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Remittances, Institutions, and Inequality in Developing Countries

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ABSTRACT

The private transfers sent by immigrant workers back to their home countries, or remittances, can improve the development of recipient countries through poverty reduction, higher education, and new business formation. However, the effect of remittances on income inequality is still debatable. While some studies suggest that these transfers are sent to the poor, other investigations find that remittances are directed toward higher-income cohorts, widening the gap between rich and poor. This study provides new evidence about potential income inequality reduction driven by remittances and quality of institutions. For instance, weak institutions discourage the usage of remittances toward productive ventures, more so among poor families. Middle- and high-income groups tend to be better prepared to reduce their exposure to the damages of weak institutions. We constructed instrumental variables and completed two-stage least square (2SLS) analysis to address possible causality bias, a problem so pervasive in this type of empirical studies. Using a set of 25 institutional indicators, we find that remittance recipient countries with better institutions have more meaningful reduction in income inequality. This effect is stronger among heavy remittance-recipient countries.

Keywords: Remittances, institutions, inequality, developing countries.

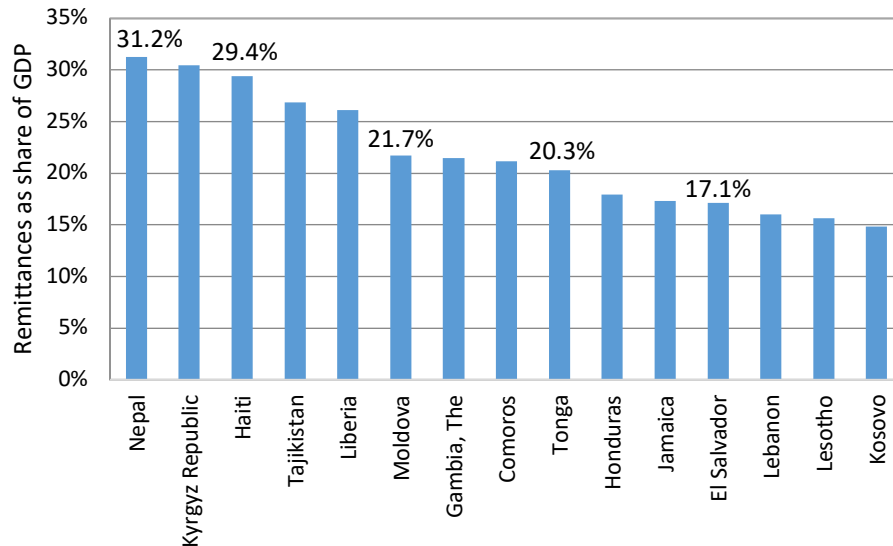
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JEL Classification: D31, F39, O15

1 INTRODUCTION

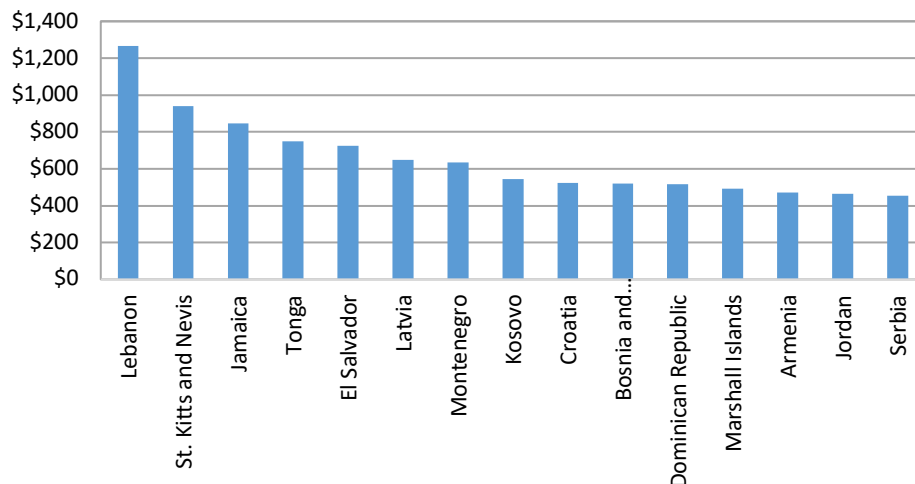
Remittances represent a vital source of income in developing countries. They are known to reduce credit constraints, and improve health, education, and housing among recipient families (Cox-Edwards and Ureta 2003; Acosta 2006; Chaing et al. 2012). Figure 1 reports countries with the highest remittances-to-GDP ratio in 2016. Nepal was highest (31.2%), followed by the Kyrgyz Republic (30.4%) and Haiti (29.4%). From our group of developing countries, 35.9% show remittance-to-GDP ratios above 5%, and 54.2% received more than US\$100 per person in 2016. This source of foreign income can lift entire nations out of extreme poverty, providing more than US\$400 per capita in some recipient countries, such as Armenia, El Salvador, Jamaica, and Lebanon (Figure 2.)

Although remittances can be a notable source of poverty reduction, their effect on income inequality is less evident. Studies using micro-data on migration and remittances have noted that sending family members abroad is expensive, thus, most migration and remittances occur among high-income groups (Adams 1989; McKenzie and Rapoport 2007). However, migration and settlement



Source: Authors' calculation using data from the World Bank, World Development Indicators.

Figure 1: Top remittances receiving countries as a proportion of GDP (2016)



Notes: Authors' calculation using data from the World Bank, World Development Indicators.

Figure 2: Top remittances receiving countries per capita (2016)

expenses eventually decline once networks of immigrants from the same community assist others with job searching and boarding. Ultimately, even low-income families have access to remittances. Declines in income inequality become evident when examining the marginal productivity of remittances among groups. Poor families that use remittances to relax credit constraints and expand small businesses would extract higher productivity per dollar than rich families, which are experiencing lower marginal productivity rates.

The complex relationship between remittances and income inequality is intensified when introducing the quality of institutions. If remittances can reduce inequality through their uses in business development and productive investment, this effectiveness could be hampered by poor resource allocation due to impaired institutional framework.

We conjecture that remittances reduce inequality and do so by a greater extent among countries that pursue institutional improvements. We use multiple econometric techniques to provide robustness to the results. As a first step, panel ordinary least squares (OLS) estimators confirm our hypothesis; however, there is evidence of possible endogeneity bias among this type of studies. Therefore, we construct instrumental variables (IVs) and run two-stage least square regressions (2SLS) to confirm the stability of the results. Our findings indicate that remittances, in the presence of a solid institutional framework, reduce inequality by a greater magnitude. Our results are consistent with previous empirical studies (Acosta et al., 2008; Koechlin and Leon, 2007; Portes, 2009).

The contributions to the literature on income inequality are threefold. First, most studies on remittances and inequality have focused on country-case studies and survey data, diminishing the applicability of policy recommendations to other countries or regions. This study includes 79 developing countries and 25 institutional indicators, providing a more general framework to the analysis. Second, previous studies have focused on a two-dimensional path: remittances and inequality or institutions and inequality, whereas this study analyses the three areas: remittances, institutions and inequality. Third, instead of arbitrarily choosing a narrow set of institutional quality indicators that may produce selection biases, we provide a comprehensive empirical analysis on 25 institutional indicators and their effect on inequality rates.

