 6–14, but negatively for boys and girls aged 15–17.

Recent empirical work also brings to light the importance of remittances as a coping mechanism against shocks. Yang and Choi (2007) exploit exogenous variation in rainfall to identify an insurance motive for international migration among households in the Philippines, as they find a negative relationship between remittances and income variation for migrant households. Using panel data, Halliday (2006) provides evidence that agricultural shocks, particularly livestock loss and harvest loss, result in an increment of remittances received by Salvadorian households. Miller and Paulson (2007) show that in Thailand remittances respond to aggregate (rainfall and GDP) and idiosyncratic shocks (medical expenditures), in particular when recipient households face negative shocks, suggesting that remittances are used as a risk management strategy.

The main contribution of this paper is linking the two strands of literature discussed above, by evaluating: (i) the direct contribution of remittances to investment in human capital, (ii) the effects of shocks on these investments, and (iii) the role of trans-national networks as coping mechanisms (through remittances) for households in dealing with these shocks. Similar to other studies on remittance and human capital, we focus on outcomes such as school enrollment and child labor. In addition, we probe further by examining the effect of remittances on the quality of these investments, as reflected in the substitution between public and private education.

Caution is required when interpreting estimated effects of remittances on school enrollment and child work as causal relations because of the endogenous nature of remittances. In this paper, identification relies on instrumental variables that exploit information on source countries of remittances and regional variation in the availability of bank offices that function as formal channels for receiving remittances. These instruments capture information on transfer costs and accessibility to channels of transmission, which partly determine the volume and frequency of funds transferred, while they are not expected to affect school enrollment and child labor. While details are discussed later in the text, we find that the instruments provide strong support for identification and that the validity of the instruments is not rejected by tests of over-identifying restrictions. In addition, the results are robust to the choice of instruments and a variety of alternative specifications.

Our results show that remittances increase school enrollment and decrease incidence of child work, especially for girls

and in rural areas of Ecuador. We further find that aggregate shocks are associated with increased work activities, while remittances are used to smooth education investments when households are faced with these shocks. This suggests that liquidity constraints and vulnerability to covariate risk are especially relevant in rural areas, as it affects household's investments in human capital of school age children. In this context both child labor and remittances function as coping mechanisms.

The paper is organized as follows: Section 2 describes the data used in the analysis, while Section 3 illustrates the context of education, migration and remittances in Ecuador. Our empirical strategy is set out in Section 4 and the results are presented and discussed in Section 5. Section 6 concludes.

2. THE DATA

Our analysis draws on a nationally representative living standard household survey for Ecuador from 2005 to 2006, *Encuesta Condiciones de Vida—Quinta Ronda* (ECV). The ECV covers a wide range of socio-economic indicators for households and individuals, including school enrollment and work activities in the previous week. We focus on work activities that contribute to household income (non-domestic work) and domestic work, for which information is collected for children 10 years and older. To elaborate, non-domestic work is defined as having worked at least 1 h in the week prior to the survey, either for cash, remuneration in kind, or unremunerated work that directly increases household income (e.g., helping other household members in a family business or farm). Domestic work refers to household chores that do not directly increase household income.

Information on remittances includes the size of cash transfers received from abroad, the country where the remittances come from and how they were spent (e.g., construction, investment, non-durable consumption, food, housing, education, and health care). The survey also asks questions regarding unexpected events and shocks that have affected households' income during the last year. These include idiosyncratic shocks such as severe illness, accidents, or death of a household member, and covariate shocks such as natural disasters, droughts, insect plagues, and unexpected periods of frost.

The 2005–06 survey includes 55,666 individuals from 13,581 households and is representative at the province level. We restrict our analysis to children of school going age and in the age group for whom information on labor market participation is collected in the survey. This yields a sample of 8,600 children of age 10–17 of which 14% live in a household that receives remittances.¹ Table 1 presents descriptive statistics for the sample separately for children from recipient and non-recipient households.

3. REMITTANCES, EDUCATION, AND CHILD WORK IN ECUADOR

(a) *Migration and remittances*

Over the last decade Ecuador has experienced a large international out-migration motivated primarily by economic factors and facilitated by networks of earlier migrants. The financial and foreign exchange crisis during 1999 and the dollarization process in 2000 led to a severe deterioration of living standards and disrupted labor markets. GDP declined from 23,255 million dollars in 1998 to 16,674 million dollars in

Table 1. *Selected descriptive statistics, sample includes all children aged 10–17*

Variables	Non-recipients		Recipients	
	Mean	[s.d.]	Mean	[s.d.]
School enrollment	0.819		0.884	
Non-domestic work activities	0.386		0.306	
Domestic work activities	0.274		0.233	
Monthly <i>per capita</i> remittances	0.000	[0.000]	23.082	[40.505]
Age	13.272	[2.265]	13.512	[2.307]
Female	0.479		0.490	
Female head of household	0.075		0.159	
Head of household is married	0.643		0.664	
Highest educated female: none	0.083		0.041	
Highest educated female: primary	0.479		0.316	
Highest educated female: secondary	0.289		0.421	
Highest educated female: higher	0.149		0.221	
Highest educated male: none	0.045		0.024	
Highest educated male: primary	0.470		0.347	
Highest educated male: secondary	0.326		0.395	
Highest educated male: higher	0.159		0.234	
Household size	6.196	[2.265]	6.047	[2.115]
Home owner	0.752		0.747	
Dirt floor	0.116		0.062	
Access to water by public network	0.548		0.764	
Access to electricity	0.918		0.983	
In-house toilet	0.744		0.894	
Telephone	0.259		0.494	
Death, illness, accident	0.143		0.236	
Drought	0.235		0.168	
Periods of frost	0.171		0.138	
Plagues	0.216		0.111	
Rural area	0.533		0.384	
Poverty headcount in district	0.432	[0.123]	0.392	[0.121]
Unemployment rate in district	0.110	[0.045]	0.121	[0.043]
Rural population in district	0.487	[0.211]	0.457	[0.220]
Average age district	26.959	[1.743]	27.168	[1.546]
Sierra region	0.517		0.548	
Costa region	0.385		0.380	
Amazonia region	0.098		0.072	
Number of observations	7,371		1,229	

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

1999, and GDP *per capita* fell by 30%. The unemployment rate increased dramatically, peaking at 14.4% in 1999. Poverty rates increased from 39.3% before the crisis (1995) to 52.2% in 1999 (SIISE, 2007). As a result, a large number of Ecuadorians left the country to find work opportunities elsewhere (Acosta, López, & Villamar, 2005; Ramírez & Ramírez, 2005). According to the Inter-American Development Bank (2006), an estimated one million Ecuadorians migrated to Spain, United States, and other countries in Central America during 2000–05. Spain is the main migration destination, accounting for about half a million Ecuadorian migrants, followed by the United States with about a quarter (Inter-American Development Bank, 2006).

