

Migration, remittances and poverty in Haiti: Empirical findings based on improved estimation techniques

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Plan of the talk

- Background, research questions and literature
- Econometric challenges for empirical researchers when analyzing the impact of a decision/treatment
- Our methodology to answer the research questions
 - migration decision
 - receipt of remittances
 - impact of receiving remittances on household welfare
- Results
- Conclusions

1. Background

- Haiti is the **poorest country** in the Western hemisphere.
 - Per capita income per annum:
 - \$1,800 (2017) in PPP
 - \$1,222 (2012) in PPP
 - 60% live in (moderate) poverty
- **Poverty lines** (national) in terms of pc income for Haiti:
 - extreme poverty: \$449/year (2017); \$1.23 per day
 - moderate poverty: \$880/year (2017); \$2.41 per day

1. Background (cont'd)

- **Migration:** 1.1 million of the 10.9 million Haitians **work abroad:** In the US, in the Dominican Republic, in Canada, France and the Bahamas
- **Remittances** are a stable source of foreign exchange (22% of GDP)!
- About 25% of all Haitian households receive remittances; remittances contribute substantially to household income. Q20: 38% of hh income ; Q80: 17% of hh income

2a. Data & research questions

- **Data**
 - ECVMAS 2012, a survey on living conditions covering 23,555 (17,807) individuals and 4,930 households
 - Commissioned by the World Bank
- **Research questions:**
 - Who emigrates and what are the drivers of emigration?
 - Which households receive remittances?
 - What is the impact of remittances on household welfare?
 - What is their impact on the welfare of the average hh? What is their impact on poor and non-poor households?
 - What is the average impact of remittances? The average treatment effect, also on the treated?
 - What is the marginal contribution of remittances on welfare?
- How can we control for omitted variables? How can we capture them? How can we capture unobserved individual or hh characteristics?

2b. Literature review

- **Survey-based literature** analyzing the **impact of migration and remittances on poverty or income gains** :
 - Taylor et al. (2005) for Mexico; Adams (2006) and Adams et al. (2008) for Ghana; Yang and Martínez (2006) for the Philippines; Lokshin et al. (2010) for Nepal; Adams & Cuecuecha (2010a) for Indonesia; Adams & Cuecuecha (2010b) for Guatemala; Bertoli & Marchetta (2014) for Ecuador
- **Literature on LAC**: Acosta, Calderón, Fajnzylber; López (2008): large cross-country panel dataset; Orozco (2017): overview article; Adams et al. (2010b) & Bertoli et al. (2014): microeconomic approach
- Main concern in **applied studies**: **Selection bias** between migrants & non-migrants, between remittance receivers & non-receivers
 - Heckman (1979, 2000); Lee (1983); Rosenbaum & Rubin (1983); Wooldridge (1999, 2002): **control function approach**

3a. Challenges in this type of empirical research:

- Control group problem in non-experimental studies: make sure that treatment and control group are as similar as possible
- Self-selection into treatment
- Omitted variable problem (our contribution)

3b. Basic set-up of the study

- **Set-up**
 - First, analysis of the *likelihood to migrate*
 - Second, analysis of the *likelihood to receive remittances*
 - Third, analysis of the *impact of remittances on hh welfare* (approximated by per capita expenditures) & analysis also for quantiles (*ATE & ATET*)
 - Fourth, analysis of *marginal impact of remittances* (value of remittances received)

4. Estimation techniques

- **Step 1: Probit regression on migration**

(17,807 individuals; Φ cumulative standard normal distribution function)

- without control for omitted variables

$$\pi_{ij_mig} = \Phi(w'_{ij}\alpha)$$

- with control for omitted variables

$$\pi_{ij_mig}^* = w'_{ij}\alpha + \left(\hat{\pi}_{ij_event} - \alpha v \hat{\pi}_{event} \right) \chi_1$$

4. Estimation techniques

- **Step 2: Probit regression on receiving remittances (4,930 households)**

$$E(r_j) = z_j' \beta = \pi_{j_remit} = \Phi(z_j' \beta)$$

$$\pi_{j_remit}^* = z_j' \beta + (\hat{\pi}_{j_mig} - a \nu \hat{\pi}_{mig}) \chi_2$$