The remainder of the paper is organized as follows. Section 2 provides a definition of the institutional quality and theoretical background on inequality, remittances, and institutions. In addition, this section includes the most recent literature review on two areas of interest: remittances and inequality, and the complementarity between remittances, institutions, and income inequality. Section 3 develops the empirical methodology, including the regression methods and data description. Section 4 presents the results. Finally, Section 5 offers the concluding remarks and policy implications for developing countries that receive remittances.

2 LITERATURE REVIEW: Institutions, Remittances, and Inequality

2.1 Institutional Quality Indicators

The quality of institutions matters in the economic development of a nation (Keefer and Knack 1995; Mauro 1995). However, it is an ongoing challenge to empirically assess the quality of institutions and to be able to compare institutional indicators among several developing countries. To address this point, we define institutions as the formal rules and organizations governing the political, economic, and social behavior of individuals within the political borders of an economy. In measuring the quality of institutions, we make use of 25 Institutional Quality Indicators (IQI) over a 20-year period in 79 developing countries. Each of these IQI measures has been used extensively in the empirical literature on growth and development (Heckelman and Stroup 2000; Bekaert et al. 2006; Borja 2014).¹

¹ Borja (2014), for example, estimates the interactive and marginal effects of remittances and institutions on long-term growth using 28 institutional indicators for a large set of developing countries. She finds that countries with more developed social capital frameworks can leverage remittances toward economic growth more effectively than those with weaker social capital infrastructure. We adopt a similar set of metrics assessing institutional quality but expand the analysis by examining issues of income inequality.

Using institutional indexes to explain income inequality has some limitations. First, these indexes are, at the most, a gross approximation of the actual quality of institutions since the construction of many IQIs come from survey information on perceptions and opinions rather than actual data. Second, studies empirically addressing the effect of institutions on income inequality have used a single indicator or a narrow set of indicators to account for institutional quality; which introduces a degree of arbitrariness to the analysis. By applying 25 IQI to our study, we attempt to address potential biases arising from these limitations.

We divide the IQIs into three areas: policy enforcement (PE), which includes indicators of corruption, property rights, and regulatory quality; political stability (PS), which concerns government stability, and internal and international conflict; and economic policy (EP), which is comprised of inflation, economic openness, and level of government expenditure. For instance, we use eight political/institutional indexes developed by the Political Risk Service Group in their International Country Risk Guide (ICRG) report. The ICRG indexes have been used amply in previous studies as proxies for political risk and institutional quality and comprise data on more than 140 countries (Keefer and Knack 1995, 2002; Calderon and Chong 2000; Evans and Rauch 2000; Mendez and Sepulveda 2006).

Table 1 provides the list and sources of all indicators included in each area. It also includes the correlation parameter between inequality—measured by the Gini coefficient—and each of the IQIs. Note that higher PE and PS values reflect higher institutional quality. Appendix 1 provides detailed information regarding the construction, source and coverage for each IQI.

Table 1: Institutional quality indicators - correlations with the Gini coefficient

Category		Institutional Quality Indicator	Correlation	Obs
		Remittances	-0.110*	315
Policy Enforcement (PE) Indicators	1	ICRG-Corruption	0.170**	209
	2	ICRG-Law and Order	-0.182***	209
	3	ICRG-Bureaucracy	0.096	209
	4	ICRG-Quality Institutions	0.018	209
	5	WGI-Regulatory Quality	0.312***	186
	6	WGI-Rule of Law	-0.012	186
	7	WGI-Corruption	0.188***	186
	8	HF-Economic Freedom Index	0.399***	189
	9	HF-Property Rights	0.187***	189
	10	HF-Freedom from Corruption	0.238***	189
	11	FI-Legal Structure/Property Rights	-0.011	215
	12	TI-Corruption Perception Index	0.229***	130
Political Stability (PS) Indicators	13	ICRG-Government Stability	-0.117*	209
	14	ICRG-Internal Conflict	0.073	209
	15	ICRG-External Conflict	0.158**	209
	16	ICRG-Ethnic Tensions	0.226***	209
	17	Polity IV	0.418***	225
	18	WGI-Voice and Accountability	0.378***	186
	19	WGI-Absence of Violence	0.255***	186

	20	WGI-Government Effectiveness	0.150**	186
Economic Policy (EP) Indicators	21	WBDI-Government Consumption	0.368***	232
	22	WDI-Money Growth (M2)	0.089	232
	23	FI-Black Market Exchange Rate	0.222***	219
	24	FI-Tariff	0.467***	218
	25	WBDI-Openness	0.128*	231

Notes: A detailed explanation of each index is presented in the Appendix 1. WBDI: World Bank Development Indicator; ICRG: International Country Risk Guide (The Political Risk Service Group); WGI: Worldwide Governance Indicators; HF: The Heritage Foundation; FI: Fraser Institute; TI-Corruption Perception Index: Transparency International. The values refer to pairwise correlations between each institutional quality indicator and the Gini coefficient as well as the number of observations. *** denotes significance at the 1% level, ** at the 5% level, and * at the 10% level. The Gini coefficient is in natural logs.

2.2 Inequality and Remittances: The Theory

Leading research in the area of migration, remittances, and inequality provides the theoretical framework for our empirical analysis. In a model developed by Docquier and Rapoport (2003), and further developed by Shen et al. (2010), an economy has two types of households with multiple income sources. The households differentiate themselves by type of productivity (e.g., high and low productivity), which in turn depends on the quantity and quality of inherited assets (e.g., land and machinery). That is, low-productivity households show greater liquidity and asset constraints. Each household maximizes utility subject to a budget that is relaxed in the presence of remittances.

An expanded budget increases wealth for both types of households, but those with lower initial asset endowment and higher marginal productivity of capital evolve to a higher steady state, reducing the income gap between household types. That is, remittances allow access to productive assets and inputs, moving households to the high-productivity type with income-equalizing effects. Thus, in the long run, the Shen et al. (2010) model predicts that remittances reduce inequality. In the short term, however, remittances might increase or decrease the income gap. For instance, households with higher asset endowments are better equipped to send family members abroad, which is an expensive endeavor during the initial periods of migration (Adams 1989). Empirically, some studies have confirmed that higher inequality is only a temporary stage since eventually, migration costs can be reduced owing to social networking and assistance from well-established communities in the host country, making migration more affordable for low-income families (Borja 2013; Taylor et al. 2003; Woodruff and Zenteno 2007).

In summary, the theory on remittances and inequality provides an inverted U-shaped pattern, in which remittances initially increase the income gap between households, but eventually reduce inequality (Stark et al. 1986). Empirically, however, the relationship between remittances and inequality is more elusive.

2.3 Inequality, institutions, and Remittances: The Empirics

Remittances are a central pillar in the economic sustainability of many developing nations. At the country level, these transfers reduce balance of payment deficits, expand economic growth, and are much more stable source of income than foreign direct investment (World Bank 2006; Borja 2012a). At the household level, remittances reduce poverty and improve the level of health,

education, and consumption of recipient families (Frank and Hummer 2002; Cox-Edwards and Ureta 2003; Adams and Page 2005; Giannetti et al. 2009).