While previous waves (prior to the late 1990s) of Ecuadorian migration had been directed mainly to the United States, the more recent wave of migration has been directed mainly to Spain. An important determinant of destination country for the most recent generation of migrants has been differences in migration policy between Spain and the United States. The economic and political crisis experienced by Ecuador in the late 1990s was accompanied by increases in the costs and danger of migrating to the United States while at least till

2003, Ecuadorians could enter Spain without a visa (for details see Jokisch & Pribilsky, 2002).

The most visible economic consequence of this out-migration wave is the substantial and increasing amount of money that Ecuadorian migrants have been remitting. The Central Bank of Ecuador estimates that from 1996 to 2005 remittances have grown at an average rate of 19% and since 1999 constitute the second largest source of foreign income after oil exports, exceeding official development aid and foreign direct investment. In 2005, remittances reached a total of 2,005 million dollars, which amounts to 6.4% of GDP and 20% of exports (Inter-American Development Bank, 2006).

According to ECV 2005–06 about 16% of Ecuadorians live in a household that receives international transfers (Table 2). On average these households received US\$28.83 per capita per month. For recipient households this is equivalent to about 21% of monthly household income. Three-quarters of these households reside in urban areas and almost all live in the Sierra and Costa regions. This is due to the higher incidence of remittances in these areas, but for the most part due to population size. The bulk of remittance flows goes to middle and higher income households. The richest 40% of

Table 2. *Distribution of size of remittances (average per month)*

	Incidence (% of population)	Share (% of recipients)	Average amount (US\$ per capita)
Quintile 1 (poorest)	5.6	7.0	10.73
Quintile 2	12.1	15.2	11.90
Quintile 3	16.8	21.1	19.38
Quintile 4	23.3	29.3	30.37
Quintile 5 (richest)	21.8	27.4	48.05
Urban	18.6	74.4	30.37
Rural	11.2	25.6	24.38
Sierra	16.9	48.2	32.20
Costa	15.5	48.7	25.84
Amazonia	10.3	3.1	23.58
Ecuador	15.9	100.0	28.83

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

the population accounts for about 57% of the recipients, while 22% of the recipients come from the poorest 40% of the population. The latter group roughly represents those that live below the poverty line.² The amount received also strongly increases with overall level of consumption. The average remitted amount *per capita* (i.e., per head of the receiving household) is four times larger for the richest quintile compared to the poorest.

Recipient households report that they use income from remittances mainly for education, food, health, and rent (89.4%).³ The remainder is said to be used for construction and property investments (3.1%), settlement of debts (2.9%), savings (1.2%), business investments (1.2%), household assets such as fridges, stoves, and laundry machines (0.9%), acquisition of vehicles (0.3%), and other forms of consumption (1.0%). Interestingly, these reported spending patterns do not differ much between urban and rural households, although households in rural areas use a higher percentage of remittances for the acquisition of household assets and reserve a smaller share for savings. Bearing in mind fungibility of income from different sources, these expenditure patterns should be interpreted cautiously. Nevertheless, they do suggest the importance of human capital investments in the marginal spending priorities of households.

Table 3 shows the remittance flow reported for the last 12 months by the source country.⁴ More than half of the recipients receive transfers from Spain, while 35.4% receive funds from the United States, 9.8% from Italy, 2.1% from the Andean Community countries, and 4.5% from other countries. In terms of total volumes, Spain is the main source with the United States a close second. The amount of remittances originating from Spain is due to the large number of Ecuadorian migrants, but not the size of the transfers, as remittances from Spain are relatively small on a *per capita* basis. The share of recipients that receive remittances from Ecuadorians working in the Andean Community is small, but the average amount remitted is relatively large.

These migration flows and associated financial transfers manoeuvre through trans-national networks. We speak of trans-national networks when the reproduction of social and economic life of communities transcends national borders, connecting migrants in host country with their communities of origin, families, relatives, and friends (Herrera, 2002). Goycochea and Ramírez (2002) describe how for Ecuador these networks include migrants, their relatives and friends, social organizations and associations,⁵ and other micro-networks formed by travel agencies, informal agents, and intermediaries, and money lenders. Social ties are maintained by regular money transfers, the exchange of letters, photos, and phone calls. Ramírez and Ramírez (2005) relate how remittances allow migrants and their relatives to have common plans—such as building houses, paying school fees, and planning familiar meetings—and maintain an affective interaction and prolong familial ties over long distance.

In addition, trans-national networks play an important role in migration decisions. They facilitate migration “through providing information on the migration process itself, such as crossing the border; through providing information on destinations and jobs, and aiding integration after arrival; and through helping financing the cost of migration” (Dolfin & Genicot, 2006, p. 2). Ethnographic studies by Goycochea and Ramírez (2002), Pedone (2000), Wamsley (2001) provide an account of how trans-national networks support international migration by Ecuadorians.

(b) *Education and child work*

During 1995–2005 school enrollment increased at all school levels. Primary schooling in Ecuador starts at 6 until 11 years, with secondary school age typically being 12–17 years. Table 4 shows net school enrollment for primary schooling increased from 89% in 1995 to 94.2% in 2005, while net secondary school enrollment increased from 49.7% to 55.4%.

Table 3. *Source country and average size of remittances in the past month*

Source country	Share of recipients (%)	Transfer per capita (US\$)	Total remittances (US\$)
Spain	51.54	25.89	26,773,019
United States	35.42	33.12	24,122,609
Italy	9.84	30.95	4,771,111
Andean Community	2.08	39.01	1,703,870
Other countries	4.54	36.66	3,472,769

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

Table 4. *Work activities and net school enrollment, 1995–2005*
(percentages)

	1995	1998	1999	2005
Primary education	89.0	89.4	90.3	94.3
Secondary education	49.7	52.9	51.4	55.4
Work (age 10–17)	42.8	44.6	44.6	39.2

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 1995, 1998, 1999, and 2005–06.

With increased school enrollment, child work has decreased from 1995 to 2005. Table 4 reports incidence of economic work activities, excluding domestic work, among children aged 10–17. In 1998 and 1999 incidence of child work was at 44.6% which decreased to 39.2% in 2005.