4. Estimation techniques (ATE/ATET)

- **Step 3: Regression with welfare as dependent variable (per capita expenditures): OLS or TSLS**
 - Regression to compute average treatment effects (ATE & ATET) of remittances

pcexp=F(receiver, HHcharacter, Dept1-10, sectors_worked, x-deviations, omitted variable control)

$$y_j = c + r_j\theta + x_j'\xi + r_j(x_j - \bar{x})'\zeta + r_j(\hat{p} - av\hat{p})\chi_3 + u_j$$

$$Q_{Y_j/RHS_j}(\tau)$$

$$= c + r_j\theta_\tau + x_j'\xi_\tau + r_j(x_j - \bar{x})'\zeta_\tau + r_j(\hat{p} - av\hat{p})\chi_{3\tau} + u_{j11}$$

4. Estimation techniques (marginal effects)

- **Step 4: Marginal effects of remittances (volume received)**

$$y_j = c + rv_j\kappa + x_j'\psi + r_j(x_j - avx)'\lambda + r_j(\hat{p} - av\hat{p})\chi_4 + u_j$$

$$Q_{Y_j/RHS_j}(\tau) = c_\tau + rv_j\kappa_\tau + x_j'\psi_\tau + r_j(x_j - avx)'\lambda_\tau + r_j(\hat{p} - av\hat{p})\chi_{4\tau} + u_j$$

χ_1 **4.1 Probit for migration (Table 1)**

	Migration (1,0) Model 1	Migration (1,0) Model 2	Migration (1,0) Model 3	Migration (1,0) Model 4	Migration (1,0) Model 5
Male	0.17***	0.17***	0.17***	0.18***	0.17***
Steady partner	0.26***	0.26***	0.26***	0.26***	0.28***
HHhead female	0.18***	0.17***	0.18***	0.21***	0.21***
Age of head	0.01***	0.01***	0.01***	0.01***	0.01***
HHhead works	-0.05	-0.03	-0.07	-----	selection
Education of head	0.31***	0.24***	0.26***	0.28***	0.27***
HHsize	-0.03***	-0.02**	-0.03***	-0.03***	-0.03**
Share of dependent HH members	-0.03	0.05	-0.01	0.02	-0.01
Being poor; OVBC	-----	-0.45*** (IV)	-0.33*** [χ_1]	-----	
Being employed; OVBC	-----	-----	-----	1.33*** [χ_1]	
Department dummy	yes	yes	yes	yes	yes
Estimation tech.	eprobit (IV edu)	eprobit (IV poor)	probit by hand (OVBC)	probit by hand (OVBC)	eprobit (endogenous selection)
Obs.	17,807	17,807	17,807	17,327	17,357

Table 2: Probit for receiving remittances

	Remittances (0,1) Model 1	Remittances (0,1) Model 2	Remittances (0,1) Model 3	Remittances (0,1) Model 4
Number of adults in HH	0.12*** (0.01)	0.12*** (0.01)	0.11*** (0.01)	0.10*** (0.01)
# of children under 18 in main HH	-0.07*** (0.01)	-0.07*** (0.01)	-0.06*** (0.01)	-0.05*** (0.01)
Lived in a camp after earthquake	-0.07 (0.05)	-0.04 (0.05)	-0.10* (0.05)	-0.01 (0.06)
Affected by earthquake	0.14 (0.09)	0.15* (0.09)	0.15* (0.09)	0.11 (0.10)
Deviation from mean propensity to migrate [OVBC]	-----	3.94*** [χ ₂] (0.60)	3.55*** [χ ₂] (0.60)	3.99*** [χ ₂] (0.66)
Per capita expenditures, proxy for wealth	0.00*** (0.00)	0.00*** (0.00)	0.00*(IV) (0.00)	0.00*** (0.00)
Constant	-1.05*** (0.05)	-1.02*** (0.06)	-1.19*** (0.07)	-1.28*** (0.06)
Estimation technique	probit (all RHS exogenous)	probit by hand (OVBC; all RHS exogenous)	eprobit by hand (OVBC; pexp endogenous)	eprobit by hand (OVBC; selection endogenous)
Obs	4,930	4,930	4,930	4,930