However, these foreign inflows may lead to perverse effects on income inequality in the short term. Country surveys indicate that only better-off families are able to raise the funds necessary to pay the strenuous travel expenses to send family members abroad, increasing intra-community inequality (Stark et al. 1986; Adams 1989). In addition, remittance recipient families have the opportunity to access private healthcare, to keep children in school for longer periods of time, and to acquire investment and productive assets (Acosta 2006; Amuedo-Dorantes and Pozo 2006; Woodruff and Zenteno 2007). If these resources are received mostly by middle to upper-income households, remittances may lead to an increase in income inequality.

Stark et al. (1986) and (1988) compare the direct effect of remittances on income inequality for two Mexican villages with different remittances-to-total income ratios. The Gini coefficient is disaggregated using non-remittance income and total income (including remittances). In both villages, inequality is reduced, and more so in the village with higher remittance-to-income ratio. However, remittances were unevenly distributed among income groups in the village with lower migration ratio, with high income families taking up most of the remittance proceeds.

Taylor (1992) also explores the relationship between remittances and the Gini coefficient –as a measure of income inequality– by collecting information on farmers in Mexico. Groups of families were interviewed in 1983 and 1989, allowing for matched longitudinal data. His finding indicates that remittances increase income inequality among rural households. This effect is stronger in earlier years, but fades away in more recent years, providing empirical evidence of an inverted U-shaped relationship mentioned above.

Taylor and Wyatt (1996) test the direct and the shadow effect of remittances on income inequality. Using the same data from Taylor (1992), they found that remittances have a positive effect on income, but this effect is larger among poor households with illiquid assets and credit constraints, reducing the income gap between poor and rich families.

Using income and other demographics from three villages in Egypt, Adams (1989) developed a predictive model of family income distribution that includes remittances. He found that the predicted mean income in the bottom group increased by merely 0.18 percent when adding remittances, while the predicted mean income for the top quintile increased by 10.1 percent, widening the income gap among groups. Following the same approach, Barham and Boucher (1998) found that remittances increase the gap among income groups for the case of three communities in Nicaragua.

McKenzie and Rapoport (2007) also argue that migration is expensive. Families must incur the direct costs of settlement and job searching in the host countries. Thus, in the first stages of migration, only wealthier families have the means to send members abroad and be rewarded with remittances. As more migration occurs and new networks of migrants are developed, the costs of

migration can be reduced, and lower-income families can also enjoy remittance inflows.² Using data on 57 communities from 13 Mexican states, these authors corroborate that initial migration is observed among middle to upper income groups; which would eventually become the recipients of remittances. Their main conclusion is that the effect of remittances on income inequality is subjected to the migration history of the community.

Acosta et al. (2008) provide an extensive comparative study on remittances and inequality using both macro data (balance of payments statistics) and micro data (national surveys) for Latin America. This detailed investigation of 10 nations is unable to provide clear demographic patterns among remittance recipient households. For example, under the micro-data scope, some migrants come from lower-income brackets (El Salvador, Guatemala, and Mexico), while others come from the highest-income cohorts (Haiti, Nicaragua, and Peru). From the econometric analysis using macro-data (59 developed and developing countries), they found that remittances tend to increase inequality, although the magnitude is relatively small. Once the Latin America region is controlled for, the estimator changes sign, suggesting that remittances actually reduce inequality for the region. The authors attribute the positive impact of remittances on inequality to lower migration costs in Latin America, mostly due to the short distance to the largest host country (the U.S.), and well-developed migrant networks of Hispanic communities in the U.S.

Using a large set of countries, Portes (2009) concludes that remittances have a greater equalizing effect in low income countries compared to the entire sample. When focusing on specific income groups – deciles – remittances increase the income of those in the lowest decile group, and this effect declines for higher income deciles.

In summary, the literature on the effects of remittances on income inequality is inconclusive, particularly in the short-term framework. However, in the long run, once the migration communities help new immigrants to settle, remittances are more evenly distributed among all groups, providing an effective source of reducing income inequality.

In the case of institutions, Koechlin and Leon (2007) estimated the effects of remittances on income inequality –measured by the Gini coefficient– when quality of institutions is incorporated in the analysis. Education, democratic progress, and financial development are used as a way to assess the role of institutions. Koechlin and Leon's (2007) findings show that institutions “can help countries to reach more quickly the point at which international remittances begin to reduce inequality.” (pp. 127). Specifically, they find remittances to have an equalizing effect in countries with a remittances-to-GDP ratio greater than 1.4 percent.

Calderon and Chong (2000) compile a set of institutional indexes from the ICRG and the Business Environmental Risk Intelligence (BERI) for about 80 countries to determine the link between institutions and inequality over the period 1970-1995. The authors find a nonlinear relationship between institutions and inequality in which each index exhibits a positive coefficient while its squared value shows a consistent negative coefficient over different cross-sectional models. The reasoning is that in the first stages of development, institutional quality does not matter much in

² Massey and Espinosa (1997), Munshi (2003), and Borja (2013) provide evidence for the costs associated with migration as well as the benefits from well-developed social networks and organizations of immigrants in the host countries.

reducing inequality. Later, Calderon et al. (2009) find poor evidence that the quality of institutions plays a role in the effectiveness of foreign aid on income inequality.

As Table 1 shows, there is a significant and negative correlation between remittances and inequality (corr = -0.110). However, the correlations between income inequality and institutional indexes exhibit a wide range. While the ICRG-Law and Order shows a negative correlation with the Gini coefficient (corr = -0.182), the ICRG-Ethnic Tensions and WGI-Absence of Violence display positive values (corr = 0.226 and corr = 0.255, respectively), supporting the diverse relationships between quality of institutions and income inequality as observed in Calderon and Chong (2000).

3 DATA AND METHODOLOGY

We construct an unbalanced dataset of 79 developing countries over a 20-year period from 1990 to 2010, broken into 4-year non-overlapping periods.³ Appendix 2 provides the list of countries used in this study.

We proceed by testing the effect of remittances on income inequality, controlling for education and economic development without the institutional quality indicators. Subsequently, we determine if the remittance parameter increases once controlling for the institutional quality indicators in a series of regressions, using a single IQIs in each regression. For instance, we test whether a less corrupt society could leverage remittances toward an improved distribution of income. In this case, remittances would lift the income of the poor in a more significant way than it would those at the top of the income hierarchy.⁴ The baseline econometric model for our unbalanced panel dataset is presented in Equation (1).

$$Gini_{i,t} = \beta_0 + \beta_1 GDPpc_{i,t} + \beta_2 GDPpc_{i,t}^2 + \beta_3 EDU_{i,t} + \beta_4 REM_{i,t} + \gamma_i + \varepsilon_{i,t} \quad (1)$$

where $Gini_{i,t}$ is the natural log Gini coefficient for country i at time period t ; $GDPpc_{i,t}$ is the natural log of the real GDP per capita; $GDPpc_{i,t}^2$ represents the squared value of the natural log of the real GDP per capita; $EDU_{i,t}$ is the natural log of education, defined as the percentage of population who completed secondary school; and $REM_{i,t}$ is the natural log of remittances in current US\$. The parameter γ_i is the unobserved between country effect, and ε is the error term.

Equation (1) measures the effect of remittances on the Gini coefficient, after controlling for education, gross domestic product (GDP) per capita, and its squared value. These control variables are consistent with the broader literature on income inequality (Milanovic 1994; Deininger and

³ Limitations in data availability defined our period of study. With 4-year periods, each country has six observations starting 1990. See Leon-Gonzalez & Montolio (2015), Borja (2014), Leon-Gonzalez and Vinayagathan (2013) and Chen et al. (2011) regarding the use of 4-year non-overlapping time intervals.

