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Impact of remittances on poverty: an analysis of data from a set of developing countries

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Abstract

Remittances from international migrants constitute the largest source of financial inflows to developing countries. Poverty is a sensitive issue in developing countries, making the relationship between remittances and poverty important. In this paper, we analyze data from 25 developing countries for three years to determine the effects of total remittances received and net remittances received on poverty. We find that both are effective in reducing poverty. We find that GDP per capita and poverty have a negative relationship and higher income inequality implies more poverty. This paper supports the view that inward remittances reduce poverty in developing countries.

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1. INTRODUCTION

Remittances from international immigrants constitute the largest source of financial inflows into developing countries. Remittances to developing countries totalled $404 billion in 2013 with the overall figure reaching $542 billion. These figures have witnessed a continuous increasing trend over the past few decades. Remittances are mostly directed towards developing countries though not so much towards the poorest countries. India has consistently topped the list of remittance receiving countries for the past few years, followed closely by China, Philippines, France and Mexico. The USA has been the leading source of remittances since 1983, followed closely by Russia, Saudi Arabia and Switzerland (World Bank, 2014).

International financial flows in popular culture generally draw attention to official flows that go through firms, governments and international organizations like foreign direct and portfolio investments, official loans and grants. Remittances have come to the limelight in the past few decades and have taken centre stage in international financial flows as they have overtaken official aid flows to most developing countries. This has been true for South Asia and Latin America but not so much for Sub-Saharan Africa, where aid flows still overwhelm remittance flows (Gupta, Pattillo and Wagh (2009)). Remittances to developing countries are of first and foremost importance due to economic reasons as they represent financial flows to countries that are in need of assistance and these flows can aid in their growth and development process. The reason remittances gained importance in developing countries is that they are viewed as more stable than any other type of foreign currency flows (Gupta, Pattillo and Wagh (2009)). Therefore, the impact of remittances on indicators of inclusive growth like poverty and inequality gains importance. Similarly, poverty is a very sensitive issue in developing countries as they have larger vulnerable populations. It is sometimes perceived as a moral issue and involves factors that are beyond the scope of economics and governance. Therefore, poverty becomes an extremely important problem for developing countries that needs to be dealt with.

Remittances can be defined as all transfers from a foreign worker to his/her home country. These transfers are generally made from workers abroad to their friends and family in their home countries. These can be made through a variety of formal and informal channels. The high costs involved encourage the use of informal channels for transferring money and this often results in under reporting of the amount of remittances. Gupta, Pattillo and Wagh (2009) recognize the need to channel remittance flows through formal providers as a way of increasing their effectiveness. Adams and Page (2005) also recognize the need to reduce the costs of remitting money across borders.

One phenomenon that fuels the growth in remittances is the increasing trend of migration from developing countries to other countries for work and study. Migration fuels remittances for obvious reasons. A lot of remittances go to the better off developing countries in general as opposed to the poorest among them. A possible explanation for this trend may be that developed countries demand labour that is trained up to a certain level which the very poor countries are unable to provide in abundance. Migration from the developing world to other countries has also seen an increasing trend over the past few decades. The first explanation may be the burgeoning populations in the developing world that fuel competition which may compel the better qualified to look to opportunities outside their home countries. A second reason may be a general lack of opportunities. A third reason may be that better wages and standards of living in richer countries may motivate and attract labour to migrate from their home countries (Hariss-Todaro hypotheses).

The problem of under reporting can also prevail in the estimates of migration as migration also takes place through a lot of illegal channels. Authorities may fail to report a lot of illegal immigrants working in their countries. These immigrants then using the informal channels of transferring remittances to their home countries add to the distortion in the available estimates (Adams and Page (2005).