Table 3: Average treatment effects (ATEs), looking at mean values and quantiles p_{cexp}=F(receiver, HHcharacter, Dept1-10, sectors_worked, x-deviations, omitted var. control)

Dependent variable: Per capita expenditures (welfare)

	Omitted variable bias control [OVBC] (including the correction term; estimating χ_3)				No omitted variable bias control			
Mean or quantiles	ATE (US\$)	ATE _x (US\$)	ATE _{Tx} (US\$)	Relative ATE _{Tx} * %	ATE (US\$)	ATE _x (US\$)	ATE _{Tx} (US\$)	Relative ATE _{Tx} in %
Mean (eq.7)	110***	110***	121***	13%	356***	356***	368***	39%
Q1% (eq. 8)	151***	120***	67***	59%	101***	56***	41***	36%
Q10% (eq. 8)	189***	156***	122***	47%	156***	117***	92***	36%
Q25% (eq. 8)	228***	206***	179***	43%	231***	202***	177***	42%
Q50% (eq. 8)	268***	292***	311***	45%	304***	257***	224***	32%
Q75% (eq. 8)	307***	328***	350***	30%	489***	451***	427***	37%
Q90% (eq. 8)	200***	222***	246***	13%	539***	525***	532***	29%
Q99% (eq. 8)	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

Controls (x): Gender of HHhead, age of head, HHsize, share of dependent HHmembers, hours worked; departments; sectors of work; x-deviations from their mean values

Control for omitted variable bias [OVBC]: HH propensity to receive remittances-average propensity to receive remittances (for receiving HH)

; quantile-average over all HH in this quantile; quantile-average over remittances-receiving HH in this quantile;

* as percentage of either mean or quantile income; mean dependent variable/mean per capita expenditures in US\$: 948 (US\$);

Per capita expenditures per quantile in US\$: Q1%: 114; Q10%: 257; Q25%: 417; Q50%: 691; Q75%: 1,151; Q90%: 1,823; Q99%: 4,469

extreme poverty line: US\$346; moderate poverty line: US\$680; HTG1=\$44 (2012); obs.: 4,930

**Table 4: Marginal impact of remittances,
looking at mean values and quantiles
pcexp=F(remittances_value, HHcharact, Dept1-10, sectors_worked, x-deviations)**

Dependent variable: Per capita expenditures (welfare)

	Omitted variable bias control [OVBC]	No omitted variable control
	Marginal effect (1)	Marginal effect (2)
Regression on the mean	0.80*** [9.22]	1.68*** [19.39]
Q1%	0.34*** [6.32]	0.31*** [3.64]
Q10%	0.44*** [5.08]	0.63*** [5.27]
Q25%	0.82*** [9.58]	1.00*** [12.45]
Q50%	0.93*** [8.42]	1.42*** [13.71]
Q75%	1.09*** [6.68]	2.04*** [10.04]
Q90%	0.97** [2.67]	2.72*** [7.19]
Q99%	n.s.	n.s.

Controls (x):

Gender of HHhead, age of head, HHsize, share of dependent HHmembers, hours worked; departments; sectors of work; for receiving HH: x-deviations from their mean values

Control for omitted variables, OVBC (left panel of Table 4):

HH propensity to receive remittances - average propensity to receive remittances (for receiving HH)

obs.: 4.930

5. Conclusions

- As to the estimation technique, omitted variable control has an impact on regression results
- In particular, the ATE and ATET are affected by omitted variable control, as expected
- The marginal effects are smaller under omitted variable control

5. Conclusions

- Migration is more likely if individuals are male, in a steady partnership; if the hhhead is female; individuals from more educated hh are more likely to emigrate; poor individuals are less likely to emigrate
- The likelihood to receive remittances does not increase with hh wealth; it increases with a higher than average propensity to have a migrant
- The ATE and ATET are almost always positive and significant. The marginal effects increase in higher quantiles.
- The relative ATEs and ATETs are highest for the poorest quantile and then decrease. The poorest 1% cannot be lifted out of extreme poverty; the poorest 10% cease to be extremely poor

Thank you for your attention!