In this paper, we study the effect of remittances on school enrollment as it is a better reflection of the household's investment decision than school attendance, given the fixed costs that are associated with it (e.g., school enrollment fees).⁶ Table 5 shows average school enrollment and work incidence separately for boys and girls from recipient and non-recipient households in the ECV 2005–06 sample. Remittances seem to be associated with higher enrollment and lower incidence of both domestic and non-domestic work.

About three-quarters of enrolled children attend a public school, but the share of private education increases with age, from 21.9% among children aged 10–11 years to 29.2% among 15–17-year-olds (Table 6). There are regional variations in availability of private schooling as reflected in the enrollment figures. Private schooling is more prevalent in urban areas (33.3% of enrolled children) compared to rural areas (11.4%). There are also large differences between regions. In the Costa and Sierra regions 28.0% and 25.5% of enrolled children attend a private school, respectively, while in Amazonia the private sector has a 5.2% share (Table 7). Remittances are positively associated with private education (Table 6). The enrollment rate in private school is higher for remittance households compared to non-remittance households. For all age groups, about a third of students from remittance receiving households attend a private school. This would suggest that remittances are partly used to increase quality of educa-

Table 5. *School enrollment and work for remittance recipients and non-recipients aged 10–17* (percentages)

	Remittance recipients			Remittance non-recipients		
	Boys	Girls	All	Boys	Girls	All
<i>Enrollment</i>						
10–11	98.55	99.16	98.88	97.57	97.12	97.34
12–14	91.52	93.50	92.48	85.74	83.14	84.54
15–17	78.87	78.93	78.90	67.75	70.19	68.95
10–17	88.27	89.69	88.98	82.75	82.68	82.72
<i>Non-domestic work</i>						
10–11	11.78	13.11	12.51	19.66	12.95	16.26
12–14	29.20	19.92	24.69	38.35	27.93	33.53
15–17	45.18	32.18	38.76	54.41	36.04	45.43
10–17	31.34	22.57	26.91	38.88	26.43	32.86
<i>Domestic work</i>						
10–11	8.38	12.39	10.58	12.30	10.99	11.64
12–14	18.37	18.94	18.65	22.43	25.48	23.84
15–17	29.56	28.47	29.03	29.88	31.87	30.86
10–17	20.38	20.65	20.52	22.30	23.53	22.89

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

Table 6. *Public-private mix among enrolled children aged 10–17*
(percentages)

	All		Remittance recipients		Remittance non-recipients	
	Public	Private	Public	Private	Public	Private
10–11	78.08	21.92	66.18	33.82	80.30	19.70
12–14	74.47	25.53	66.67	33.33	76.12	23.88
15–17	70.79	29.21	64.15	35.85	72.47	27.53
10–17	74.53	25.47	65.69	34.31	76.43	23.57

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

Table 7. *Public-private mix by expenditure quintile and region*
(percentages)

	Public	Private
Quintile 1 (poorest)	92.79	7.21
Quintile 2	87.20	12.80
Quintile 3	80.46	19.54
Quintile 4	70.63	29.37
Quintile 5 (richest)	37.48	62.52
Urban	66.75	33.25
Rural	88.60	11.40
Sierra	74.49	25.51
Costa	72.01	27.99
Amazonia	94.76	5.24

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

tion, if we take into account that private schooling in Ecuador typically provides higher quality education at higher costs.⁷

(c) *Idiosyncratic and aggregate shocks*

Idiosyncratic and aggregate shocks occur frequently, as shown in Table 8. Household-specific shocks such as death of a household member, illness, or accident are reported by 14.7% of households. We observe similar incidence of aggregate shocks, such as droughts (14.7% reported incidence), damage to agricultural produce due to frost (10.1%) and plagues (13.2). Interestingly, while aggregate shocks may be

Table 8. *Distribution of shocks during the past year* (% of population affected)

	Individual	Drought	Periods of frost	Plague
Quintile 1 (poorest)	15.7	27.8	18.8	27.5
Quintile 2	16.7	18.8	12.0	16.9
Quintile 3	15.0	13.3	9.6	11.1
Quintile 4	14.4	9.6	7.0	7.8
Quintile 5 (richest)	11.6	4.2	3.4	3.0
Urban	13.5	2.4	1.7	1.7
Rural	16.7	36.0	24.7	33.3
Sierra	16.7	20.3	19.3	16.7
Costa	12.1	10.6	2.7	9.9
Amazonia	21.8	3.8	0.7	14.8
Ecuador	14.7	14.7	10.1	13.2

Note: Individual shocks include severe illness, accident, or death of a household member.

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

expected to be a rural phenomenon, there is still some non-trivial incidence in urban areas. This would particularly reflect the urban fringes, which are likely to be susceptible to these aggregate shocks. In general, the incidence of aggregate shocks is negatively correlated with wealth. This is cause for concern in the multivariate analysis, as it could reflect non-random sorting of risk and shocks. For example, poor households may be more likely to move into high risk areas. Indeed, there seem to be regional patterns in the distribution of shocks. The Sierra region is a high risk area for all type of shocks, where agriculture is highly concentrated. The Costa region which is located at sea level and related to trade, fishing, and production of export products (bananas, tuna, shrimp, among others) is more likely to be affected by droughts and plagues, than by frost which takes place at high altitude. Finally, the tropical and sparsely populated Amazonia area, where oil extraction is the dominant economic activity, mainly experiences plagues. The strong association of aggregate shocks with geographic location and wealth would suggest that any bias from a non-random distribution of shocks could be greatly reduced by including regional and rural area indicator variables, and control for socio-economic characteristics of households. Individual shocks seem more evenly distributed, which could indicate that potential bias from idiosyncratic shocks is limited.

4. EMPIRICAL APPROACH

(a) *Empirical specification*

To estimate the impact of remittances on human capital investments, we model the probability of being enrolled in school, participating in income generating activities or domestic work as a function of remittance transfers, individual and household characteristics, and regional labor market and economic conditions. Besides dichotomous enrollment and work decisions, we investigate the effects of remittances on the quality of investment in human capital of children. We use substitution between public and private schooling as an indicator of quality.

The absolute amount of monthly *per capita* remittances received by households is our main explanatory variable of interest. Note that in the analysis, we are ignoring the migration decision itself and focussing only on the marginal effects of international transfers on schooling and labor supply. The disadvantage of this approach is that we do not analyze to what extent international migration is an integral part of a household's income diversification strategy. Instead, we treat remittance transfers as outcomes of existing trans-national networks. Thus, we do not separately identify the effects of migration and remittances. Rather, we take a reduced form approach in which we examine the role of trans-national networks in consumption smoothing, relaxing liquidity constraints and human capital investments.