⁴ Multicollinearity is a concern in empirical specifications with multiple indexes, thus, instead of completing a single regression with all 25 IQIs, we construct 25 regressions. An alternative approach is to combine a set of IQIs into a single "pooled" index; however, this would require subjective calls on which of the 25 indicators are pooled together and the weight of each IQI in the new pooled index. Although, we completed this exercise, these regressions may suffer from serious endogeneity bias. In addition, we run three series of regressions: (1) a regression with all PE-IQI, (2) a regression with the PS-IQI, and (3) a regression with the EP-IQI. The remittance parameter is consistently negative in all cases.

Squire 1997; Li et al. 1998; Calderon and Chong 2000). The squared GDP value controls for the inverted U-shaped dynamic of inequality during the course of development as described in Kuznets (1955) and Barro (2000). The inclusion of an education variable accounts for the significant negative relationship between human capital investment and inequality observed in DeGregorio and Lee (2002). Sources of the data are presented in Appendix 1.

An empirical challenge in equation (1) is the presence of possible endogeneity between inequality and remittances. It is costly to send a family member abroad, and thus, it is possible that remittances will be captured only among high-income households. This suggests that remittances are endogenous and partially determined by the pre-existing distribution of family income levels. To address endogeneity, we use instrumental variables (IV) and run two-stage regression estimates. An effective IV should have a causality effect with the endogenous variable (remittances), but limited direct effect over the dependent variable (the Gini coefficient). One approach in the construction of a suitable IV is to use information on the U.S. GDP. Borja (2012b), Borja (2013) and Ziesemer (2006) demonstrated that the GDP and unemployment rate of the U.S. are likely to affect the volume of remittances that immigrant workers can send to their home countries. Since the U.S. represents the largest remittance-source country, it is anticipated that this economy affects the remittance flows of many developing countries in our sample. At the same time, it is expected that the U.S. GDP will have limited effects on the income inequality of remittance-recipient countries. Following Borja (2014)'s method, we construct an IV as shown in Equation (2).

$$IV1_{i,t} = \frac{REM_{i,t}}{GDP_{US,t}} \quad (2)$$

where $REM_{i,t}$ is the log value of remittances for country i , and $GDP_{US,t}$ denotes the log value of US GDP at time t . $IV1$ is the ratio of remittances of country i as a share of US GDP. This type of IV has also been used in the literature by Aggarwal et al. (2006) and Chami et al. (2008).

Lueth and Ruiz-Arranz (2006) use a gravity model to further explain bilateral remittance flows. They conclude that more than 50% of remittance flows can be accounted for by the immigrant-host country's GDP values and the distance between host country and remittance-recipient country. Based on this finding, we develop a second IV that incorporates the business cycle of the largest remittance-sending countries weighted by the proximity between the remittance sending and recipient countries from our sample.

This second instrumental variable (IV2) is similar to IV1, but instead of using the U.S. as the only remittance-source country, IV2 incorporates the GDP of the 14 largest remittance-source countries. The business cycle in the U.S. may be more relevant to Central American and South American countries, but less so for countries further away from the U.S. The second IV aims to control for this geographic difference by placing greater weight to the largest remittance-sending countries in close proximity to the recipient country. To avoid arbitrariness in the influence that these 14 countries' business cycle exerts over the remittances of recipient countries, we weight each source country according to the distance to the recipient country. Thus, the GDP of a source country that is close to a recipient country will have more relevance in explaining remittances. The weights sum to unity. The reasoning stems from the gravity model literature, in which bilateral flows of trade (in our case, remittances) become larger the closer the geographical proximity among countries. The implication is that remittances received by the developing country are more dependent on the

business cycle of a country closer in distance. The approach is similar to that used in Acosta et al. (2008) in which the author constructs an instrumental variable based on the distance to the top ten migrant receiving countries. Equation (3) now describes our second IV:

$$IV2_{i,t} = \frac{REM_{i,t}}{\sum_{k=1}^{14} W_k * GDP_{k,t}} \quad (3)$$

where $k = 14$ represents the top 14 remittance-sending countries⁵; W_k is the weight given to country k determined by the distance between country i and country k ; and i is equal to the 79 recipient remittance countries from our sample; t denotes the time period; and $GDP_{k,t}$ is the real GDP of country k at time t ⁶.

Subsequently, each institutional indicator is incorporated in the regression to test whether remittances have a larger impact on reducing inequality. The empirical specification is similar to Equation (1) and is presented in Equation (4).

$$Gini_{i,t} = \beta_0 + \beta_1 GDPpc_{i,t} + \beta_2 GDPpc_{i,t}^2 + \beta_3 EDU_{i,t} + \beta_4 REM_{i,t} + \beta_5 IQI_{j,i,t} + \gamma_i + \varepsilon_{i,t} \quad (4)$$

for $j = 1, \dots, 25$

where $IQI_{j,i,t}$ is the Institutional Quality Indicator j for recipient country i at time t . The remaining variables are consistent with those used in Equation (1).

4 RESULTS: Remittances Reduce Income Inequality

4.1 All 79 developing countries

Table 2 displays the results from Equation (1). The remittance parameters show a steady negative value among the three models, supporting our initial hypothesis that remittances reduce inequality. The Kuznets hypothesis in which the squared GDP value controls for the inverted U-shaped dynamic of inequality during the course of development is corroborated by the positive values of the GDP per capita and the negative values of the squared GDP per capita (all three models in Table 2). As expected, education decreases inequality, but this parameter is statistically insignificant in all models.

Our baseline results show an equalizing effect of remittances after controlling for the Kuznets hypothesis and education. Portes (2009) also uses a panel dataset of developing countries to estimate that a one percent increase in remittances increases the income of the bottom decile by 0.43 percent and decreases the income of the top decile by 0.10 percent resulting in a reduction in

⁵ The top remittance-sending countries that sent in excess of US\$5 billion dollars of remittances in 2009 are: United States, Saudi Arabia, Switzerland, Russia, Germany, Italy, Spain, Luxembourg, Kuwait, Netherlands, Malaysia, Lebanon, Oman and France (World Bank, 2012).

⁶ The weights used in IV2 are based on the distance from a remittance-recipient country i to the fourteen highest remittance-sending countries k . Specifically, the weight given to country k is calculated based on the distance from country i to country k divided by the sum of distances from country i to all fourteen k countries. The inverse of this ratio, which is larger as the i country is closer to k country, is used to allocate more weight towards those k countries geographically closer to i country, as remitters tend to be concentrated on these countries. The sum of the weights equals one.

