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The Effect of Remittances on Child Labor: Cross-Country Evidence

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Abstract

This paper examines the relationship between migrants remittances and the prevalence of child labor by using a large sample of developing countries. In particular, we investigate whether the inflow of remittances helps to offset the effects of financial constraints and income shocks on the prevalence of child labor. From on a sample of 82 developing countries (of which 31 are African) observed in the year 2000 and after taking into account the endogeneity of remittances, migration and financial development, we show that remittances reduce significantly the prevalence of child labor in developing countries characterized by weak financial systems and by strong income instability. However, we have not found a statistically significant relationship between adults emigration and child labor at home.

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1. INTRODUCTION

This paper analyzes the contribution of migrants' remittances on the reduction of child labor prevalence in developing countries. Using a large sample of countries (82) and after factoring in the endogeneity of migrants' remittances, migration and financial development, our results suggest that remittances are robustly associated to a reduction in child labor. Moreover, we have found that remittances help to reduce child labor prevalence in countries characterized by a low level of financial development and with a high exposure to production per capita shocks.

This is an important question for a number of reasons. Firstly, the problem of child labor is a crucial issue for economic development in the extent to which this strategy has irreversible consequences. Indeed, it is generally difficult for children who have early left school to return even if the economic situation has improved. Just as children who are forced to work several times a week while going to school may have more difficulty than others in the training. Several papers analyzing the factors of child labor in a cross country framework conclude that child labor is positively related to the level of poverty (Krueger, 1996) and to the importance of income shocks (Guarcello et al., 2003; Dehejia and Gatti, 2005; Beegle et al., 2006; Duryea et al., 2007). In contrast, financial development and integration to the global economy through trade and finance are factors of a reduction of child labor (Ranjan, 1999, 2001; Dehejia and Gatti, 2005; Shelburne, 2001; Cigno et al., 2002; Edmonds and Pavcnik, 2006; Neumayer and De Soysa, 2005; Davies and Voy, 2009). However, these macroeconomic studies have in our knowledge, never at this time taken into account another dimension of economic globalization in the discussion. Precisely, it appears that migration and remittances are absent of this macroeconomic literature on the sources of child labor prevalence in developing countries. The literature on the relationship between migration/remittances and child labor or child human capital is essentially microeconometric (Hanson and Woodruff, 2003; Edwards and Ureta, 2003; Lopez-Cordova, 2004; Borraz, 2005; McKenzie and Rapoport, 2006; Acosta et al., 2007; Yang, 2008b; Calero et al., 2009; Bansak and Chezum, 2009). These papers have focused their analyses on the Latin America region and thus, their results cannot be generalized. There is thus a necessity to provide a macroeconomic approach using international and comparable data to address this question.

Secondly, this paper addresses the question of the contribution of migration and remittances on child human capital and child welfare. Remittances are one of the most visible dimensions of the current globalization and recent papers have provided evidence on the fact that remittances might be countercyclical in the sense that they generally react to the economic situation at home (Yang, 2008a; Mohapatra et al., 2009). While the development potential of remittance flows is increasingly being recognized by researchers and policymakers, the effect of remittances on child labor at the cross-country level remains unexplored. Moreover, studies on the relationship between remittances and the labor force participation in developing countries have generally focused on the effects of these flows on the labor participation of adults. The papers there point to a reduction in labor participation in remittances recipients' countries (Kozelt and Alderman, 1990; Itzigsohn, 1995). By analyzing the effects of remittances on the labor force participation of children, our paper is a first effort to try to fill this gap in the literature.

There are several mechanisms through which migration and remittances might affect child labor in developing countries. When households are financially constrained, remittances

might constitute for them an alternative source of funding which help to prevent the entry of children in the labor market. This idea that the marginal efficiency of remittances on indicators of economic development increases with the shallowness nature of the domestic financial system has been put forward by Giuliano and Ruiz-Arranz (2009). Remittances might also reduce child labor prevalence by providing insurance for households against income shocks. Following the conclusion of recent papers which have shown that remittances received by households increase when countries are hit by shocks (natural disasters, conflicts, exchange rates), we can then expected that remittances will increase the ability of household to face shocks and thus reduce the propensity to send children into the labor market.

