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International Remittances, Domestic Remittances, and Income Inequality in the Dominican Republic

by

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International Remittances, Domestic Remittances, and Income Inequality in the Dominican Republic*

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Abstract

Inequality decomposition techniques are used to analyze the different impacts of domestic and international remittances on household income inequality in the Dominican Republic. Domestic remittances seem more likely to be equalizing than international remittances. The negative marginal effect on inequality of domestic remittances is more prominent among rural households, and in particular among landless rural households, while the negative marginal effect on inequality of international remittances is more prominent among urban households, and in particular outside of the Santo Domingo area. Stronger marginal effects of remittances were found among female-headed households, the elderly and the less educated. Both domestic and international remittances are higher among female-headed households and the elderly. Education is associated with lower domestic remittances and higher international remittances, probably reflecting the role of education in promoting international versus domestic migration. An increase in schooling increases inequality through domestic remittances and decreases inequality through international remittances, while a reduction in household size reduces inequality through both domestic and international remittances. This analysis highlights the importance of the distinction between domestic and international remittances as drivers of inequality as well as the importance of identifying and quantifying the determinants of remittances and their subsequent impact on inequality.

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Introduction

Despite evidence for negative impact of out-migration on the economy due to brain drain (Adams, 2003), remittances from migrants have contributed significantly to income in sending communities. Adams and Page (2005) have shown that an increase in international remittances reduces poverty in developing countries. However, other studies have found both positive and negative effects of remittances on poverty and inequality in various countries (Taylor, 1999; Acosta et al., 2008). Theoretically, remittances are likely to increase inequality at initial stages of the migration process and increase inequality at later stages (Özden and Schiff, 2006; Rapoport and Docquier, 2006). This prediction is supported by the empirical findings of Stark, Taylor and Yitzhaki (1986, 1988) and Taylor et al. (2005). The latter also differentiated between domestic and international remittances, and showed that they had different effects on inequality and poverty in rural Mexico.

The purpose of this paper is to investigate the impact of domestic and international remittances on household income inequality in the Dominican Republic. Despite impressive growth performance since about 1970, poverty and inequality remain important issues in the Dominican Republic, with 42% of the population below the poverty line in 2004 (World Bank, 2006). The country has a rich history of rural-to-urban migration as well as international out-migration, especially to the U.S. (Pessar, 1982). International remittances have increased dramatically since the mid-1980s to more than 10% of GNP (figure 1), and are conceived as a potentially equalizing income source. However, the Gini index of inequality hardly changed over the years (figure 1). Fajnzylber and Lopez (2008) even found that the observed Gini index in the Dominican Republic is slightly higher that what it would have been without migration and remittances. They used a comparison of the actual and counterfactual income distributions, with the latter based on simulating household incomes in the absence of migration and remittances, and did not distinguish between domestic and international remittances. While total remittances as a fraction of household income was roughly constant across income quintiles in the Dominican Republic in 1998, the share of international remittances in total remittances was 60% in the highest quintile but only 20% in the lowest quintile (World Bank, 2000). Therefore, the distinction between domestic and international remittances is very important for the analysis of inequality.

This paper uses inequality decomposition techniques in order to obtain marginal effects of domestic and international remittances on inequality, a method that has been applied to other countries before (e.g., Stark, Taylor and Yitzhaki, 1986). Two decomposition rules are used. Shorrocks (1982) and Fields (2003) suggested that the squared coefficient of variation has superior theoretical properties. On the other hand, the decomposition of the Gini index of inequality is more intuitively appealing and offers an analytic formula for the marginal effects (Lerman and Yitzhaki, 1985). Previous research has shown that the results of the two decomposition rules are mostly but not always consistent (Shorrocks, 1983; Morduch and Sicular, 2002; Kimhi, 2007). This paper compares the results of the two rules, by obtaining marginal effects for the squared CV rule using a simulation exercise.

The next section describes the methodology of inequality decomposition by income sources. The following section presents the decomposition results and the marginal effects. After that we analyze the determinants of remittances and their inequality implications. Subsequently, we decompose the contributions of remittances to inequality further, by the determinants of remittances. The final section summarizes the results.