Table 2: Remittances and income inequality under OLS and 2SLS

Variable	Panel OLS (1)	2SLS-IV1 (2)	2SLS-IV2 (3)
REM	-0.025** (-2.39)	-0.023** (-2.20)	-0.032*** (-2.93)
GDPpc	0.915*** (3.22)	0.914*** (3.21)	0.920*** (3.22)
GDPpc ²	-0.055*** (-2.96)	-0.055*** (-2.95)	-0.056*** (-2.98)
EDU	-0.083 (-1.46)	-0.086 (-1.51)	-0.071 (-1.24)
Constant	0.924 (0.92)	0.901 (0.90)	1.007 (1.00)
Wald stat- χ^2 (p-value)		25.44*** (0.000)	29.07*** (0.000)
Cragg-Donald stat-F (p-value)		977.74*** (0.000)	312.35*** (0.000)
Hausman stat- χ^2 (p-value)		1.65 (0.799)	6.23 (0.183)
Observations	198	198	198
R-Squared	0.302	0.301	0.297

Notes: *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. The dependent variable is the Gini Coefficient. All variables are in logs and t-statistics are provided in the parentheses. The Hausman test compares the estimators from the OLS model and the 2SLS models where the null hypothesis is that the estimators from the 2SLS are efficient and consistent as those from the OLS estimators. The Wald test confirms the IVs are exogenous and the Cragg-Donald statistic tests the strength of the IVs.

income inequality. Our baseline results are consistent with this finding, though somewhat more modest when using the Gini coefficient as opposed to income deciles to measure inequality. Specifically, we estimate a one percent increase in remittances reduces the Gini coefficient between 0.025 and 0.083 percent for all developing countries depending on the institutional quality measure and instrumental variable. Acosta et al. (2008) find a similar result for ten Latin American countries concluding that a one percent increase in the share of remittances to GDP will reduce inequality between 0.06 and 0.12 percent for the typical country in that region.

Remittances reduce inequality; but do they reduce inequality more effectively once controlling for the institutional environment in the recipient nation? Table 3 presents a set of regressions that include a PE indicator (WGI – Rule of Law), a PS indicator (WGI – Absence of Violence), and an EP indicator (FI – Black Market Exchange Rate) under panel OLS, 2SLS-IV1, and 2SLS-IV2.

Comparing Tables (2) and (3), we observe that the inclusion of the institutional quality indicator increases the marginal effect of remittances on inequality. For example, when controlling for the PE indicator, WGI - Rule of Law, the marginal impact of remittances increases from -0.025 (Table 2) to -0.035 (Table 3). Similar results of a statistically significant increase in the marginal effect of remittances are displayed with the PS and EP indicators (WGI – Absence of Violence and FI – Black Market Exchange Rate, respectively). This result is consistent in magnitude with Koechlin

and Leon (2007), also finding an inequality reducing effect of remittances after controlling for financial stability in countries with a sufficiently high remittance-to-GDP ratio.

Table 3: Remittances, institutions, and income inequality

Variable	Panel OLS (1)	2SLS IV1 (2)	2SLS IV2 (3)	Panel OLS (4)	2SLS IV1 (5)	2SLS IV2 (6)	Panel OLS (7)	2SLS IV1 (8)	2SLS IV2 (9)
REM	-0.035*** (-3.08)	-0.033*** (-2.88)	-0.043*** (-3.65)	-0.029** (-2.33)	-0.027** (-2.10)	-0.040*** (-3.05)	-0.027*** (-2.69)	-0.025** (-2.45)	-0.034*** (-3.24)
GDPpc	0.674** (2.17)	0.675** (2.18)	0.670** (2.15)	0.783** (2.65)	0.781*** (2.64)	0.792*** (2.66)	0.867*** (3.16)	0.868*** (3.16)	0.865*** (3.14)
GDPpc ²	-0.040* (-1.93)	-0.040* (-1.93)	-0.040* (-1.92)	-0.048** (-2.46)	-0.048** (-2.45)	-0.049** (-2.49)	-0.053*** (-2.95)	-0.053*** (-2.94)	-0.053*** (-2.95)
EDU	-0.029 (-0.48)	-0.033 (-0.54)	-0.012 (-0.20)	-0.049 (-0.83)	-0.054 (-0.91)	-0.030 (-0.50)	-0.057 (-1.04)	-0.061 (-1.12)	-0.044 (-0.80)
WGI-Rule of Law	-0.052 (-1.15)	-0.051 (-1.12)	-0.056 (-1.24)						
WGI-Abs. Violence				0.024 (0.71)	0.027 (0.79)	0.011 (0.32)			
FI-Black Market							0.028** (2.54)	0.028** (2.54)	0.028** (2.54)
Constant	1.805* (1.68)	1.774* (1.65)	1.930* (1.79)	1.450 (1.39)	1.423 (1.37)	1.570 (1.50)	0.843 (0.86)	1.684 (1.51)	0.949 (0.96)
Wald stat (p)		24.58 (0.000)	29.48 (0.000)		23.64 (0.000)	28.26 (0.000)		32.45 (0.000)	36.76 (0.000)
Cragg-Donald (p)		719.51 (0.000)	230.27 (0.000)		722.36 (0.000)	203.94 (0.000)		795.65 (0.000)	232.18 (0.000)
Hausman χ^2 (p)		1.50 (0.913)	6.81 (0.236)		1.62 (0.899)	7.51 (0.186)		2.78 (0.734)	6.61 (0.251)
Obs.	162	162	162	162	162	162	185	185	185
R ²	0.305	0.311	0.306	0.302	0.282	0.293	0.380	0.379	0.375

Notes: *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. The dependent variable is the Gini Coefficient. All variables are in logs and t-statistics are provided in the parentheses. The Hausman test compares the estimators from the OLS model and the 2SLS models where the null hypothesis is that the estimators from the 2SLS are efficient and consistent as those from the OLS estimators. The Wald test confirms the IVs are exogenous and the Cragg-Donald statistic tests the strength of the IVs. The (p) means p-values.

Table 4 extends Table 3 by presenting the remittance parameter value when including each of the 12 IQI-PE indexes. Table 4 shows only the parameter value of remittances and its significance. The parameter values for GDP per capita, its square value, education and each of the 12 IQIs are suppressed for clarity purposes.⁷

Remittances significantly reduce income inequality when controlling for the Policy Enforcement (PE) indicators (Tables 4). For instance, once including TI-Corruption Perception Index in equation (4), the marginal effect of remittances increases from -0.025 to -0.042 under panel OLS (Table 4, Column 1, Rows 1 and 12); from -0.023 to -0.039 under *IV1* (Table 4, Column 2, Rows

⁷ The econometric results and parameter values of EDU, GDP, and GDPsq from Tables 4–6 remain fairly stable over all regressions and can be provided by the authors upon request.

Table 4: Remittances, income inequality, and policy enforcement (PE)

	IQI-PE	Panel OLS (1)	2SLS-IV1 (2)	2SLS-IV2 (3)
	REM	-0.025**	-0.023**	-0.032***
1	REM / ICRG-Corruption	-0.024**	-0.023**	-0.032***
2	REM / ICRG-Law and Order	-0.027**	-0.025**	-0.033***
3	REM / ICRG-Bureaucracy	-0.026**	-0.025**	-0.034***
4	REM / ICRG-Quality Institutions	-0.026**	-0.024**	-0.032***
5	REM / WGI-Regulatory Quality	-0.030***	-0.028***	-0.039***
6	REM / WGI-Rule of Law	-0.035***	-0.033***	-0.043***
7	REM / WGI-Corruption	-0.032***	-0.030**	-0.042***
8	REM / HF-Economic Freedom Index	-0.028***	-0.026**	-0.034***
9	REM / HF-Property Rights	-0.026**	-0.024**	-0.034***
10	REM / HF-Freedom from Corruption	-0.027**	-0.025**	-0.034***
11	REM / FI-Legal Structure /Property Rights	-0.028**	-0.027**	-0.035***
12	REM / TI-Corruption Perception Index	-0.042***	-0.039**	-0.049***
	Significant Increase in the Magnitude of Remittances	11/12	11/12	12/12

Notes: *** denotes significance at the 1% level, ** at the 5% level, and * at the 10% level. The dependent variable is the Gini Coefficient. All independent variables are in logs. The t-statistics are suppressed for clarity but the asterisks correspond to the level of significance. The last row reflects the number of cases in which the IQI significantly increase the marginal effect of remittances when compared to values in row one.