The net effect of migration on child labor is the combination of the effect of remittances and the direct effect of adults' emigration. While remittances might reduce child labor through the mechanisms describe above, adults' emigration in contrast can increase the probability that a child will work (Bansak and Chezum, 2009). Indeed, when a family member leaves the household to work and send remittances back, there may be disruption due to the loss of a productive adult member of the family. As a result, children may be required to work to offset the market and non-market work performed by the missing adult. To take into account the fact that remittances' effect on child labor might be affected by the direct effect of migration on child labor, we build our empirical models by allowing the presence of emigration rates of adults. Once more to our knowledge, this is the first paper which puts into the same cup, remittances and migration and their respective impacts on child labor using comparable and international data sets.

The rest of the article is organized as follows. Section 2 is devoted to the construction of the econometric model, the presentation of the variables used in this article and estimation method. Section 3 discusses the results. We conclude in Section 4.

2. ECONOMETRIC ANALYSIS

The first model is constructed to test the hypothesis that the marginal efficiency of remittances on child labor reduction increases with the level of financial constraints in developing countries. The second model is devoted to the insurance effect of remittances in a context of production volatility. In each of these two equations, we always control for the direct impact of adults' migration on child labor. We then extend the models of Edmonds and Pavcnik (2006), Dehejia and Gatti (2005) and Davies and Voy (2009) by introducing migration and remittances variables.

2.1 An econometric equation of the relationship between remittances, financial development and child labor

We specify the following equation:

$$cl_i = \alpha + X_i'\beta + \gamma_1 R_i + \gamma_2 R_i * FD_i + \gamma_3 FD_i + \phi M_i + \mu_i + \varepsilon_i \qquad (1)$$

where *cl*, *R*, *FD*, *M* and μ_i represent respectively the rate of prevalence of child labor, remittances as share of GDP, private credit ratio, emigration rate and regional dummies. *i* is the country index and ε_i the error term. The vector *X* contains the traditional determinants of child labor at the macroeconomic level. Thus, we include GDP per capita in a quadratic

form[1], trade openness, rural population, agricultural value added share, size of government (government consumption) and a dummy variable, equal to 1 if, as of 1995 a country had signed the ILO Convention 138 establishing minimum working ages[2]. We also control for the initial level of child labor in each countries (level of child labor in 1960) as well as shocks variables. The rural population, agricultural value added share and the volatility of GDP per capita are expected to be positively related to child labor while trade openness should reduce it following the results of previous works (Edmonds and Pavcnik, 2006, Dehejia and Gatti, 2005). We also expect that child labor rates will be low in countries with high levels of government spending. GDP per capita, trade openness, rural population, agricultural share, government size, private credit ratio and child labor data are drawn from World Bank tables (World Development Indicators, 2004, 2008).

To measure economic volatility we follow Flug et al. (1998) and Dehejia and Gatti (2005) and construct the standard deviation of annual per capita income growth rates in the previous 5 and 10 years. We expect that more children enter the labor force when economic volatility is high. Our hypothesis is that $\gamma_1 < 0$ and $\gamma_2 > 0$ so that the impact of remittances $\gamma_1 + \gamma_2 FD_i$ on child labor is more negative at low levels of financial development.

2.2. An econometric equation of the relationship between remittances, economic volatility and child labor

Do migrants' remittances dampen the effect of economic volatility on the prevalence of child labor? In order to answer this question, the following model is specified:

$$cl_i = \alpha + X_i'\beta + \theta_1 R_i + \theta_2 R_i * Sh_i + \theta_3 Sh_i + \phi M_i + \mu_i + \varepsilon_i \qquad (2)$$

where Sh_i refers to the measure of economic volatility in each country. The model includes the same control variables as before and we test the hypothesis that remittances increase the ability of households to face income shocks. Empirically, we test that the coefficient associated to the interaction between remittances and either indicators of shocks (volatility in the previous 5 or 10 years) is statistically negative. Put differently, we verify that the impact of remittances $\theta_1 + \theta_2 Sh_i$ on child labor is more negative at high levels of volatility.