Methodology

Shorrocks (1982,1983) suggested focusing on inequality measures that can be written as a weighted sum of incomes:

$$(1) \qquad I(\mathbf{y}) = \Sigma_i a_i(\mathbf{y}) y_i,$$

where a_i are the weights, y_i is the income of household i, and $\mathbf{y}$ is the vector of household incomes. If income is observed as the sum of incomes from k different sources, $y_i=\Sigma_k y_i^k$, the inequality measure (1) can be written as the sum of source-specific components S^k:

$$(2) \qquad I(\mathbf{y}) = \Sigma_i a_i(\mathbf{y}) \Sigma_k y_i^k = \Sigma_k [\Sigma_i a_i(\mathbf{y}) y_i^k] \equiv \Sigma_k S^k.$$

Dividing (2) through by $I(\mathbf{y})$, one obtains the proportional contribution of income source k to overall inequality as:

(3) $s^k = \Sigma_i a_i(\mathbf{y}) y_i^k / I(\mathbf{y})$.

Shorrocks (1982) noted that the decomposition procedure (3) yields an infinite number of potential decomposition rules for each inequality index, because in principle, the weights $a_i(\mathbf{y})$ can be chosen in numerous ways, so that the proportional contribution assigned to any income source can be made to take any value between minus and plus infinity. He further showed how additional intuitive restrictions on the choice of weights can reduce the number of potential decomposition rules, and came up with a unique decomposition rule based on the squared coefficient of variation inequality index. Fields (2003) reached the same conclusion in a different way. However, Shorrocks (1983) still suggested not to rely solely on this decomposition rule in empirical analyses.

The decomposition results indicate how changes in the variability of income from each source are likely to affect total income inequality (Kimhi, 2007). Perhaps a more policy-relevant result is the impact on inequality of a uniform change in a particular income source. Shorrocks (1983) has noted that comparing s^k, the contribution of income source k to inequality, and μ^k/μ, the income share of source k, is useful for knowing whether the k^{th} income source is equalizing or disequalizing. Lerman and Yitzhaki (1985) have shown that the relative change in the Gini inequality index following a uniform percentage change in $\mathbf{y}^k$ is $(s^k - \mu^k/\mu)\mathrm{G}(\mathbf{y})$. Kimhi (2007) has shown that a similar result can be obtained for other inequality measures, including the squared coefficient of variation, using simulations.

Inequality impacts of domestic and international remittances

The data used in this research is obtained from the 1992 Family Expenditure Survey in the Dominican Republic. The survey included about 1,200 households. Besides detailed income and expenditure data, it included demographic and socio-economic data such as age, education, and labor supply of all household members, detailed information on agricultural activities, and indices of living conditions. The first column in table 1 shows the distribution of per-capita income across income sources. Labor income comprises the lion's share of per-capita income, with capital income (pensions, insurance and interest) in second place. Domestic remittances account for only one percent of per-capita income, while international remittances account for six percent.

The last two columns in table 1 show the inequality decomposition results (top) and marginal effects (bottom). The decomposition results show that the relative contributions of the income sources roughly correspond to their income shares. The two decomposition rules mostly agree on these relative contributions, with the exception of family business income, which accounts for 13% of inequality under the Gini decomposition rule and 30% under the squared CV rule. The contribution of domestic remittances to inequality is negative. This implies that an increase in the variance of domestic remittances is expected to reduce income inequality. Given that domestic remittances are much more important for poor households (World Bank, 2000), this result is expected. The contribution of international remittances, on the other hand, is positive.

The marginal effects show the percentage impact on inequality of a uniform one-percent increase in each income source. Here we find differences in statistical significance across the two decomposition rules. The income sources that have positive marginal effects on inequality are self-employment, family business, and pensions, insurance and interest income. However, these marginal effects are statistically significant only under the Gini decomposition rule. The negative marginal effects of wage labor and agricultural income are statistically significant under both decomposition rules, and the same is true for domestic remittances. International remittances also have a negative marginal effect, but this effect is statistically significant only under the square CV decomposition rule. Moreover, the marginal effect of domestic remittances is nine times larger than the marginal effect of international remittances (in absolute value) under the Gini decomposition rule, but it is 60% smaller under the squared CV decomposition rule.