We do not include income or household expenditures as covariates as there might be an endogenous relationship with the outcome variables. Schooling and work decisions directly affect household spending, while unobserved heterogeneity is likely to introduce additional confounders. Instead, we treat the household characteristics as proxies for the socio-economic status of the household. For individuals we control for age and gender, while household characteristics include information on the head of households (gender and marital status), education level of highest educated males and females, household size and living conditions (home ownership, type of

floor and sanitation, and access to electricity, telephone, and water by public network).

We consider both idiosyncratic shocks (a member of the household has recently been severely ill, had an accident, or died) and covariate shocks (droughts, insect plagues, or crops affected by frost) that households may be exposed to. In particular the latter are expected to affect human capital decisions as both market based and informal insurance and coping mechanisms may break down under aggregate shocks (e.g., Glewwe & Hall, 1998; Jacoby & Skoufias, 1997; Morduch, 1999; Skoufias, 2003). It is here that trans-national networks and remittances can play an important role as informal safety nets, as they transcend country-specific developments.

Since labor supply, schooling and remittances may all be driven by regional-specific labor market and economic characteristics, we control for the poverty headcount and unemployment rate in the province where the child lives, and the urban-rural composition and average age of the province population. In addition, we include dummy variables for the three main geographic areas of Ecuador: Sierra, Costa, and Amazonia.

(b) *Identification strategy*

Remittances received by households are potentially endogenous to human capital decisions and to child labor supply. This can be due to, for example, unobserved heterogeneity associated with both presence of trans-national networks and schooling decisions, or to income shocks affecting human capital investments and labor supply, while simultaneously adjusting remittances to reduce income volatility. There may even be reverse causality if households consider migration and remittances as an explicit means of funding education of their children.

Historical migration rates and presence of migration networks have been used as instrumental variables for current migration in a number of studies (e.g., Acosta, 2006; Acosta *et al.*, 2007; Hanson & Woodruff, 2002; Mansuri, 2006; McKenzie & Rapoport, 2006). The migration variables in these studies typically indicate individuals living in migration or remittance receiving households. Justification of this instrument lies with sociological literature, which argues that trans-national social networks promote migration of other household members. Thus, historical migration patterns partly determine current migration rates. But while these instruments may work for migration status of households, it is less suitable for the amount of remittances as past migration patterns are unlikely to explain variation in the amount of remittances among remittance-receiving households (McKenzie, 2005).

In this paper, we attempt to identify causal effects of remittances by exploiting exogenous variation in transaction costs of international financial transfers. Such transaction costs of transmission partly determine the volume and frequency of funds transferred internationally. At the same time, we do not expect these transaction costs to directly affect school enrollment and child labor supply. We use two sources of information that reflect transaction costs and accessibility to channels of transmission: the source countries of the remittances and regional variation in availability of Western Union bank offices that function as formal channels for transferring remittances (following Amuedo-Dorantes and Pozo (2006)). The variation in Western Union branches across provinces is shown in Table 9. Availability of Western Union branches per province is interacted with all source country dummy variables so as to fully exploit the variation in the instruments and increase support for identification.⁸

Table 9. *Remittances and number of Western Union branches by province*

Province	Western Union branches	Remittance recipients (%)	Average per month (US\$ per capita)
<i>Sierra region</i>			
Azuay	17	30.0	43.40
Bolivar	5	6.3	13.30
Canar	6	47.0	38.36
Carchi	2	3.0	13.15
Cotopaxi	1	9.7	18.96
Chimborazo	5	10.2	28.89
Imbabura	3	11.0	18.37
Loja	2	20.7	30.58
Pichincha	30	15.2	30.95
Tungurahua	5	16.6	23.58
Total	76	16.9	32.20
<i>Costa region</i>			
El Oro	7	21.5	34.40
Esmeraldas	3	9.8	21.97
Guayas	33	17.9	25.96
Los Rios	10	10.5	21.09
Manabi	13	10.7	21.20
Total	66	15.5	25.84
<i>Amazonia region</i>			
Morona Santiago	4	15.1	33.53
Napo	1	8.0	31.78
Pastaza	2	8.9	27.31
Zamora Chinchipe	2	19.9	10.00
Sucumbios	1	5.4	10.35
Orellana	3	5.7	15.53
Total	13	10.3	23.58
Ecuador	155	15.9	28.83

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

The IV probit approach that we use takes a linear specification for the first stage regression, and shows that the instru-

ments are jointly significant at a 1% level. We investigated the support of the instruments further by estimating the first stage equation as tobit in addition to a probit analysis of the probability of remittance receipt. We find that the Western Union variable is a strong determinant of the probability of receiving remittances but to a lesser extent for the amount sent. The country dummy variables are highly significant for the amount remitted. These results suggest that the instruments combined, and with interaction terms, provide strong support for identification of the effects of remittances.⁹

Some concerns regarding the validity of the instruments need to be addressed, as there remains a threat that they capture unobserved confounders besides transaction costs. A first potential pitfall could be that the availability of Western Union branch offices merely reflects the local economic environment. To mitigate this threat, the various specifications control for a number of regional labor market, demographic and economic characteristics (poverty headcount and unemployment rate in the province where the child lives, and the urban-rural composition and average age of the province population, dummy variables for the Sierra, Costa, and Amazonia regions). Furthermore, if the number of bank branches is simply a reflection of the local environment, then we would expect that the remittance effects are sensitive to the inclusion of these variables. However, we find that the coefficients of the remittance effect are not sensitive to excluding the regional variables, suggesting the instruments are not simply picking up regional effects. Without the inclusion of the regional variables the estimates are slightly less precise, but within a 95% confidence interval (see Table 13, columns 1 and 2). We also estimated a specification which relied only on the source country dummies to achieve identification. As shown in Table 13, column 6, the results are robust to this change.