1 and 12); and from -0.032 to -0.049 under *IV2* (Table 4, Column 3, Rows 1 and 12). Similarly, when controlling for the WGI-Regulatory Quality Index, the remittance parameter increases from -0.025 to -0.030 under panel OLS (Table 4, Column 1, Rows 1 and 5), from -0.023 to -0.028 under *IV1* (Table 4, Column 2, Rows 1 and 5), and from -0.032 to -0.039 under *IV2* (Table 4, Column 3, Rows 1 and 5). Weak PE indicators, such as corruption, increase the costs of doing business and discourage the usage of remittances for productive ventures (Borja, 2017). These are features frequently observed among poor families who are unable to protect their assets against corrupt practices such as bribery and cumbersome steps to open new businesses. Middle- and high-income groups are also exposed to corruption, but they tend to be better-connected with government officials and are more knowledgeable of the operations within the corrupt system, thus, reducing their exposure to the damages of corruption (Gupta et al. 2002).

The last row in Table 4 captures how often the magnitude of the remittances parameter significantly increases with the inclusion of an IQI-PE. For example, the PE indicators increase the effect of remittances on inequality in 11 out of the 12 cases when using panel OLS or *IV1*, and in each of the 12 cases when using panel *IV2*. In summary, controlling for the PE index results in remittances having a stronger income equalizing effect.

A similar trend is observed in Table 5. The Political Stability indicators (PS) significantly strengthen the marginal effect of remittances in reducing inequality in half of the indicators under Panel OLS, and under five indicators under *IV1* or *IV2* (last row of Table 5). For example, after controlling for the WGI – Absence of Violence, the marginal effect of remittances increases from

-0.025 to -0.029 under Panel OLS, from -0.023 to -0.027 under *IV1*, and from -0.032 to -0.040 under *IV2* (Tables 5, row 7). Studies have shown that crime, violence, and insecurity have a negative effect on remittances inflows, investment, and economic growth (Borja 2014; Goulas and Zervoyianni 2013); however, this effect is not evenly distributed among all groups. Poor populations are highly exposed to insecurity and violent crimes, more so than middle- and high-income groups, who are able to move their residences and businesses out of the violent areas. These groups are also protected by more public security than poor communities (Fajnzylber et al. 2002). Thus, low PS indicators will reduce the effective use of remittances, and this effect is stronger among low-income groups.

The remittance parameters are statistically significant in all Economic Policy (EP) indicators presented in Table 6. The results show that EP strengthen the equalizing effect of remittances in 40% of the cases (last row, Table 6). For instance, in countries with high level of inflation or cumbersome money exchange systems, poor families are exposed to the losses of value on their monetary assets –including remittances–, more so than middle- and high-income families (Ghossoub and Reed, 2017). Poor families tend to have limited venues to locate savings, and thus, high inflation can easily erode the value of their remittances. On the other hand, middle- and high-income families have alternative outlets available to them to protect their assets against inflation (gold, foreign accounts, etc.) This implies that the burden of inflation weights more on low-income families and their productive assets, increasing the inequality gap.

Table 5: Remittances, income inequality, and political stability (PS)

	Institutional Quality Indicator	Panel OLS (1)	2SLS-IV1 (2)	2SLS-IV2 (3)
	REM	-0.025**	-0.023**	-0.032***
1	REM / ICRG-Government Stability	-0.027**	-0.022**	-0.031***
2	REM / ICRG-Internal Conflict	-0.024**	-0.065***	-0.083***
3	REM / ICRG-External Conflict	-0.023**	-0.021*	-0.030**
4	REM / ICRG-Ethnic Tensions	-0.025**	-0.023**	-0.032***
5	REM / Polity IV	-0.025**	-0.023**	-0.028***
6	REM / WGI-Voice and Accountability	-0.026**	-0.024**	-0.082***
7	REM / WGI-Absence of Violence	-0.029**	-0.027**	-0.040***
8	REM / WGI-Government Effectiveness	-0.033***	-0.031***	-0.042***
	Significant Increase in the Magnitude of Remittances	4/8	5/8	5/8

Notes: *** denotes significance at the 1% level, ** at the 5% level, and * at the 10% level. The dependent variable is the Gini Coefficient. All independent variables are in logs. The t-statistics are suppressed for clarity but the asterisks correspond to the level of significance. The last row reflects the number of cases in which the IQI significantly increase the marginal effect of remittances when compared to values in row one.

Several important results emerge from Tables 4–6. First, after controlling for institutional quality indicators, remittances continue to reduce income inequality in each of the cases. Second, the IQIs show enhancing properties on the relationship between remittances and inequality; that is, remittances are more likely to have an income-equalizing effect among countries with higher institutional quality in place.

Table 6: Remittances, income inequality, and economic policy (EP)

	Institutional Quality Indicator	Panel OLS (1)	2SLS-IV1 (2)	2SLS-IV2 (3)
	REM	-0.025**	-0.023**	-0.032***
1	REM / WBDI-Government Consumption	-0.023**	-0.022**	-0.031***
2	REM / WDI-Money Growth (M2)	-0.026**	-0.024**	-0.033***
3	REM / FI-Black Market Exchange Rate	-0.027***	-0.025**	-0.034***
4	REM / FI-Tariff	-0.023**	-0.021**	-0.028***
5	REM / WBDI-Openness	-0.024**	-0.022**	-0.031***
	Significant Increase in the Magnitude of Remittances	2/5	2/5	2/5

Notes: *** denotes significance at the 1% level, ** at the 5% level, and * at the 10% level. The dependent variable is the Gini Coefficient. All independent variables are in logs. The t-statistics are suppressed for clarity but the asterisks correspond to the level of significance. The last row reflects the number of cases in which the IQI significantly increase the marginal effect of remittances when compared to values in row one.

After addressing potential endogeneity bias, the results show that the marginal impact of remittances on inequality increases in 17 out of the 25 regressions using Panel OLS, 18/25 using *IVI* and 19/25 using *IV2*. Moreover, the PE indicators emerge as the most important IQIs in leveraging the equalizing effect of remittances. That is, freedom from corruption, law and order, and property right indicators assist remittance inflows in narrowing the income gap in developing countries.

4.2 Heavy Recipient Countries

We complement our analysis by focusing on those countries heavily dependent on remittances. Specifically, we construct a subset of countries with remittances-to-GDP share of more than 1% (the sample size changes from 79 to 46 countries). Table 7 shows the results from Equation (1) using this subset of countries and reveals how remittances have a much stronger impact on inequality. The remittance parameter notably increases from -0.025 (Table 2) to -0.052 (Table 7) when using the panel OLS estimations. Using 2SLS, the remittances change from -0.023 to -0.053 (*IVI*) and from -0.032 to -0.065 (*IV2*).