The results are therefore quite vague with respect to the relative contributions to inequality of domestic and international remittances. However, it is pretty clear that uniform increases in remittances are likely to reduce income inequality. In fact, when the analysis was repeated with total remittances rather than differentiating between domestic and international remittances, the marginal effect of remittances on inequality was significantly negative under both decomposition rules. Combining the decomposition results and the marginal effects, we can say that an increase in domestic remittances is likely to reduce inequality unless the increase is concentrated among households with the lowest levels of domestic remittances (which are likely to be richer overall). An increase in international remittances, on the other hand, is likely

to reduce inequality *only* if it is concentrated among households with the lowest levels of international remittances (which are likely to be poor). The impact of changes in domestic and international migration on income inequality in the Dominican Republic should be evaluated differentially according to these results.

Differentiating by population sub-groups

To delve deeper into the issue of differential effects of domestic and international remittances, we recall that the relative importance of domestic and international remittances is not homogeneous across population sub-groups. In particular, domestic remittances are more important as a source of income for poor households, while international remittances are more important for richer households (World Bank, 2000). Poverty and inequality are also not homogeneous across population sub-groups. In particular, they have a strong geographic dimension (World Bank, 2006). Table 2 shows the relative importance of income sources to household income of different population sub-groups. Comparing urban and rural households, we find that relatively more rural households enjoy domestic remittances, while many more urban households enjoy international remittances. This is explained by the inability of poor rural households to afford sending a migrant out of the country, and by the fact that many urban households are already residing not far from a well-developed labor market, hence domestic migration is not relevant for them. This last argument is supported by the fact that among urban households, fewer households enjoy domestic remittances in the Santo Domingo area (the major urban center in the country) than elsewhere. We also find that among rural households, households with land (which are supposedly more affluent) are more likely to enjoy domestic remittances than landless households, and the fraction of their international remittances out of total income is twice as high as the same fraction for landless households.

Another population sub-group that seems to be unique with respect to the composition of income is female-headed households. These households are much more likely to obtain domestic and international remittances, and the fraction of remittances in total household income is also much higher. It could be that the mere fact that many of these households are headed by a female is a result of the migration of the male spouse either domestically or internationally. Differentiating by households according to the age of the head of household, we find that older

households are more likely to obtain remittances, and the difference is particularly notable with respect to domestic remittances. Similar differences are observed with respect to the share of remittances out of total household income. Finally, differentiating by households according to the schooling of the head of household, we find that more educated households are less likely to obtain domestic remittances and more likely to obtain international remittances. Despite that, the share of international remittances out of total household income is lower in more educated households.

It would thus be interesting to look at the differential marginal effects of income from domestic and international remittances on inequality for each population sub-group. Table 3 shows simulated marginal effects of uniform increases in remittances broken down by those same population sub-groups that were presented in table 2. Comparing rural and urban households, we observe that using the Gini inequality index, the negative marginal effect of domestic remittances is much larger for rural than for urban households. However, the marginal effect on the squared CV inequality index is split almost evenly between these sub-groups. On the other hand, the marginal effect of international remittances is much larger (in absolute value) among urban households, using the squared CV inequality index. The marginal effects under the Gini index are not statistically significant. This is consistent with our earlier result that domestic remittances are more important for rural households, while international remittances are more important for urban households.

The marginal effects of remittances among rural households are further broken down to households with land and landless households. It is easy to see that the negative marginal effects of both domestic and international remittances are larger in absolute value among landless households, for both inequality measures. The marginal effects of remittances among urban households are further broken down to households in the Santo Domingo area and in other areas. We find that marginal effects of remittances in the Santo Domingo area are weaker than in other urban areas, and the marginal effect of international remittances on the Gini inequality index even becomes positive for these households.

Looking at female-headed and male-headed households, we find that the negative marginal effects of remittances on inequality are stronger for female-headed households. Although the differences in table 3 do not seem to be impressive, note that female-headed households are less than a quarter of all households (table 2), and hence their relative marginal effects are indeed stronger. Differentiating by the age of

head of household, we find that the negative marginal effect of domestic remittances is stronger for older households, while the marginal effects of international remittances do not seem to vary by the age of head of household. Differentiating by the schooling of head of household, we find that the marginal effects of domestic remittances are consistently and significantly negative only for lower-educated households. This difference is also observed with respect to international remittances, but in this case it is not very consistent across the two inequality measures.