When remittances flow into a household or a country, they can be used in a number of ways. The money can be invested or used for consumption, which has a multiplier effect. The effect on the economy depends on the careful allocation of this money. Hoarding the money as an insurance against economic shocks will not make much difference to the economy. Therefore, we see that decision making in households on the use of remittances plays a crucial role in determining their impact. When remittances are allocated productively, they are likely to play an important part in the development process. It is here that institutions play a key role in defining the effects of remittances on growth (Catrinescu, Leon-Ledesma, Piracha and Quillin (2009)). Remittances have been found to have a positive impact on financial development in Sub-Saharan Africa (Gupta, Pattillo and Wagh (2009)). In any case, remittances can uplift impoverished households by increasing consumption and thereby reducing inequality. Hence, intuitively there is reason to believe that remittances will have a negative impact on poverty and inequality. Adams and Page (2005) study a set of 71 developing countries and find strong evidence to support the claim that migration and remittances do significantly reduce poverty and inequality in developing countries. Acosta, Calderon, Fajnzylber and Lopez (2008) study the relationship between remittances and poverty and inequality in 59 Latin American and Caribbean countries during 1970-2000. They use a sample of 221 observations for growth and 85 observations for inequality. They find that remittances boost growth and reduce poverty and inequality. They also conduct household level analysis which shows that remittances have poverty and inequality reducing effects even though the effects are quite small. Gupta, Pattillo and Wagh (2009) study the effects of the growing flow of remittances to Sub-Saharan Africa on poverty in addition to its effects on financial development. They find that remittances have a negative impact on both headcount poverty and the poverty gap ratio. Another factor which is sometimes overlooked during the study of the relationship between remittances and economic growth is the quality of institutions and the quality of political and economic policies. Catrinescu, Leon-Ledesma, Piracha and Quillin (2009) construct a dataset for 163 countries spanning the period 1970 to 2003. Their estimates show a positive relationship between remittances and growth. Their empirical analysis asserts the fact that institutions play a key role in determining the effect of remittances on growth. They say that good institutions help in ensuring that the remittances are channelled in an effective way so as to push the growth process along. Hence, governments of recipient countries must work towards improving the quality of their institutions (Catrinescu, Leon-Ledesma, Piracha and Quillin (2009)).

But the evidence on the issue is ambiguous. A possible explanation for this may be the following. It may be so that only the better off households are in a position to finance the migration of a member to another country. The poorest of households may not be equipped for that process, which results in the better off households receiving remittances. Giuliano and Ruiz-Arranz (2009) examine the role of the financial sector development of the remittance-receiving countries in using remittance flows. They use annual data for 73 developing countries from 1975 to 2002. They find that the impact of remittances on growth is almost zero. They also find that the effect of remittances on growth decreases as the level of financial development increases. They assert that remittances have actually replaced other financial services in the growth process in countries with less

developed financial systems, whereas as the countries become more financially developed, remittances lose importance (Giuliano and Ruiz-Arranz (2009)).

In this paper, we have estimated the effect of remittances received and net remittances on poverty in a set of 25 developing countries. Our data set spans the following three years: 2000, 2005 and 2010. The rest of the paper is divided into the following sections: section 2 deals with the methodology, which is divided into data and model framework sub-sections, section 3 discusses the results and section 4 is the conclusion.

2. METHODOLOGY

2.1 DATA

In this study, we make use of data for 25 developing countries for the years 2000, 2005 and 2010.The countries are listed separately in appendix 'A'. The World Bank list of developing countries was referred to but data for these three particular years was available for 25 out of 145 countries. All the variables that were used in our model were sourced from the World Bank's World Development Indicators 2013. The description of variables is given in appendix 'B'. The descriptive statistics of the variables are presented in appendices 'C' and 'D'.

2.2 FRAMEWORK

We estimate two models in this paper. The first one estimates the effect of remittances received and the second one estimates the effect of net remittances on poverty. We perform instrumental variable regressions to control for endogeneity.

First, we estimate the effect of remittances received on poverty. The first equation (1a) is the final regression and the second (1b) and third (1c) equations are the first stage regressions.

The following equations are estimated in model 1:

$$povt = a + b_1(remit) + b_2(gdpcap) + b_3(gini) + e.....(1a)$$

$$gdpcap = c + d_1(instr) + d_2(health) + d_3(educ) + z_1.....(1b)$$

$$gini = g + h_1(instr) + h_2(health) + h_3(educ) + z_2.....(1c)$$

where, 'povt' is poverty headcount ratio at $1.25 a day (PPP). The 'remit' includes total remittances received as a percentage of GDP[1]. The 'gdpcap' is gross domestic product divided by

[1]"Personal remittances comprise personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from non-resident households. Personal transfers thus include all current transfers between

midyear population. It is in constant U.S. dollars. 'gini' is the Gini index. 'instr' is the infrastructure variable which is represented by telephone lines and mobile cellular connections per 100 people. 'educ' is the levels of education which is represented by the net secondary school enrollment. It is the ratio of children of the official secondary school age who are enrolled in secondary school to the population of the official secondary school age. 'health' measures the health conditions in the economy and is represented by life expectancy at birth (LEB), measured in years. 'e', 'z_1' and 'z_2'are the error terms.