2.3 Child labor, remittances, financial development and migration data

We measure the extent of child labor as the percentage of the population in the 10–14-year-old age range that is actively engaged in work. These data were compiled by the International Labor Organization (ILO) and are available at 10-year intervals, beginning in 1950 for 172 countries. "Active population" includes people who worked (for wage or salary, in cash or in kind, as well as for family unpaid works) for at least 1 hour during the reference period (International Labor Organization, 1996). The structure of the data does not allow us to infer the intensity of child labor, so we cannot distinguish between light work (which some might argue is beneficial for adolescents) and fulltime labor, which might seriously conflict with human capital accumulation. Moreover, like most official statistics on child labor, these data

[1] We allow for the (log) income to enter the specification nonlinearly because the effects of income on child labor likely differ across poor and rich countries.

[2] Dates of ratification of the ILO Convention 138 can be found at http://www.ilo.org/ilolex/cgi-lex/ratifce.pl?C138.

are likely to suffer from underreporting, because work by children is illegal or restricted by law in most countries, and children often are employed in agriculture or the informal sector. These problems notwithstanding, the ILO data have the advantage of being carefully adjusted on the basis of internationally accepted definitions, thereby allowing cross-country comparisons over time (Ashagrie, 1993). Child labor data for year 2000 are drawn from World Bank Development Indicators (2004).

Remittances data are drawn from the World Bank database (World Development Indicators, 2008). This variable includes three categories: "unrequited transfers" which refer to money sent by migrants to family and friends to the home country, "migrant transfers" which are equal to the net worth of the migrants (considered here as individual's change of residence for at least one year) and finally "compensation of employees" which represent funds sent back by temporary workers who work abroad for less than a year. This database provides information for a lot of countries and over a long period. We use in our estimation the ratio of remittances received by the home country on its GDP.

Financial development is measured as the ratio of domestic credit to private sector provided by deposit banks. Series are drawn from the database compiled annually by Beck, Demirgüç-Kunt and Levine for the World Bank. The choice of this variable to proxy the level of financial development is justified by two important reasons. On the one hand, the dimension of financial intermediation in which we are interested in is the capacity of banks to provide funds to households or firms. On the other hand, the variables retained as exogenous instruments for financial development are more pertinent if financial development is proxied by the credit ratio.

Data on emigration rates come from Docquier et al. (2009) and consist in the emigration rates of each developing country of individuals aged 25+ to OECD in 2000. More precisely, emigration rates are defined as the ratio of the stock of migrants aged 25+ observed in 2000 to the native population with the same age.

Table 1 presents the descriptive statistics for each of the variables used in the estimations. Data concern the year 2000, year for which data on emigration rate of individuals aged 25+ to OECD countries are available.

Table 1: Descriptive statistics

Variables	Obs.	Mean	Std-dev.	Minimum	Maximum
Prevalence of child labor	82	12.89561	14.50189	0	51.13
Remittances	82	3.344394	4.430152	0.014511	21.79848
Private credit ratio	82	27.93375	29.20471	3.838443	177.9058
GDP per capita growth volatility (5y)	82	2.910967	1.989611	0.356830	9.109325
GDP per capita growth volatility (10y)	81	5.138843	4.086954	0.583939	20.76032
Emigration rate of individuals aged 25+	82	4.093543	5.789015	0.067604	34.94054
GDP per capita	82	1650.143	1756.961	120.1141	8270.758
Trade openness	82	22.73487	9.185678	3.785335	49.22613
ILO Convention 138	82	0.243902	.4320773	0	1
Rural population (%)	82	51.8561	20.53585	8.9	87.9
Prevalence of child labor in 1960	82	24.01329	18.96497	0	79.4
Agricultural value added share (% GDP)	82	21.7405	13.2383	2.82874	53.3030
Government size (% GDP)	82	22.7348	9.18567	3.78533	49.2261

2.4. Identification strategy

We propose several instrumental variables for remittances, international migration and financial development following the recent literature on these respective topics.

Remittances

The first instrument is the cost to send $200 remittances to each developing country. This instrument is expected to be negatively correlated to the volume of remittances received. Freund and Spatafora (2008) have addressed this issue using data collected from official money transfers operators. They also have estimated a negative association between remittances and the existence of dual exchange rate in a country. This binary indicator specifies if a country has more than one exchange rate that may be used simultaneously for different purposes and/or by different entities. It comes from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. The second instrumental variable is thus a dummy variable for dual exchange rate.