The results of this simulation exercise imply that while the equalizing nature of uniform increases in remittances is valid for almost all population sub-groups, it is stronger for population sub-groups that are comprised of relatively low-income households, such as rural landless households, urban households outside of the Santo-Domingo area, female-headed households, and the less educated. This implies that understanding the determinants of both rural-to-urban and international migration of low-income households is critical to the design of inequality-reducing policy measures. For example, education is known to be an important determinant of migration (Adams, 2003), although its effect varies considerably across countries (Acosta et al., 2008). If education stimulates migration, as seems to be the case for the Dominican Republic, then enhancing education among poorer households could have an equalizing effect on income through its effect on remittances. In the next section, we attempt to identify the determinants of remittances and their inequality implications.

The determinants of remittances and their inequality implications

A regression analysis is used to identify and quantify the effects of the determinants of remittances. Per-capita domestic and international remittances are analyzed separately, and a Tobit model is used since both types of remittances are censored from below at zero. The results are in table 4. The models were estimated with and without a log-transformation of the dependent variables. The results were not too different, therefore only the log-transformation results are presented. The results show that both domestic and international remittances are higher in female-headed households and in households in which the head of household is older. Schooling, on the other hand, affects domestic remittances negatively and international remittances positively. This implies selectivity on schooling in the migration decision, with the less educated migrating internally and the more educated

migrating internationally. This conclusion, of course, depends on the presumption that schooling of the household head is a good proxy for the schooling of migrant household members. Family size and landholdings do not have statistically significant effects on per-capita remittances. The geographic differences in migration patterns are also visible here, with domestic remittances lower in the Santo Domingo area, and international remittances lower in rural areas and higher in the Santiago area (the secondary urban center in the Dominican Republic).

The estimated regression coefficients can now be used in order to further decompose the part of income inequality that operates through remittances. Morduch and Sicular (2002) and Fields (2003) suggested a regression-based inequality decomposition by income determinants. In particular, total household income is specified as a linear regression:

(4) $\mathbf{y}=\mathbf{X\beta}+\boldsymbol{\varepsilon}$,

where $\mathbf{X}$ is a matrix of explanatory variables, $\boldsymbol{\beta}$ is a vector of coefficients, and $\boldsymbol{\varepsilon}$ is a vector of residuals. Given a vector of consistently estimated coefficients $\mathbf{b}$, income can be expressed as a sum of predicted income and a prediction error according to:

(5) $\mathbf{y} = \mathbf{Xb}+\mathbf{e}$.

Substituting (5) into (1) and dividing through by $I(\mathbf{y})$, the share of inequality attributed to explanatory variable m is obtained as:

(6) $s^m = b_m \Sigma_i a_i(\mathbf{y}) x_i^m / I(\mathbf{y})$.

Arayama et al. (2006) develop this decomposition method further in order to differentiate between contributions of explanatory variables through different income sources. In particular, they specify the k^{th} source-specific income-generating function as:

(7) $\mathbf{y}_k = \mathbf{X\beta}_k+\boldsymbol{\varepsilon}_k$,

where $\boldsymbol{\beta}_k$ could include zero elements corresponding to explanatory variables that do not affect the k'th source of income. Since $\mathbf{y} = \Sigma_k \mathbf{y}_k = \mathbf{X}\Sigma_k \boldsymbol{\beta}_k + \Sigma_k \boldsymbol{\varepsilon}_k$, using consistent estimates $\mathbf{b}_k$ of $\boldsymbol{\beta}_k$ and substituting into (1), the share of inequality attributed to explanatory variable m in overall inequality becomes:

$$(6)' \qquad s^m = (\Sigma_k b_{km})\Sigma_i a_i(\mathbf{y}) x_i^m / I(\mathbf{y}).$$

This can be broken down to source-specific contributions of each explanatory variable to overall inequality, denoted s^{mk}, which is implicitly defined by:

$$(8) \qquad s^m = \Sigma_k [b_{km}\Sigma_i a_i(\mathbf{y}) x_i^m / I(\mathbf{y})] = \Sigma_k s^{mk}.$$

The tobit coefficients in table 4 are used for $\mathbf{b}_k$ in (8). The results are in table 5. Recall that the contributions of domestic and international remittances to total income inequality were negative and positive, respectively (table 1). Table 5 shows that these contributions are mostly driven by the distributions of schooling and geographical location. The distribution of family size, on the other hand, contributes positively to inequality through both domestic and international remittances, while the distribution of landholdings (in particular, households with and without land) contributes negatively to inequality through both domestic and international remittances.