Table 8 replicates Table 3 using the subset of countries with remittances-to-GDP share of more than 1%. The negative relationship between remittances and income inequality is not only stable, it is also robust. Once controlling for WGI – Rule of Law, the magnitude of remittances under *IVI* is strengthened from -0.053 (Table 7) to -0.055 (Table 8) using *IVI*. Overall, after controlling for the quality of institutions, remittances become a stronger tool for reducing income inequality among these subsets of countries. This is consistent with the findings in Koechlin and Leon (2007) in which remittances reduce inequality when the remittances-to-GDP ratio is greater than approximately 1.4 percent.

Remittances reduce income inequality in developing nations. Furthermore, remittances reduce income inequality by a greater magnitude in nations with an improved institutional framework. Our results, however, have some limitations. The possible endogeneity between each IQI and the

Gini coefficient is an ongoing concern. Developing several IVs that effectively substitute for each IQI is a notable challenge.

Table 7: Remittances and income inequality among high remittance countries

Variable	Panel OLS (1)	2SLS-IV1 (2)	2SLS-IV2 (3)
REM	-0.052*** (-3.54)	-0.053*** (-3.60)	-0.065*** (-4.25)
GDPpc	0.991*** (2.82)	0.990*** (2.82)	0.988*** (2.78)
GDPpc ²	-0.059*** (-2.49)	-0.059** (-2.49)	-0.059** (-2.46)
EDU	-0.116* (-2.48)	-0.115* (-1.76)	-0.101 (-1.19)
Constant	1.243 (1.02)	1.264 (1.04)	1.463 (1.19)
Wald stat- χ^2 (p-value)		31.92 (0.000)	36.67 (0.000)
Cragg-Donald stat-F (p-value)		1007.64 (0.000)	164.08 (0.000)
Hausman stat- χ^2 (p-value)		0.60 (0.963)	8.50 (0.075)
Observations	130	130	130
R-Squared	0.417	0.407	0.395

Notes: *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. The dependent variable is the Gini Coefficient. All variables are in logs and t-statistics are provided in the parentheses. The Hausman test compares the estimators from the OLS model and the 2SLS models where the null hypothesis is that the estimators from the 2SLS are efficient and consistent as those from the OLS estimators. The Wald test confirms the IVs are exogenous and the Cragg-Donald statistic tests the strength of the IVs.

Table 8: Remittances and income inequality among high remittance countries

Variable	Panel OLS (1)	2SLS IV1 (2)	2SLS IV2 (3)	Panel OLS (4)	2SLS IV1 (5)	2SLS IV2 (6)	Panel OLS (7)	2SLS IV1 (8)	2SLS IV2 (9)
REM	-0.054*** (-3.60)	-0.055*** (-3.64)	-0.067*** (-4.27)	-0.052*** (-2.97)	-0.054*** (-3.04)	-0.072*** (-3.84)	-0.055*** (-3.86)	-0.056*** (-3.89)	-0.067*** (-4.48)
GDPpc	0.662* (1.73)	0.661* (1.73)	0.643* (1.67)	0.799** (2.08)	0.795** (2.07)	0.747* (1.92)	0.891*** (2.65)	0.891*** (2.65)	0.874*** (2.57)
GDPpc ²	-0.037 (-1.44)	-0.037 (-1.44)	-0.036 (-1.38)	-0.047* (-1.82)	-0.047* (1.84)	-0.043* (-1.65)	-0.053** (-2.36)	-0.053** (-2.36)	-0.052** (-2.29)
EDU	-0.065 (-0.94)	-0.064 (-0.92)	-0.047 (-0.67)	-0.084 (-1.21)	-0.082 (-1.19)	-0.062 (-0.88)	-0.093 (-1.35)	-0.093 (-1.53)	-0.080 (-1.30)
WGI-Rule of Law	-0.072 (-1.38)	-0.072 (-1.39)	-0.075 (-1.43)						
WGI-Abs Violence				0.002 (0.06)	0.000 (0.01)	-0.019 (-0.48)			
FI-Black Market							0.029** (2.33)	0.029** (2.33)	0.028** (2.24)
Constant	2.288* (1.73)	2.307* (1.75)	2.554* (1.91)	1.899 (1.39)	1.938 (1.42)	2.374* (1.71)	1.390 (1.16)	1.390 (1.16)	1.651 (1.36)

Wald χ^2 (p)		27.76 (0.000)	32.49 (0.000)		24.86 (0.000)	29.87 (0.000)		39.90 (0.000)	44.81 (0.000)
Cragg-Donald (p)		849.56 (0.000)	134.87 (0.000)		845.83 (0.000)	121.40 (0.000)		895.43 (0.000)	122.53 (0.000)
Hausman χ^2 (p)		0.33 (0.997)	8.01 (0.156)		0.55 (0.990)	8.88 (0.114)		0.00 (0.999)	7.42 (0.191)
Obs.	112	110	112	112	112	112	119	119	119
R ²	0.439	0.561	0.425	0.368	0.368	0.362	0.513	0.511	0.437

Notes: *** denotes statistical significance at the 1% level, ** at the 5% level, and * at the 10% level. The dependent variable is the Gini Coefficient. All variables are in logs and t-statistics are provided in the parentheses. The Hausman test compares the estimators from the OLS model and the 2SLS models where the null hypothesis is that the estimators from the 2SLS are efficient and consistent as those from the OLS estimators. The Wald test confirms the IVs are exogenous and the Cragg-Donald statistic tests the strength of the IVs. The (p) means p value.

This study provides evidence of the complementarity between remittances and quality of institutions in reducing income inequality for a large group of developing nations. However, there are several dimensions on the relationship between remittances and inequality, remittances and institutions, and institutions and inequality that have been left for further examination. For instance, the non-linear relationship between remittances and inequality, and institutions and inequality observed in studies with micro-data is a promising area of research.

5 CONCLUSIONS

This study provides empirical evidence on the relationship between remittances and inequality when controlling for the quality of institutions. By compiling 25 variables on institutional attributes and data on remittances and income inequality for 79 developing nations, we found that these unilateral foreign inflows reduce the gap between rich and poor. This effect is reinforced further by the quality of the institutional context. When incorporating the 12 PE indicators into the analysis, we found that remittances reduce income inequality in nearly all cases (under *IV1* and *IV2* regressions). In the case of PS indexes, the remittance coefficient is significantly higher in the majority of cases (under *IV1* and *IV2* regressions), and when controlling for the EP indexes, the remittance coefficient is significantly higher in 40% of cases (under *IV1* and *IV2* regressions). These values are sustained among heavy-remittance recipient nations.

Our results indicate a robust negative relationship between remittances and inequality once the institutional infrastructure is accounted for. However, empirical results on the relationship between remittances and income inequality can be tainted by endogeneity bias stemming from the possible effects of inequality on remittances. In order to minimize this concern, we developed two instrumental variables and performed numerous regression analyses to corroborate the stability of the parameter values. First, we developed a panel OLS system, followed by a 2SLS regression analysis. By using IVs that are highly correlated with remittances but to some extent unrelated to the Gini coefficient, we addressed the endogeneity issues commonly observed in this type of empirical analysis.