Emigration of individuals aged 25+

Several microeconometric papers on the impact of migration on child labor have put forward the issue of the endogeneity of migration (Hanson and Woodruff, 2003; Borraz, 2005; Acosta, 2006; Calero et al., 2009). In this paper, international migration is instrumented by three variables of geographical and cultural proximity between the country of origin and the OECD area. Following Docquier et al. (2009) and Abdih et al. (2008), we retain as exogenous determinants of emigration rates: the log of the distance between the departure point and the OECD area, the log of coastal area of a country (defined as the log ratio of the area within 100 KM from a sea or an ocean to the total area of the country) and finally, a dummy variable which takes one when the same language is shared between one country and the OECD countries. Coastal area data are drawn from the works of Gallup et al. (1999), distance and language are taken from a study of the *Centre d'études prospectives et d'informations internationales-CEPII.*

Private credit ratio

Two variables are chosen as instruments for the banks' private credit ratio. They are creditors rights and binary variable on the existence of public (i.e., government-owned) and private credit registries in different countries. These registries collect information on credit histories and current indebtedness of various borrowers and share it with lenders. Djankov et al. (2007) have shown that the level of creditors' right is an important determinant of private credit. In fact, when lenders can more easily force repayment, grab collateral, or even gain control of the firm, they are more willing to extend credit. They have also shown that what matters for lending is information. When lenders know more about borrowers, their credit history, or other lenders to the firm, they are not as concerned about the lemons problem of financing nonviable projects and therefore extend more credit.

Interaction terms

We need also to take into account the endogeneity of remittances crossed with private credit and remittances crossed with volatility. The first variable is instrumented by the product of each instrument of remittances by each instrument of private credit. The second variable is instrumented by the product of remittances' instruments by shocks variables. Indeed

following Calero et al. (2009), we make the assumption that economic volatility is orthogonal to the errors terms in each model of child labor.

3. RESULTS

We present the results of the impact of remittances on child labor. The estimator of the generalized method of moments is preferred than the traditional 2SLS estimator because the first is more efficient in the case of over-identified models and non spherical errors terms.

3.1. Remittances, financial constraints and the prevalence of child labor

The results of the estimation of the model (1) are presented in Table 2 in Appendix. In the first column, we estimate the models without interaction terms. The results of these preliminary empirical specifications suggest that remittances reduce significantly the prevalence of child labor in recipients' countries. While the coefficient associated to the emigration variable appears to be positive, the impact is not statistically significant. The sign of the coefficients of control variables is as expected. Now we turn to the estimation of the heterogeneous impact of remittances. In column 2, we add as control variable, the standard deviation of GDP per capita growth rate in the previous 5 years while in column 3, we present results obtained when volatility is computed from the 10 previous years. Before we discuss the results of the impact of remittances, we need to tell something about the instrumentation equations in these specifications. Table 3 in Appendix presents the instrumentation equation associated to each of endogenous regressors and each specification of the structural model (1). The first four columns of Table 3 present the instrumentation equations derived from the specification in column 2 of Table 2. The last four columns of Table 3 are devoted to the results of the instrumentation equation derived from the specification in column 3 of Table 2. Table 2 presents also diagnostic tests associated to first stage models. As we can see from columns 2 to 3, our instruments are significantly associated to endogenous regressors given the low probability of the F-test statistics in the first stage (see Table 2); so there is no presumption of weak instrument problems in these models. Moreover, the over-identification tests (Hansen OID test) do not reject the hypothesis that our instruments are not correlated with the error terms of structural equations.

We now turn to the discussion of results derived from the estimation of the structural equations. We notice that all explanatory variables have the correct sign and some of them are statistically significant. We observe for example that the quadratic relationship between GDP per capita and child labor prevalence is confirmed by our data (column 2). Indeed, this result had been previously found by Dehejia and Gatti (2005) and Edmonds and Pavcnik (2006). Initial conditions are also a good predictor of child labor given the positive and significant coefficient of child labor in 1960. The rural population and agricultural value added shares are also positively related to the prevalence of child labor whereas the ratification of ILO 138 Convention in 1995 is negatively associated to child labor in 2000 although the coefficient is not statistically significant. Trade openness is no longer significant to explain child labor prevalence in our model, perhaps because we have already control for its specific transmission channel, precisely per capita income (See Edmonds and Pavcnik, 2006). We notice also that child labor decrease with the relative size of governments as we have anticipated.