Another way to look at the impact of explanatory variables on inequality is through marginal effects. We use simulations to compute marginal effects in the following way. First, we make a change in an explanatory variable. Then, we use the regression coefficients in order to predict the resulting change in income from remittances. Finally, we compute the level of inequality of total income after incorporating this change. The changes in the explanatory variables used in this case are the following. Family size is increased by one person for the whole sample, landholdings per capita are increased by 1%, and each of the categorical variables is changed to 1 for the whole sample. Note that the results are not comparable to those reported in table 3. There, remittance income was increased by 1% for all rural households (for example), while here, remittance income of urban households is changed as if they were rural. Also, in the case of the categorical variables, the simulation obviously reduces the variance of the variable to zero, and hence the results are not independent of the inequality contributions reported in table 5.

However, note that the variance can be reduced to zero by either changing the categorical variable to one or to zero, and the marginal effects are going to be of opposite signs in those two cases.

The results are in table 6. Marginal effects of female-headed households, age above 50, and land ownership are negative for both domestic and international remittances. On the other hand, marginal effects of family size and landholdings are positive for both domestic and international remittances. The marginal effect of higher education is positive in the case of domestic remittances and negative in the case of international remittances, and the same is true for the marginal effects of the urban centers (Santo Domingo and Santiago). The marginal effect of rural households is negative in the case of domestic remittances and positive in the case of international remittances.

These results have a number of policy implications. Increasing the variance of schooling (by increasing schooling of households who are already more educated than the average) is expected to decrease domestic remittances and increase international remittances, probably through substitution of international migration for domestic migration. This is expected to increase income of these households, but since the impacts of schooling through domestic and international remittances are opposite in signs, the overall impact on income inequality is ambiguous. It depends on the initial position of these households within the income distribution. Similarly, migration of entire households from remote rural areas to central urban areas is expected to reduce domestic remittances and increase international remittances for these households, and the resulting effect on income inequality is ambiguous. A family planning policy that reduces fertility and therefore household size especially among the larger households is expected to reduce household size inequality, and according to table 5 this would reduce inequality through its impact on remittances. This policy would also reduce average household size and this would also reduce inequality through its effect on remittances (table 6). Hence, the impact of this policy on inequality (through remittances) is unambiguously negative. Finally, consider a land reform that allocates farmland to some landless households. This increases the variance of landlessness to the extent that less than half of the households own land, and hence reduces inequality according to table 5. This policy also reduces inequality according to table 6 because it increases the fraction of households with land. The bottom line seems to be

unambiguous, but note that this policy would also change the distribution of landholdings per capita, and this could change the picture.

Summary and conclusions

This paper used inequality decomposition techniques to analyze the differential roles of domestic and international remittances in determining household income inequality in the Dominican Republic. Decomposing total income inequality by income sources reveals that the variability of international remittances contributes positively to inequality, while the contribution of the variability of domestic remittances is negative. However, the marginal effect on inequality of a uniform increase in remittances is negative for both domestic and international remittances. Combining the results of the decomposition and the marginal effects, one can conclude that domestic remittances are more likely to be equalizing than international remittances. Breaking down the marginal effects by population sub-groups, we found that the negative marginal effect on inequality of domestic remittances is more prominent among rural households, and in particular among landless rural households, while the negative marginal effect on inequality of international remittances is more prominent among urban households, and in particular outside of the Santo Domingo area. Stronger marginal effects of remittances were also found among female-headed households, the elderly and the less educated. The conclusion is that the impact of remittances on inequality is far from being uniform across the population.

Analyzing the determinants of remittances, we found that both domestic and international remittances are higher among female-headed households and the elderly. Education seems to be associated with lower domestic remittances and higher international remittances, probably reflecting the role of education in promoting international versus domestic migration. Geographic differences in the levels of remittances are also observed. Breaking down the contributions of remittances to inequality into shares attributed to these inequality determinants, we found that an increase in schooling increases inequality through domestic remittances and decreases inequality through international remittances, while a reduction in household size is likely to reduce inequality through both domestic and international remittances. These results could be useful for policy evaluations.

The analysis of this paper highlights the importance of the distinction between domestic and international remittances as drivers of inequality in the case of the

Dominican Republic. It also emphasized the importance of identifying and quantifying the determinants of remittances and their subsequent impact on inequality. Still, the analysis is partial in the sense that it does not explicitly model the incidence of remittances. Recall that a Tobit model was used to estimate the determinants of remittances, but the coefficients were used in the decomposition procedure as if remittances are not censored. A more complete analysis should evaluate the marginal effects of determinants of remittances on the incidence if remittances as well as their level. In addition, the analysis focused on remittances and somewhat neglected the changes in other income sources as remittances change. This topic is left for future research.