A second concern is that the validity of the exclusion restriction on the source country dummy variables could be compromised if returns to human capital vary across source countries, and these returns relate to school investment incentives and decisions through trans-national networks. If this were the case then the choice of country could influence enrollment. On the other hand, if country choice is associated with returns to human capital, then it should also be strongly correlated

Table 10. *Effect of remittances on school enrollment and work incidence among children of age 10–17, marginal effects, by population group, excluding shock variables*

	All	Male	Female	Urban	Rural	Non-poor	Poor
<i>IV probit</i>							
School enrollment	0.0009**	0.0006	0.0013**	–0.00001	0.0042***	0.0001	0.0045*
Non-domestic work incidence	–0.0007	–0.0009	–0.0007	–0.0002	–0.0024	–0.0013**	0.0031
Domestic work incidence	0.0006	0.0008	–0.0001	0.0008*	–0.0011	–0.0002	0.0027
<i>IV MNL</i>							
Enrollment in public school	–0.0005	–0.0010	0.0001	–0.0018**	0.0020**	–0.0018**	0.0009
Enrollment in private school	0.0013***	0.0015*	0.0011**	0.0017**	0.0010*	0.0019**	0.0011**
Number of observations	8,600	4,466	4,134	4,199	4,401	4,384	4,200

Note: Other covariates have been omitted for convenience. These include the child's characteristics (age, age squared, and gender), characteristics of the head of household (gender, marital status, and education), household characteristics and living conditions (household size, owns home, house has dirt floor, access to water by public network, access to electricity, in-house toilet, and telephone), and regional welfare and demographic characteristics (rural dummy variable; poverty headcount, unemployment rate, percentage rural population, and average age in province; Sierra–Costa–Amazonia dummy variables). Significance levels for the IV MNL are based on bootstrapped standard errors with 100 replications. Detailed estimation results are reported in a *Supplemental Appendix*, which is available upon request.

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

*Statistical significance at 10% level.

**Statistical significance at 5% level.

***Statistical significance at 1% level.

Table 11. *Determinants of school enrollment among children of age 10–17, by population group (IV probit marginal effects)*

	All	Male	Female	Urban	Rural	Non-poor	Poor
Monthly <i>per capita</i> remittances	0.0009**	0.0007	0.0013**	–0.00005	0.0043***	0.0001	0.0044*
<i>Shocks</i>							
Death, illness, accident	–0.0039	–0.0115	0.0038	–0.0099	–0.0030	–0.0081	–0.0004
Drought	0.0014	–0.0023	0.0080	0.0239	0.0037	–0.0003	0.0103
Periods of frost	–0.0092	–0.0021	–0.0160	–0.0210	–0.0192	–0.0108	–0.0085
Plagues	0.0085	0.0098	0.0042	0.0276	0.0122	–0.0002	0.0168
Number of observations	8,600	4,466	4,134	4,199	4,401	4,384	4,200

Note: Other covariates have been omitted for convenience, with specification similar to Table 10. Detailed estimation results are reported in a Supplemental Appendix, which is available upon request.

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

*Statistical significance at 10% level.

**Statistical significance at 5% level.

***Statistical significance at 1% level.

Table 12. *Determinants of work incidence among children of age 10–17, by population group (IV probit marginal effects)*

	All	Male	Female	Urban	Rural	Non-poor	Poor
Non-domestic work							
Monthly <i>per capita</i> remittances	–0.0007	–0.0009	–0.0008	–0.0002	–0.0027*	–0.0013**	0.0029
<i>Shocks</i>							
Death, illness, accident	0.0154	0.0063	0.0178	–0.0206	0.0594***	–0.0091	0.0303
Drought	0.0949***	0.0919***	0.1056***	0.0028	0.1048***	0.0308	0.1266***
Periods of frost	0.0968***	0.0633**	0.1229***	0.0735	0.1075***	0.1072***	0.0716**
Plagues	0.0280	0.0483*	0.0030	–0.0177	0.0239	0.0474*	0.0148
Domestic work							
Monthly <i>per capita</i> remittances	0.0005	0.0008	–0.0002	0.0009*	–0.0014	–0.0002	0.0024
<i>Shocks</i>							
Death, illness, accident	0.0070	0.0125	–0.0016	–0.0107	0.0339	0.0075	0.0086
Drought	0.0727***	0.0609***	0.0864***	0.0143	0.0883***	0.0161	0.1060***
Periods of frost	0.0744***	0.0494**	0.1047***	0.0496	0.0961***	0.0761***	0.0733***
Plagues	0.0188	0.0261	0.0120	0.0054	0.0157	0.0141	0.0205
Number of observations	8,600	4,466	4,134	4,199	4,401	4,384	4,200

Note: Other covariates have been omitted for convenience, with specification similar to Table 10. Detailed estimation results are reported in a Supplemental Appendix, which is available upon request.

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

*Statistical significance at 10% level.

**Statistical significance at 5% level.

***Statistical significance at 1% level.

with the education level of households. We control for education level of other household members, and find that the estimated effects of remittances are robust to including the household education variables. This would suggest that the source country does not play a direct role in school investment decisions (see Table 13, columns 1 and 4).

In addition to this, we also estimated a linear probability specification in order to perform Sargan over-identification restrictions tests. For both school enrollment and economic and domestic work, the validity of the instruments was not rejected.¹⁰ Overall, these sensitivity checks and the statistical tests appear to support the validity of the instruments.

The potential endogeneity of the shock variables is another source of concern. Given the number of shock variables, instrumental variables are not a viable option for dealing with this source of unobserved heterogeneity. Given the wide range of individual and regional characteristics in the specification, it is likely that much of the possible bias has been removed. In any case, we find the results are robust to including shock variables, and that remittance estimates are not affected. If any bias would remain, then the effects from shocks would be overestimated.¹¹

5. RESULTS

The impact of remittances on school enrollment and child work is estimated by means of IV probit for the full sample of 8,600 children of age 10–17.¹² The associated marginal effects for monthly *per capita* remittances and shocks are reported in the first columns of Table 11 (enrollment) and Table 12 (work). The remaining columns in these tables show the results for different sub-samples: male/female, urban/rural, and non-poor/poor. The estimates for the specification without shock variables are shown in Table 10.