When we turn to our variables of interest, we observe that remittances and remittances crossed with the private credit are significantly associated to the prevalence of child labor and their coefficients exhibit opposite signs. Moreover, the effect of the private credit ratio on child labor is clear and negative. These results hold whatever the measure of economic volatility included in the models (columns 2 and 3). These results suggest that the marginal efficiency of remittances on child labor reduction increases with the importance of credit constraints faced by households in countries. To ensure that the overall impact of remittances on child labor is statistically significant, we perform an F-test of the joint significance of coefficients associated to remittances and remittances crossed with private credit ratio. The results of this test in Table 2 confirm that the coefficients are jointly significant. We then can make some basics simulations in the basis of these results. Perhaps a better sense of the quantitative significance of the impact of migrants' remittances can be obtained from the following calculation based on the results of column 2 for example. A one standard-deviation increase in remittances ratio (4.43) is associated with a 38% decrease in child labor relative to the mean (12.90%) for a developing country with a credit ratio which corresponds to the 25th percentile of the distribution of the variable (9.97%)[3].

While remittances appear to be negatively associated to child labor in developing countries, we notice from results of columns 1 to 3 that adults' emigration is not statistically related to the international prevalence of child labor. However, the coefficient of this variable is positive although not significant.

3.2. Remittances, economic volatility and the prevalence of child labor

The results of the estimation of the model (2) are presented in Table 2. Two models are estimated depending on the indicator of economic volatility retained. In the fourth column, we present the results when volatility is measured as the standard deviation of GDP per capita growth rate in the previous 5 years. Column 5 presents the results when volatility is constructed on the basis of 10 previous years. The corresponding instrumentation equations are presented in Table 4 in Appendix. Moreover, the diagnostic tests associated to first stage analysis confirm the validity of our instrumental strategy. We notice that our instruments are significantly related to the endogenous regressors given the low values taken by F-test probabilities in the first stage regressions. Moreover, the test of over-identification restrictions suggests an absence of correlation between our instruments set and the error terms in the structural equations.

Regarding the control variables, the U-shaped relationship between GDP per capita and child labor is confirmed once again (column 5). Rural population and agricultural value added shares are factors of child labor. One of the most important results is the fact that volatility is positively and significantly associated to child labor. This result had been previously found by Dehejia and Gatti (2005) in a cross country study and by Calero et al. (2009) in a microeconometric study for Ecuador. We notice also that recent economic shocks (volatility measured using data for the 5 previous years) contribute the most in the expansion of child labor than old shocks (instability using the 10 previous years).

From the results of columns 4 and 5, the insurance role played by remittances is confirmed empirically. Indeed, the interaction terms of remittances crossed with either indicators of economic volatility is statistically significant and negative. This suggests that remittances

[3] The following calculation leads to this impact : (((-1.517*4.43)+(0.0401*4.43*9.97))/12.90)*100 = - 38%

increase the ability of households to face shocks. The F-test of the joint significance of additive and interactive terms with shock variable leads to the conclusion that the total impact of remittances on child labor is statistically significant. On the basis of results obtained in column 4 for example, a one standard-deviation increase in remittances ratio (4.43) is associated with a 22% decrease in child labor relative to the mean (12.90%) for a developing country with a volatility which corresponds to the 75th percentile of the distribution of the variable (4.05%)[4].

Once more, even in this specification, migration is not robustly associated to child labor. However, the coefficient is positive and in conformity with the previous results of Bansak and Chezum (2009) from micro data for Nepal.

4. CONCLUDING REMARKS

Workers' remittances, flows received from migrant workers residing abroad, have become the second largest source of external finance for developing countries in recent years. In addition to their increasing size, the stability of these flows despite financial crises and economic downturns make them a reliable source of funds for developing countries. While the development potential of remittance flows is increasingly being recognized by researchers and policymakers, the effect of remittances on child labor at the cross-country level remains unexplored. This paper is a first effort to try to fill this gap in the literature. We have tested the hypothesis that remittances are more effective in child labor reduction when the constraints faced by households of these countries are high. On the basis of a large sample of developing countries observed in the year 2000, we have shown that the marginal impact of migrants' remittances on child labor increases with the levels of financial constraints and the intensity of income shocks. These results are robust to the correction of endogeneity bias arising from omitted factors, reverse causation, and measurement error in our variables of interest.