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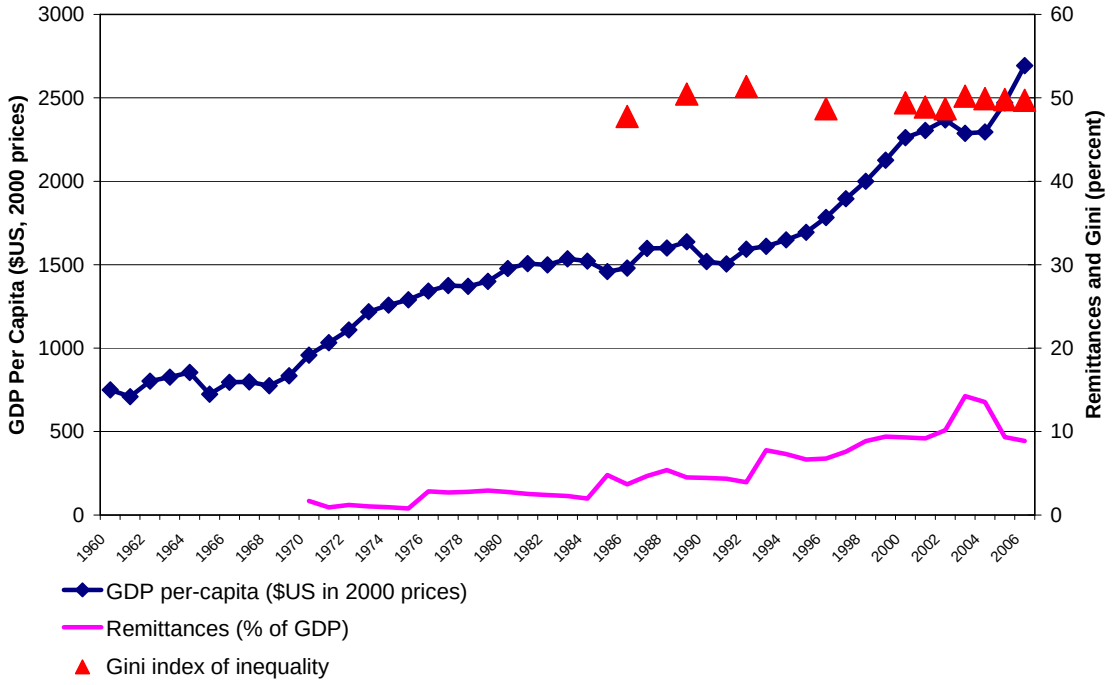

Figure 1: Growth, Remittances and Inequality in the Dominican Republic

Sources:
World Development Indicators 2006 (http://go.worldbank.org/RVW6YTLQH0).
Missing inequality data was obtained from the Socio-Economic Database for Latin America and the Caribbean (CEDLAS and The World Bank, www.depeco.econo.unlp.edu.ar/cedlas/)

Table 1. Inequality decomposition by income source

	Share of source-specific per-capita income	Inequality measures	
		Gini	Squared CV
Inequality index		0.5149	2.4219
Inequality contributions			
Wage labor income	32%	0.2460 (8.35)	0.1704 (2.94)
Self-employment income	30%	0.3628 (9.23)	0.3642 (3.27)
Agricultural income	7%	0.0522 (3.60)	0.0308 (1.77)
Family business income	7%	0.1302 (3.29)	0.3013 (2.00)
Pensions, insurance and interest income	4%	0.0678 (4.34)	0.0514 (2.44)
Domestic remittances	1%	-0.0029 (-2.49)	-0.0015 (-2.77)
International remittances	6%	0.0563 (5.35)	0.0232 (2.43)
Total	*100%*	*1.00*	*1.00*
Marginal effects			
Wage labor income		-0.0445% (-3.12)	-0.2545% (-1.96)
Self-employment income		0.0680% (3.68)	0.1200% (0.67)
Agricultural income		-0.0113% (-1.62)	-0.0684% (-2.07)
Family business income		0.0443% (2.37)	0.4744% (1.39)
Pensions, insurance and interest income		0.0201% (2.77)	0.0028% (0.11)
Domestic remittances		-0.0155% (-7.80)	-0.0280% (-4.70)
International remittances		-0.0017% (-0.37)	-0.0714% (-2.81)

Note: bootstrapped t-statistics in parentheses.