Remittances increase schooling, in particular that of girls, children in rural areas and among the poor. A \$1 increase in remittances per month leads to a 0.09 percentage point increase in the enrollment rate. Extrapolating this would suggest that, on average, remittances increase enrollment by 2.59 percentage points. While this seems small in terms of enrollment, it is substantial in terms of non-enrollment, as it is equivalent to a 19% decrease of non-enrollment (taking the enrollment rates in Table 5 as baseline). For girls, rural areas, and the poor the effect is larger. While remittances increase school enrollment among the poor, this is not the case for the non-

Table 13. *Sensitivity analysis to choice of control variables and instrumental variables*

	Sensitivity to choice of controls				Sensitivity to choice of instrument	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Excluding shocks</i>						
School enrollment	0.0009**	0.0008*	0.0010**	0.0009***	0.0009**	0.0010**
Non-domestic work incidence	-0.0007	-0.0002	-0.0010	-0.0002	-0.0008	-0.0008
Domestic work incidence	0.0006	0.0011*	0.0004	0.0007*	0.0005	0.0006
<i>Including shocks</i>						
School enrollment	0.0009**	0.0008*	0.0011**	0.0009***	0.0009**	0.0010**
Non-domestic work incidence	-0.0007	-0.0002	-0.0009	-0.0002	-0.0008	-0.0008
Domestic work incidence	0.0005	0.0008	0.0004	0.0007*	0.0005	0.0006
<i>Specification</i>						
Education level in household	Yes	Yes	Yes	No	Yes	Yes
Health-related living conditions	Yes	Yes	No	Yes	Yes	Yes
Regional controls	Yes	No	Yes	Yes	Yes	Yes
<i>Instruments</i>						
Western Union bank offices	Yes	Yes	Yes	Yes	Yes	Control
Source country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Interaction terms	Yes	Yes	Yes	Yes	No	No

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

*Statistical significance at 10% level.

**Statistical significance at 5% level.

***Statistical significance at 1% level.

poor. This suggests that investments in human resources among the poor are bound by resource constraints. At the same time we find that remittances reduce incidence of child work only among the non-poor and in rural areas, suggesting that reservation wages are higher for the non-poor compared to the poor. The marginal effect of remittance is -0.27 percentage point in rural areas and -0.13 for the non-poor. Thus, while remittances may increase human capital investments among the poor, they are not sufficient to offset earnings from child labor, compelling poor households to maintain their income from child labor despite receiving remittances. We find little effect of remittances on domestic work, except for children in urban areas. Here remittances increase the probability of domestic work, which probably reflects increased work pressure in the home due to out-migration of adult family members.

Shocks do not seem to have any effect on schooling, but they do have severe implications for both economic and domestic work activity of children. Especially exposure to covariate shocks increases incidence of child work. Exposure to a drought or period of frost increases economic work incidence by approximately 9.5 percentage points on average (see Table 11). The effects are relatively large for girls in rural areas, and for children from poor households. We observe similar patterns for domestic work, albeit with slightly smaller marginal effects. These results are consistent with the notion that alternative insurance mechanisms are less effective in poor rural environments, hence a relatively larger role for child labor as contingency asset.

Probing the role of trans-national networks and remittances, we estimated the model for sub-samples of children that were exposed to certain shocks and those that were not.¹³ The results are given in Table 14. We find no evidence that remittances reduce the probability that households draw on their children's labor. This is somewhat surprising since the probability of work is sensitive to economic shocks. However, we do find that remittances increase the ability of households to safe-

guard investments in education when faced with these shocks, while schooling itself did not seem sensitive to shocks. For all types of shocks, the effects of remittances are significantly larger for children if their household experienced a shock compared to households that did not.

Summarizing, this evidence suggests that international remittances indeed relax households' budgets constraints such that it can lead to increased investment in education, and that reducing investment in children's education is generally not considered as a coping mechanism by households when faced with unexpected income shocks; at least not in the short term. In fact, remittances serve as an insurance mechanism in order to maintain school enrollment in response to these shocks.

Child work, on the other hand, seems sensitive to shocks, but not affected by remittances. In other words, shocks drive households to fall back on child labor, while remittances are generally not high enough to increase reservation wages such that it reduces child work (except for the non-poor), irrespective of households' exposure to shocks. This would suggest that, like trans-national networks, child labor is just one alternative for consumption smoothing.

The effect of remittances on the choice of public or private school is estimated by means of multinomial logit, where the predicted remittances are used instead of actual monthly *per capita* remittances. Table 10 shows that remittances increase school enrollment mainly through increasing the probability of enrolling into private school (a marginal effect of 0.13, suggesting that an average monthly remittance transfer is associated with a 12.3% increase in private school enrollment, taking enrollment rates shown in Table 6 as baseline). Interestingly, we see this result for all population groups, even where we found no significant effect on school enrollment. For boys, urban areas, and the non-poor, there is a clear substitution effect between public and private schooling, without any effect on overall enrollment. In rural areas and for the poor, remittances lead to an increase in enrollment for both school types, and a substitution effect

Table 14. *Effect of remittances on school enrollment and child work incidence among children of age 10–17, by type of shock (IV probit marginal effects)*

	School enrollment	Non-domestic work	Domestic work	N
No individual shock	0.0004	−0.0011	0.0003	7,253
Individual shock	0.0026**	−0.0004	−0.0001	1,347
No drought	0.0006119	−0.0010	0.0004	6,664
Drought	0.0046**	−0.0001	0.0012	1,936
No periods of frost	0.0009*	−0.0009	0.0007	7,168
Periods of frost	0.0033**	−0.0022	−0.0023	1,432
No plagues	0.0007*	−0.0004	0.0006	6,870
Plagues	0.0067**	−0.0030	−0.0021	1,730
No aggregate shock	0.0005	−0.0009	0.0004	5,996
Aggregate shock	0.0043***	−0.0013	−0.0001	2,604

Note: Other covariates have been omitted for convenience, with specification similar to Table 10. Detailed estimation results are reported in a [Supplemental Appendix](#), which is available upon request.

Source: Authors' analysis based on data from *Encuesta Condiciones de Vida* 2005–06.

*Statistical significance at 10% level.

**Statistical significance at 5% level.

***Statistical significance at 1% level.

from public to private school. For females, the increase in enrollment is due to increased private schooling, with no visible effect on public school enrollment, suggesting that any positive effects for female enrollment into public schools are offset by substitution effects.

6. CONCLUSION

During the last decade, Ecuador has experienced a large increase in financial transfers from international migrants. The scale of the transfers offers an opportunity to analyze the effect of remittances on human capital formation. In particular, through its exploration of the effect of remittances on school enrollment and child work and the role of remittances in mitigating vulnerability to economic shocks, this paper brought together two strands of the literature. The main contribution of this paper is that we provide empirical evidence on the role of remittances as a source for investment in human capital, and the role of remittances and trans-national networks as mechanisms that preserve human capital investments when households are faced with income volatility.

Identification relied on instrumental variables, which exploit information on source countries of remittances and regional variation in the availability of bank offices that function as formal channels for sending remittances. These instruments capture information on transfers costs and accessibility to channels of transmission, which partly determine the volume and frequency of funds transferred, while they are not expected to affect school enrollment and child labor. Over-iden-

tifying restrictions test results and sensitivity analyses are consistent with the validity of the instruments.