Several policy implications can be drawn from our findings. Developing countries currently coping with high levels of corruption might lead to a deterioration of income for the poor, even more so than that among higher-income citizens. Facing poor quality of institutions, remittance recipients in the lowest-income cohorts may opt out using remittances toward long-term effective economic

activities, such as education, health, and developing or expanding new businesses. Thus, any possible income equalizing effects through the marginal productivity of remittances may be absent. Policymakers interested in enhancing the benefits of remittances among the poor can tackle institutional shortcomings by facilitating the procedures to open a new business, by promoting transparency regarding property rights documentation, and by reinforcing the law enforcement. In addition, remittances should be welcomed into recipient countries through minimal and clear banking and exchange rate systems.

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APPENDIX

Appendix 1. Institutional Quality Indicators (IQI): Variables and Sources

Variable	Description (Source and Number of Observations)
Gini Coefficient	The Gini Coefficient is the measure of income inequality from The World Bank. This measure ranges from 0 (lowest inequality) to 1 (highest inequality). Years: 1990 to 2010.
REM	Remittances. It is the sum of three items: workers' remittances, compensation of employees, and migrant transfers. (WBD). Years: 1990 to 2010.
Real GDP per capita	Real GDP per capita is from The World Bank
Education	Secondary enrolment rates provide by The World Bank
ICRG-Corruption	Range: Min=0 (high corruption); Max=6 (low corruption). (ICRG)
ICRG-Law and Order	Range: Min=0 (the law is ignored or without effective sanction); Max=6 (strong judicial system). (ICRG)
ICRG-Bureaucracy Quality	Range: Min=0 (a change in government tends to be difficult); Max=4 (the bureaucracy has the strength and expertise to govern without drastic changes in policy.) (ICRG)
ICRG-Quality Institutions	Range Min=0; Max =16. It is the sum of corruption, law and order, and bureaucracy quality as in Bekaert et al. (2006). (ICRG)
WGI-Regulatory Quality	Range: Min=-2.0 (weak perception of the ability of the government to formulate and implement sound policies); Max = 2.5 (a very positive perception of a government with the ability to formulate and implement sound policies). (WGI)
WGI-Rule of Law	Range: Min =-2.0 (weak perception of contract enforcement, property rights, police, and courts); Max = 2.5 (strong perception of citizens abiding by the rule of law). (WGI)
WGI-Corruption	Range: Min=-2.5 (a perception of power of interest groups, usage of public institutions for private gains, etc.); Max = 2.5 (a perception of almost no evidence of public power exercised for private gain, including, petty and grand forms of corruption). (WGI)
HF-Economic Freedom Index	Score: Min=0, Max=100. It scores nations on 10 factors of economic freedom using statistics from the World Bank, the IMF and the Economist Intelligence Unit. The 10 components are equally weighted and averaged. (HF)
HF-Property Rights	It assesses the ability of individuals to accumulate private property, secured by laws that are enforced by the state. (HF)
HF-Freedom from Corruption	Score: Min=0 (private property is outlawed, and all property belongs to the state. People do not have access to the courts); Max=100 (private property is guaranteed. The court system enforces contracts efficiently. The justice system punishes those who unlawfully confiscate private property. (HF)
FI-Legal/ Property Rights	Range: Min=0 (low perception of judicial independence, impartial court protection, and no integrity in the legal and judicial system), Max=10 (high-clear-neutral legal and judicial processes). (FI)
TI-Corruption Perceptions Index	Range: Min=0 (high corruption); Max=10 (low or no corruption). (TI)

ICRG-Government Stability	Range: Min =0 (government's inability to carry out its declared programs and its ability to stay in office); Max=12 (government's ability to carry out its declared programs and its ability to stay in office). (ICRG)
ICRG-Internal Conflict	Range: Min=0 (political violence in the country); Max= 12 (no political violence in the country). (ICRG)
ICRG-External Conflict	Range: Min=0 (high degree of diplomatic pressures, withholding of aid, trade restrictions, sanctions, cross-border conflicts, etc.); Max= 12 (nonexistence of diplomatic pressures, withholding of aid, trade restrictions, sanctions, cross-border conflicts, etc.) (ICRG)
ICRG-Ethnic Tensions	Range: Min=0 (high degree of racial, language or nationality tensions); Max = 6 (low degree of racial, language or nationality tensions). (ICRG)
Polity IV	Range: Min=-10 (autocratic government), Max=10 (democratic government). (INSCR)
WGI-Voice and Accountability	Range: Min=-2.5 (weak governance performance such as citizens ability to participate in public elections, freedom of expression and media); Max=2.5 (strong governance performance). (WGI)
WGI-Absence of Violence	Min=-2.5 (high likelihood that the government will be destabilized or overthrown by violent means); Max=2.5 (low likelihood that the government will be destabilized or overthrown by violent means). (WGI)
WGI-Government Effectiveness	Range: Min = -2.5 (low perception of the quality of public services and the degree of its independence from political pressure); Max=2.5 (high confidence in the quality of public services and the degree of its independence from political pressure). (WGI)
Government Consumption	General government final consumption expenditure (as a proportion of GDP) (WBDI)
Money Growth (M2)	Money and quasi money growth (annual percentage) (WBDI)
Openness	Trade openness: export plus imports as a share of GDP, in current US\$. (WBDI)
Black Market Exchange Rate	It is the difference between the official and the parallel (black) market exchange rate. (FI)
FI-Tariff	It is the average tariff rates. (FI)

Notes: WBDI: World Bank Development Indicator. Years: 1990-2010; ICRG: International Country Risk Guide (The Political Risk Service Group). Years: 1984-2009; WGI: Worldwide Governance Indicators. Years: 1996-2010; HF: The Heritage Foundation. Years: 1995-2009; FI: Fraser Institute Years: 1975-2009; TI-CPI: Transparency International, Corruption Perception Index. Years: 1995-2009; INSCR: Integrated Network for Societal Conflict Research, Polity IV. Years: 1990-2010.

Appendix 2: List of 79 Developing Countries

1. Albania	21. El Salvador	41. Malawi	61. Russia
2. Argentina	22. Estonia	42. Malaysia	62. Rwanda
3. Armenia	23. Fiji	43. Maldives	63. Senegal
4. Bangladesh	24. Ghana	44. Mali	64. Sierra Leone
5. Belize	25. Guatemala	45. Mauritania	65. Slovakia

6. Bolivia	26. Guyana	46. Mexico	66. Slovenia
7. Brazil	27. Honduras	47. Mongolia	67. South Africa
8. Bulgaria	28. Hungary	48. Morocco	68. Sri Lanka
9. Cambodia	29. India	49. Mozambique	69. Swaziland
10. Cameroon	30. Indonesia	50. Namibia	70. Tajikistan
11. Chile	31. Iran	51. Nepal	71. Thailand
12. China	32. Jamaica	52. Nicaragua	72. Tunisia
13. Colombia	33. Jordan	53. Niger	73. Uganda
14. Costa Rica	34. Kazakhstan	54. Pakistan	74. Ukraine
15. Cote d'Ivoire	35. Kenya	55. Panama	75. Uruguay
16. Croatia	36. Kyrgyzstan	56. Paraguay	76. Venezuela
17. Czech Republic	37. Laos	57. Peru	77. Vietnam
18. Dom. Republic	38. Latvia	58. Philippines	78. Yemen
19. Ecuador	39. Lesotho	59. Poland	79. Zambia
20. Egypt	40. Lithuania	60. Moldova	