Our results suggest that all strategies to facilitate the inflow of remittances in these countries are important for the accumulation of child human capital and a reduction in the prevalence of child labor. Such policies have distinct advantages over other remedies. Compared with legal restrictions and direct bans, it can decrease child labor without lowering household welfare, and it is arguably a simpler goal than general economic development and can have a more immediate impact.

[4] The following calculation leads to this impact : (((1.081*4.43)-(0.427*4.43*4.05))/12.90)*100 = - 22%

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APPENDIX

Table 2: Impact of migration and remittances on Child Labor

Dependent variable : Prevalence of Child Labor : Children aged 10-14	(1)	(2)	(3)	(4)	(5)
Remittances (% GDP)	-0.466*	-1.517***	-1.665***	1.081*	1.669**
	(-1.938)	(-3.280)	(-3.756)	(1.894)	(2.216)
Remittances*Private credit ratio		0.0401***	0.0500***		
		(2.615)	(3.415)		
Remittances*GDP per capita growth volatility (5years)				-0.427*	
				(-1.812)	
GDP per capita growth volatility (5years)		0.337		1.516*	
		(1.166)		(1.664)	
Remittances*GDP per capita growth volatility (10years)					-0.232**
					(-2.156)
GDP per capita growth volatility (10years)			0.0965		0.770*
			(0.614)		(1.816)
Emigration rates of individuals to OECD (aged 25+)	0.280	0.196	0.0773	0.127	-0.0487
	(1.506)	(0.720)	(0.266)	(0.319)	(-0.184)
Private credit ratio (%GDP)	-0.00357	-0.115**	-0.136**	-0.0150	-0.0171
	(-0.130)	(-2.019)	(-2.362)	(-0.335)	(-0.404)
Initial level of child labor	0.446***	0.413***	0.408***	0.339***	0.421***
	(7.902)	(6.561)	(5.821)	(3.872)	(5.637)
GDP per capita (log)	-20.16**	-10.26	-6.860	-4.206	-18.28*
	(-2.385)	(-1.125)	(-0.723)	(-0.375)	(-1.772)
(GDP per capita (log))²	1.236**	0.708	0.550	0.370	1.346**
	(2.236)	(1.171)	(0.847)	(0.477)	(2.045)
Rural Population (%)	0.0892*	0.260**	0.319***	0.145**	0.0335
	(1.769)	(2.438)	(2.922)	(2.209)	(0.469)
Agricultural value added share (% GDP)	0.0127	0.173*	0.206**	0.298*	0.278*
	(0.152)	(1.744)	(2.041)	(1.940)	(1.767)
Government consumption (% GDP)	-0.00668	-0.205**	-0.244***	-0.171**	-0.131*
	(-0.107)	(-2.517)	(-3.215)	(-2.256)	(-1.921)
Trade openness	-0.00506	0.0123	0.0135	-0.0544	-0.00789
	(-0.155)	(0.333)	(0.346)	(-0.851)	(-0.162)
ILO Convention 138		-0.379	-0.0776	-0.502	-0.339
		(-0.280)	(-0.0574)	(-0.243)	(-0.204)
Constant	75.48**	30.53	13.14	3.694	53.23
	(2.278)	(0.819)	(0.358)	(0.0870)	(1.262)
Observations	82	82	81	82	81
Centered R²	0.911	0.855	0.814	0.894	0.900
Joint significance of remittances variables (p-value)		[0.0035]	[0.000]	[0.100]	[0.071]
Remittances instrumentation F-stat (p-value)	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]
Remittances*Private credit instrumentation F-stat (p-value)		[0.037]	[0.023]		
Remittances*Volatility (5y) instrumentation F-stat (p-value)				[0.530]	
Remittances*Volatility (10y) instrumentation F-stat (p-value)					[0.077]
Private credit ratio instrumentation F-stat (p-value)	[0.000]	[0.000]	[0.000]	[0.023]	[0.033]
Emigration to OECD instrumentation F-stat (p-value)	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Hansen OID p-value	[0.158]	[0.435]	[0.591]	[0.731]	[0.537]