Our results showed that remittances increase school enrollment, in particular for girls and in rural areas. To a lesser extent remittances also reduced child labor supply. We further found that especially aggregate shocks are associated with increased work activities. Schooling, on the other hand, did not seem sensitive to shocks, suggesting that households employ other coping mechanisms rather than compromise human capital investments. Besides increasing school enrollment, remittances affected the choice of school type. We found that remittances led to a net substitution from public to private schooling, hence increasing the quality of human capital investments in children.

Not only do remittances provide a source for human capital investments, but trans-national networks also function as insurance mechanism, as we found that remittances are used to maintain education when households are faced with economic shocks. This suggests that liquidity constraints and vulnerability to covariate risk are relevant for human capital accumulation of school age children, especially in rural areas. Within the context of uncertainty both child labor and remittances function as informal insurance coping mechanisms.

A limitation of our study is that the data do not allow us to separate migration and remittance effects; that is, disentangle the effects of investment in trans-national networks (migration) and the returns from these networks (remittances). We intend to pursue this in future research, as well as to explore the endogenous relationship between household risk and remittances.

NOTES

1. The sample was restricted to children for whom we have information on labour market participation and who are still of school going age. In particular, age 10 is the starting point as the survey collects information on work only for children of age 10 and older. In principle, it may be useful to separate primary and secondary education. However, since our sample consists mainly of secondary school age children (age 12–17) and only two cohorts of primary school age children (age 10–11), this would not be feasible. An alternative would be to drop the 10–11 age group altogether and focus solely on secondary school age children. However, we prefer to retain the sample of 10–17-year-olds and not to throw away information. To check

the sensitivity of the estimates to our choice of sample, we repeated the analysis for the 12–17 year age group. The results (not reported here but available in a supplemental appendix), are robust to sample choice. In particular, the estimates for the restricted sample (12–17 age group) are slightly larger and less precise, but within a 95% confidence interval.

2. In 2006, the poverty headcount for Ecuador is estimated at 38.3%, and severe poverty at 12.8% (SIISE, 2007). The quintiles shown in Table 2 are based on monthly *per capita* consumption.

3. Unfortunately the data does not allow us to decompose this further to the different types of expenses.
4. The survey classifies source countries as Spain, the United States, Italy, Andean Community countries (Colombia, Bolivia, Peru, and Venezuela) and other countries.
5. For example, *Asociación de Migrantes Ecuatorianos*, in Spain “Rumiñahui”.
6. School attendance may be sensitive to shocks if households temporarily withdraw children from school to save on variable costs, such as transportation. Thus, children could be enrolled in school and yet not attend school. To examine this we repeated the analysis using school attendance as an outcome variable, instead of school enrolment. These estimates, available in a [Supplemental Appendix](#), show that trends in school attendance closely follow school enrolment, and that the effect on school attendance is very similar to that on enrolment, for all sub-groups of the sample. The marginal effects for attendance are slightly larger, and a little less precise, but within a 95% confidence interval. Given these similarities, we continue to use school enrolment as the main outcome variable.
7. While clearly not causal effects, [Ponce \(2000\)](#) finds that repetition rates and the average number of years needed to graduate are lower in private schools, while [PREAL et al. \(2006\)](#) find lower drop-out rates and better education outcomes (test scores) for private schools compared to public. In addition, the *Sistema Nacional de Estadísticas Educativas del Ecuador 2006–07* reports that private schools enjoy lower student-teacher ratios (10.8 versus 17.7, respectively) and smaller class sizes (16.4 versus 25.1, respectively) than public schools.
8. There is considerable variation between countries in the transaction costs of international money transfers. We called a number of Western Union branch offices in several countries by phone (January 2008), inquiring about the costs of transferring \$100 to Ecuador. The quoted costs amounted to \$11.99 from the United States (Houston), \$7.72 from Spain, \$8.70 from Bolivia, and \$22.50 from Colombia. Rates quoted on the Western Union website for internet transactions of the same amount ranged from \$5.99 in the United States (California) to €14.50 in Italy.
9. First stage estimates are not shown here but in a [Supplemental Appendix](#), which is available upon request. Across all specifications the instruments are jointly significant at a 1% level.
10. The χ^2 test statistics are 15.785, 12.349, and 10.664, respectively, with 10 degrees of freedom and a critical value for rejection at 5% level of 18.307.
11. An additional source of endogeneity could be introduced by control variables reflecting living conditions that may be related to child health, such as having a dirt floor in the house, having access to water from the public network, and having an in-house toilet. Since we included these variables merely as control variables (to capture wealth and socio economic status) and are not directly interested in the coefficients of these variables, we estimated all models with and without these variables. This sensitivity analysis (see [Table 13](#), columns 1 and 3) shows that the results are robust to excluding these variables, with only minor differences that fall well within a 95% confidence interval. We therefore keep these variables in our specification.
12. Wald tests reject the null hypothesis of remittance exogeneity for both the rural and urban sub-samples, but not for the total sample. Nevertheless, given the limited power of the test and evidence of endogeneity for some subsamples, we consider it prudent to rely on the IV estimates, despite its implications for efficiency. In case remittances are not instrumented, we find that the effects of remittances are underestimated and the biased estimates are generally smaller in magnitude. Test results are not shown here but are in a [Supplemental Appendix](#), which is available upon request.
13. We initially experimented with interaction terms of remittances and shock, but our results were sensitive to specification. The more flexible approach, by estimating the effects for different sub-samples, was robust to the choice of instruments. Note that this approach may introduce new confounders for the remittances estimates, even though the results are robust to including shock variables as control variables. In this case the instrumental variables will remove any bias.