Table 2. The distribution of income sources by population sub-groups

	urban			rural		
	total	Santo Domingo area	other	total	landed	landless
Percentage of households	53	25	28	47	23	24
Percentage of households with income from:						
Wage labor	67	73	60	56	51	61
Self-employment	51	57	48	38	29	45
Agriculture	12	2	25	55	91	24
Family business	13	13	14	20	20	20
Pensions, insurance and interest	39	43	34	22	16	27
Domestic remittances	17	11	26	26	29	22
International remittances	39	40	36	21	21	21
Percentage of household income from:						
Wage labor	40	39	41	30	21	39
Self-employment	37	38	37	27	17	37
Agriculture	2	1	1	23	44	2
Family business	8	10	9	9	7	12
Pensions, insurance and interest	5	5	6	2	1	2
Domestic remittances	1	0	1	2	2	2
International remittances	7	6	6	6	8	4
Total	100	100	100	100	100	100

Continued on next page

Table 2. (continued)

	Gender*		Age*		Schooling*	
	Male	Female	Up to 50	51 plus	Up to 8	9 plus
Percentage of households	78	22	61	39	78	22
Percentage of households with income from:						
Wage labor	64	55	67	55	59	73
Self-employment	47	40	49	39	43	53
Agriculture	36	15	28	37	36	14
Family business	17	14	17	15	17	14
Pensions, insurance and interest	31	32	28	36	27	46
Domestic remittances	18	33	14	31	25	8
International remittances	25	48	28	34	29	37
Percentage of household income from:						
Wage labor	36	44	32	32	29	37
Self-employment	36	23	32	25	25	36
Agriculture	9	2	6	8	10	1
Family business	9	6	10	3	7	7
Pensions, insurance and interest	4	5	2	6	3	5
Domestic remittances	1	4	1	2	2	0
International remittances	5	16	5	7	6	4
Total	100	100	100	100	100	100

* Gender, age and schooling relate to the head of household.

Table 3. Breaking down the marginal effects of remittances on inequality

	Domestic remittances		International remittances	
	Gini	Squared CV	Gini	Squared CV
Total marginal effect	-0.0155% (-7.80)	-0.0280% (-4.70)	-0.0017% (-0.37)	-0.0714% (-2.81)
Rural	-0.0099% (-6.83)	-0.0146% (-4.53)	-0.0020% (-0.75)	-0.0197% (-2.82)
With land	-0.0039% (-4.57)	-0.0053% (-4.06)	0.0004% (0.16)	-0.0076% (-1.75)
Landless	-0.0060% (-2.49)	-0.0094% (-3.77)	-0.0024% (-2.44)	-0.0121% (-3.11)
Urban	-0.0057% (-4.79)	-0.0126% (-3.65)	0.0009% (0.21)	-0.0450% (-1.99)
Santo Domingo area	-0.0015% (-2.07)	-0.0034% (-2.13)	0.0062% (1.66)	-0.0165% (-1.01)
Other areas	-0.0043% (-4.48)	-0.0092% (-3.60)	-0.0053% (-3.55)	-0.0286% (-3.62)
Female-headed	-0.0082% (-5.05)	-0.0152% (-3.84)	-0.0024% (-0.68)	-0.0357% (-2.37)
Male-headed	-0.0075% (-6.25)	-0.0121% (-4.31)	0.0014% (0.38)	-0.0291% (-1.93)
Age up to 50	-0.0050% (-4.36)	-0.0079% (-3.44)	0.0008% (0.22)	-0.00315% (-1.86)
Age 51 and up	-0.0101% (-6.95)	-0.0184% (-3.82)	-0.0002% (-0.05)	-0.0332% (-2.17)
Schooling up to 8 years	-0.0151% (-8.02)	-0.0252% (-4.14)	-0.0039% (-0.88)	-0.0543% (-2.58)
Schooling 9 years and up	-0.0000% (-0.22)	-0.0011% (-1.82)	0.0044% (1.68)	-0.0104% (-0.91)

Notes:

Bootstrapped t-statistics in parentheses.