Note: Robust t-statistics in parentheses. The GMM estimator has been used in all specifications. Endogenous explanatory variables are: remittances, remittances*private credit, remittances*GDP per capita growth volatility, the private credit ratio, and emigration rate. Remittances are instrumented by the cost to send $200 to each country and by a dummy variable for the existence of dual exchange rate. Private credit ratio is instrumented by the index of creditors' right and by a binary variable on the existence of public (i.e., government-owned) and private credit registries. Emigration rate of individuals aged 25+ to OECD is instrumented by the log distance between each country and the OECD area, by a binary variable of common language shared with at least one member of the OECD area and finally by the ratio of coastal area to the total area. Endogenous interactive variables are instrumented by the product of instruments of each endogenous variables. Regional dummies are included in all models. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Instrumentation equations related to the estimation of model (1)

Variables	R	FD	M	R*FD	R	FD	M	R*FD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dual exchange rates	-3.157	0.00174	5.378	30.76	-3.231	-0.640	5.222	33.15
	(-1.602)	(0.000)	(1.581)	(0.261)	(-1.393)	(-0.0312)	(1.503)	(0.245)
Dual exchange rates*Information	2.246	20.86	-0.614	68.18	3.263	25.04	0.255	163.8
	(0.684)	(1.289)	(-0.218)	(0.492)	(1.010)	(1.389)	(0.0943)	(1.202)
Dual exch. rates*Creditors' rights	0.357	-13.80*	-2.861**	-62.03	-0.0412	-15.27*	-3.174**	-99.06
	(0.282)	(-1.906)	(-2.283)	(-0.967)	(-0.0297)	(-2.005)	(-2.434)	(-1.314)
Cost to send $200	-0.563*	-0.287	-0.511	-4.732	-0.594*	-0.468	-0.535	-10.95
	(-1.677)	(-0.103)	(-1.123)	(-0.232)	(-1.773)	(-0.164)	(-1.172)	(-0.564)
Cost to send $200*Information	0.196	3.368	0.166	12.74	0.209	3.303	0.156	14.08
	(0.665)	(1.315)	(0.445)	(0.817)	(0.705)	(1.246)	(0.414)	(0.906)
Cost to send $200*Creditors' right	0.261	-2.560**	0.424**	-1.140	0.274*	-2.476**	0.433**	2.441
	(1.613)	(-2.292)	(2.122)	(-0.160)	(1.787)	(-2.253)	(2.094)	(0.327)
Information	-2.847	-43.18	-3.747	-151.5	-3.336	-42.55	-3.735	-188.6
	(-0.698)	(-1.161)	(-0.679)	(-0.791)	(-0.810)	(-1.101)	(-0.662)	(-0.988)
Creditors' rights	-3.940*	44.31***	-5.367*	38.83	-4.166*	43.35**	-5.460*	-11.44
	(-1.698)	(2.692)	(-1.869)	(0.340)	(-1.863)	(2.642)	(-1.857)	(-0.0967)
Distance OECD (log)	-4.657*	3.191	-14.69***	-57.40	-4.423*	2.312	-14.64***	-80.73
	(-1.729)	(0.204)	(-3.731)	(-0.468)	(-1.716)	(0.139)	(-3.532)	(-0.632)
lc100km	7.836***	3.735	8.368***	258.3***	7.881***	3.124	8.315***	249.4***
	(5.590)	(0.449)	(3.756)	(3.821)	(5.430)	(0.378)	(3.709)	(3.733)
Common language OECD	-1.429	-4.692	1.086	-45.06	-1.676	-4.286	1.078	-55.65
	(-0.689)	(-0.533)	(0.814)	(-0.360)	(-0.785)	(-0.475)	(0.798)	(-0.415)
Constant	40.63	-108.9	92.79*	949.0	26.26	-108.5	87.23*	606.0
	(1.086)	(-0.581)	(1.952)	(0.679)	(0.699)	(-0.521)	(1.705)	(0.423)
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	82	82	82	82	81	81	81	81
R^2	0.581	0.705	0.655	0.494	0.598	0.703	0.657	0.499

Note: Robust t-statistics in parentheses. R : Remittances in percentage of GDP ; FD : private credit ratio ; M : Emigration rates of individuals aged 25+ to OECD ; Information : binary variable on the existence of public (i.e., government-owned) and private credit registries (Djankov et al., 2007) ; Distance OECD : The log of the distance between the departure point and the OECD area; Common language OECD : binary variable which takes the value one if the country shares the same language with at least one member of OECD; lc100km : Ratio of coastal area (area within 100km of sea/ocean) to total area. All the control variables as well as regional dummies are included in all specifications. *** p<0.01, ** p<0.05, * p<0.1.