REFERENCES

- Acosta, P. (2006). *Labor supply, school attendance, and remittances from international migration: The case of El Salvador*. World Bank Policy Research Working Paper 3903. Washington, DC.
- Acosta, P., Fajnzylber, P., & López, H. (2007). The impact of remittances on poverty and human capital: Evidence from Latin American household surveys. In C. Özden, & M. Schiff (Eds.), *International migration, economic development and policy* (pp. 59–98). New York: World Bank and Palgrave Macmillan.
- Acosta, A., López, S., & Villamar, D. (2005). Las remesas y su aporte para la economía Ecuatoriana. In G. Herrera, M. Carrillo, & A. Torres (Eds.), *La migración Ecuatoriana: Transnacionalismo, redes e identidades* (pp. 227–252). Quito: FLACSO-Ecuador.
- Amuedo-Dorantes, C., & Pozo, S. (2006). Migration, remittances, and male and female employment patterns. *American Economic Review*, 96(2), 222–226.
- Beegle, K., Dehejia, R., & Gatti, R. (2006). Child labor and agricultural shocks. *Journal of Development Economics*, 81(1), 80–96.
- Borraz, F. (2005). Assessing the impact of remittances on schooling: The Mexican experience. *Global Economy Journal*, 5(1), 1–30.
- Cox, E., & Ureta, M. (2003). International migration, remittances, and schooling: Evidence from El Salvador. *Journal of Development Economics*, 72(2), 429–461.
- Dehejia, R., & Gatti, R. (2005). Child labor: The role of financial development and income variability across countries. *Economic Development and Cultural Change*, 53(4), 913–932.
- Dolfin, S., & Genicot, G. (2006). *What do networks do? The role of networks on migration and “coyote” use*. Mimeo, Georgetown University. <<http://www9.georgetown.edu/faculty/gg58/Coyote.pdf>>.
- Funkhouser, E. (1992). Migration from Nicaragua: Some recent evidence. *World Development*, 20(8), 1209–1218.
- Glewwe, P., & Hall, G. (1998). Are some groups more vulnerable to macroeconomic shocks than others? Hypothesis tests based on panel data from Peru. *Journal of Development Economics*, 56(1), 181–206.
- Goycochea, A., & Ramírez, F. (2002). Se fue, a volver? Imaginarios, familia y redes sociales en la migración Ecuatoriana (1997–2002). *Revista ICONOS*, 14, 32–45.
- Halliday, T. (2006). Migration, risk, and liquidity constraints in El Salvador. *Economic Development and Cultural Change*, 54(4), 893–925.
- Hanson, G., & Woodruff, C. (2002). *Emigration and educational attainment in Mexico*. Mimeo, University of California San Diego.
- Herrera, G. (2002). La migración vista desde el lugar de origen. *Revista ICONOS*, 15, 86–94.
- Inter-American Development Bank (2006). *Remittances 2005: Promoting financial democracy*. Washington, DC: Inter-American Development Bank.
- Jacoby, H., & Skoufias, E. (1997). Risk, financial markets, and human capital in developing country. *Review of Economic Studies*, 64(3), 311–355.

- Jokisch, B., & Pribilsky, J. (2002). The panic to leave: Economic crisis and the 'New Emigration' from Ecuador. *International Migration*, 40(4), 75–101.
- López-Córdova, E. (2005). Globalization, migration and development: The role of Mexican migrant remittances. *Economía*, 6(1), 217–256.
- Mansuri, G. (2006). *Migration, school attainment and child labor: Evidence from rural Pakistan*. World Bank Policy Research Working Paper 3945. Washington, DC.
- McKenzie, D. (2005). Beyond remittances: The effects of migration on Mexican households. In C. Özden, & M. Schiff (Eds.), *International migration, remittances and the brain drain* (pp. 123–147). New York: World Bank and Palgrave Macmillan.
- McKenzie, D., & Rapoport, H. (2006). *Can migration reduce educational attainment? Evidence from Mexico*. World Bank Policy Research Working Paper 3952. Washington, DC.
- Miller, D., & Paulson, A. (2007). *Risk taking and the quality of informal: Gambling and remittances in Thailand*. Federal Reserve Bank of Chicago Working Paper WP-07-01. Chicago.
- Morduch, J. (1999). Between the state and the market: Can informal insurance patch the safety net? *The World Bank Research Observer*, 14(2), 187–207.
- Moser, C. (1996). *Confronting crisis: A summary of household responses to poverty and vulnerability in four poor urban communities. ESD studies and monographs series* (Vol. 7). Washington: World Bank.
- Moser, C., & Felton, A. (2007). Intergenerational asset accumulation and poverty reduction in Guayaquil, Ecuador, 1978–2004. In C. Moser (Ed.), *Reducing global poverty: The case for asset accumulation* (pp. 15–49). Washington, DC: Brookings Institution Press.
- Pedone, C. (2000). Globalización y migraciones internacionales. Trayectoria y estrategias migratorias de ecuatorianos en Murcia. *Scripta Nova. Revista Electrónica de Geografía y Ciencias Sociales*, 69(49). <<http://www.ub.es/geocrit/sn-69-49.htm>>.
- Ponce, J. (2000). La eficiencia interna del sistema educativo ecuatoriano. Documentos de trabajo del SIISE No. 9, Quito.
- Ponce, J., Bedi, A., & Vos, R. (2003). Cómo hacer más eficiente el gasto educativo?. In R. Vos (Ed.), *Quién se beneficia del gato social en el Ecuador?* (pp. 89–118). Quito: SIISE, BID, UNICEF and ISS.
- PREAL, Fundación Ecuador, Contrato Social por la Educación y Grupo Faro (2006). *Calidad con equidad: El desafío de la educación ecuatoriana*. Informe de Progreso Educativo Ecuador.
- Ramírez, F., & Ramírez, J. (2005). Redes transnacionales y repertorios de acción migratoria: De Quito y Guayaquil para las ciudades del Primer Mundo. In G. Herrera, M. Carrillo, & A. Torres (Eds.), *La migración Ecuatoriana: Transnacionalismo, redes e identidades* (pp. 71–103). Quito: FLACSO-Ecuador.
- Rapoport, H., & Docquier, F. (2006). The economics of migrants' remittances. In S. Kolm, & J. Mercier (Eds.), *Handbook of the economics of giving, altruism and reciprocity* (pp. 1138–1195). Amsterdam: North Holland.
- SIISE (2007). *Social indicators database version 4.5*. Quito: SIISE.
- Skoufias, E. (2003). Economic crises and natural disasters: Coping strategies and policy implications. *World Development*, 31(7), 1087–1102.
- Taylor, J., Arango, J., Graeme, H., Kouaouci, A., Massey, D., & Pelligrino, A. (1996a). International migration and national development. *Population Index*, 62(2), 181–212.
- Taylor, J., Arango, J., Graeme, H., Kouaouci, A., Massey, D., & Pelligrino, A. (1996b). International migration and community development. *Population Index*, 62(3), 397–418.
- Wamsley, E. (2001). Transformando los pueblos: La migración internacional y el impacto social a nivel comunitario. *Revista Debate*, 54, 155–174.
- Yang, D., & Choi, H. (2007). Are remittances insurance? Evidence from rainfall shocks in the Philippines. *World Bank Economic Review*, 21(2), 219–248.

APPENDIX A. SUPPLEMENTARY MATERIAL

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