Age and schooling are of the head of household.

Table 4. Tobit results

Explanatory variable	Sample mean	*ln*(remittances per capita)	
		Domestic	International
Intercept	1.00	-6.81 (-4.75)**	-6.98 (-5.28)**
Female-headed household	0.22	4.07 (5.00)**	4.29 (6.06)**
Age above 50	0.39	3.66 (4.95)**	1.62 (2.50)*
Schooling 1 to 8 years	0.59	-0.42 (-0.49)	2.19 (2.53)**
Schooling above 8 years	0.22	-3.65 (-2.87)**	3.30 (3.11)**
Family size	5.15	-0.14 (-0.99)	0.04 (0.28)
Household with land	0.31	1.54 (1.48)	1.54 (1.53)
ln(landholdings per capita)	0.51	-0.28 (-0.72)	0.01 (0.02)
Rural	0.47	0.62 (0.80)	-3.16 (-4.41)**
Santo Domingo area	0.30	-3.11 (-3.37)**	0.83 (1.11)
Santiago area	0.09	-1.30 (-1.01)	3.26 (3.09)**
Sigma		8.03	7.89
Pseudo R^2		0.0515	0.0333
Likelihood ratio		126.83**	105.56**
Number of observations		1089	1089
% censored		79%	69%

* significant at 5%; ** significant at 1%.

Table 5. Source-specific contributions to total income inequality of determinants of remittances

Explanatory variable	Domestic remittances		International remittances	
	Gini	CV^2	Gini	CV^2
Intercept	0.00000 (0.13)	0.00000 (0.06)	0.00000 (0.13)	0.00000 (0.10)
Female-headed household	-0.00098 (-0.96)	-0.00082 (-1.66)	-0.00316 (-0.95)	-0.00272 (-1.62)
Age above 50	-0.00087 (-0.94)	-0.00027 (-0.54)	-0.00099 (-0.66)	-0.00030 (-0.34)
Schooling 1 to 8 years	0.00014 (1.97)	0.00013 (2.30)	-0.00524 (-2.11)	-0.00495 (-2.55)
Schooling above 8 years	-0.00753 (-8.23)	-0.00373 (-3.37)	0.02665 (9.55)	0.01357 (3.75)
Family size	0.00361 (8.68)	0.00120 (4.64)	0.00771 (8.64)	0.00260 (4.86)
Household with land	-0.00095 (-5.92)	-0.00027 (-2.60)	-0.01249 (-5.37)	-0.00360 (-2.72)
ln(landholdings per capita)	0.00011 (1.25)	0.00002 (0.32)	0.00069 (1.07)	0.00010 (0.29)
Rural	-0.00140 (-9.53)	-0.00052 (-4.62)	0.02738 (9.57)	0.01033 (4.83)
Santo Domingo area	-0.00717 (-8.29)	-0.00341 (-4.38)	0.01262 (8.72)	0.00609 (4.64)
Santiago area	-0.00035 (-1.77)	0.00001 (0.15)	0.00235 (1.63)	0.00010 (0.17)
Residual	0.01214 (6.40)	0.00633 (3.87)	0.11160 (15.8)	0.00418 (0.76)
Total (from table 1)	-0.00298 (-2.44)	-0.00140 (-2.27)	0.05630 (5.35)	0.02323 (2.43)

Notes:

Bootstrapped t-statistics in parentheses.

Table 6. Marginal effects of determinants of remittances on total income inequality

	Domestic remittances		International remittances	
Explanatory variable	Gini	CV^2	Gini	CV^2
Female-headed household	-5.072%	-9.917%	-14.922%	-28.889%
Age above 50	-3.251%	-6.513%	-4.859%	-9.790%
Schooling 1 to 8 years	-0.323%	-1.453%	-2.963%	-4.177%
Schooling above 8 years	5.027%	9.216%	-7.709%	-13.135%
Family size	0.407%	0.802%	0.869%	1.712%
Household with land	-0.596%	-1.303%	-6.823%	-14.998%
ln(landholdings per capita)	0.002%	0.005%	0.016%	0.031%
Rural	-0.274%	-0.717%	6.700%	16.121%
Santo Domingo area	3.973%	6.990%	-5.359%	-9.043%
Santiago area	1.305%	1.659%	-11.097%	-19.513%

Notes:

All marginal effects are highly significant; t-values were suppressed.

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