Table 4 : Instrumentation equations related to the estimation of model (2)

Variables	R	FD	M	R*Sh (5years)	R	FD	M	R*Sh (10years)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Volatility(5 years)	0.105	5.135	0.144	0.391				
	(0.134)	(0.485)	(0.151)	(0.119)				
Dual exchange*Volatility (5year)	-0.199	-0.0976	-0.273	-1.249				
	(-0.323)	(-0.0202)	(-0.377)	(-0.505)				
Cost $200*Volatility (5years)	-0.00860	-0.385	-0.0250	0.293				
	(-0.155)	(-0.565)	(-0.343)	(0.992)				
Information	0.488	0.452	-1.170	0.227	0.443	0.261	-1.021	-7.726
	(0.463)	(0.0575)	(-0.606)	(0.0472)	(0.404)	(0.0334)	(-0.491)	(-0.801)
Creditors' right	-0.0635	6.233***	0.266	0.616	-0.106	6.648***	0.302	-0.126
	(-0.179)	(2.728)	(0.523)	(0.445)	(-0.280)	(3.031)	(0.554)	(-0.0429)
lc100km	7.539***	2.613	8.746***	18.50**	7.448***	2.838	8.667***	43.34***
	(5.080)	(0.275)	(3.940)	(2.276)	(5.109)	(0.270)	(3.671)	(3.601)
Distance OECD (log)	-4.247	-12.22	-14.08***	-20.24	-4.365	-11.87	-14.40***	-34.51
	(-1.597)	(-0.742)	(-3.662)	(-1.476)	(-1.639)	(-0.622)	(-3.674)	(-1.334)
Common language OECD	-1.159	-0.691	0.774	-3.110	-1.357	-1.864	0.921	-17.30
	(-0.554)	(-0.0732)	(0.619)	(-0.358)	(-0.621)	(-0.191)	(0.738)	(-1.015)
Dual exchange rates	-0.0240	-18.55	0.841	-2.980	0.384	-21.72	1.305	-6.985
	(-0.0114)	(-1.293)	(0.282)	(-0.340)	(0.154)	(-1.579)	(0.353)	(-0.303)
Cost to send $200	0.0512	-1.517	0.451	-0.647	-0.0163	-1.821	0.424	-2.373
	(0.232)	(-0.681)	(0.994)	(-0.897)	(-0.0621)	(-0.983)	(0.851)	(-0.929)
Volatility (10 years)					-0.00524	3.016	0.164	-5.775
					(-0.00687)	(0.525)	(0.161)	(-0.616)
Dual exchange*Volatility (10years)					-0.252	0.620	-0.311	-1.131
					(-0.533)	(0.232)	(-0.496)	(-0.276)
Cost $200*Volatility (10years)					0.0117	-0.239	-0.0152	0.780
					(0.196)	(-0.553)	(-0.206)	(1.109)
Constant	26.23	75.22	87.16*	4.651	21.21	85.80	90.60*	168.7
	(0.676)	(0.355)	(1.968)	(0.0268)	(0.553)	(0.349)	(1.981)	(0.405)
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	82	82	82	82	81	81	81	81
R^2	0.557	0.634	0.609	0.545	0.570	0.628	0.606	0.584

Note: Robust t-statistics in parentheses. R : Remittances in percentage of GDP ; FD : private credit ratio ; M : Emigration rates of individuals aged 25+ to OECD ; Information : binary variable on the existence of public (i.e., government-owned) and private credit registries (Djankov et al. [2007]) ; Distance OECD : The log of the distance between the departure point and the OECD area; Common language OECD : binary variable which takes the value one if the country shares the same language with at least one member of OECD; lc100km : Ratio of coastal area (area within 100km of sea/ocean) to total area; Sh (5years): Standard deviation of GDP per capita growth rate in previous 5 years; Sh (10years): Standard deviation of GDP per capita growth rate in previous 10 years. All the control variables as well as regional dummies are included in all specifications. *** p<0.01, ** p<0.05, * p<0.1.