Remittances received as a percentage of GDP is the main variable in this model and the coefficient we are interested in is *'bi'*. Ideally, it should be negative indicating a negative relationship between poverty levels and remittances but the empirical evidence is mixed on the issue. We expect GDP per capita to be negatively related to poverty. A positive relationship between the Gini Index and poverty headcount is expected. Telephone and cellular connections are used as a proxy for infrastructure. Better infrastructure often augments the impacts of other factors on poverty. The secondary school enrollment ratio measures the levels of education in the economy and we know that education should positively affect GDP and therefore, poverty. Life expectancy at birth is a measure of health conditions and is included to gauge how better health can influence poverty in the presence of remittances.

Poverty has a direct relationship with GDP per capita. GDP in turn is influenced by the status of infrastructure, health and education. Good infrastructure, widespread healthcare and education are essential for growth and development. Since these have an indirect effect on poverty through GDP, we suspect GDP per capita to be endogenous and therefore, we perform 2sls regressions. In this model, we instrument GDP per capita and the instruments are infrastructure, health and education. The Gini index is also suspected to be endogenous as it is correlated with infrastructure, health and education. Hence, it is also instrumented.

Next, we estimate our second model using net remittances instead of remittances received, to estimate the effects of net remittances on poverty, where, net remittances are taken as percentage of GDP (received less paid). The first equation (2a) is the final regression and the second (2b) and third (2c) equations are the first stage regressions.

The following equations are estimated in model 2:

$$povt = a + b_1(netremit) + b_2(gdpcap) + b_3(gini) + e.....(2a)$$

$$gdpcap = c + d_1(instr) + d_2(health) + d_3(educ) + z_1.....(2b)$$

$$gini = g + h_1(instr) + h_2(health) + h_3(educ) + z_2.....(2c)$$

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resident and non-resident individuals. Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by non-resident entities. Data are the sum of two items defined in the sixth edition of the IMF's Balance of Payments Manual: personal transfers and compensation of employees" (World Development Indicators, 2014).

Where, 'netremit' is the net remittances, which is taken as the difference between remittances received as a percentage of GDP and the remittances paid as a percentage of GDP. The model has the same specifications as the previous one. The same instruments are used.

The variance inflation factor was calculated to check for multi-collinearity. Correlation between the variables was also checked and was found to be at acceptable levels. The standard errors are robust to heteroskedasticity. Our results control for country heterogeneity.

3. RESULTS

The results of our analysis are presented in the following tables. The dependent variable is poverty. Tables 1 and 2 show the first stage regression results. Table 1 shows equations 1b and 2b, with 'gdpcap' as the dependent variable and table 2 shows equations 1c and 2c, with 'gini' as the dependent variable. Table 3 shows the results of our final equations (1a and 2a), with poverty as the dependent variable.

Table 1: First stage regressions: gdpcap

Dependent Variable: gdpcap		
Independent Variables	model 1	model 2
remit	-95.52***	-
	(-2.96)	
netremit	-	-103.51**
		(-2.57)
health	451.98***	453.62***
	(5.35)	(5.57)
educ	-3.922	-6.16
	(-0.23)	(-0.37)
instr	6.723**	6.543**
	(1.49)	(1.43)
centered R-square	0.61	0.6
uncentered R-square	0.87	0.87
F-statistic	27.26	25.38
Number of observations	43	43

Note: ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively.
t-statistics are reported in parentheses.

In the first stage GDP per capita regressions, we observe that health and infrastructure have a positive and significant relationship with GDP per capita. Though, education is negative, its impact is insignificant.

Table 2: First stage regressions: gini

Dependent Variable: gini		
Independent Variables	model 1	model 2
remit	-0.008	-
	(-0.06)	
netremit	-	-0.02
		(-0.13)
health	2.441***	2.43***
	(9.03)	(9.13)
educ	-0.317***	-0.31***
	(-3.66)	(-3.65)
instr	-0.05**	-0.05**
	(-2.22)	(-2.23)
centered R-square	0.67	0.67
uncentered R-square	0.98	0.98
F-statistic	66.31	69.18
Number of observations	43	43

Note: ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively.
t-statistics are reported in parentheses.

In the Gini index regressions, we observe that education and infrastructure have negative and significant relationship with inequality whereas on the other hand, health has a significant positive relationship with inequality, which is surprising. This might be attributed to the case that the status of health is highly correlated with income levels.

Table 3: Remittances received and Net remittances (2sls results)

Dependent Variable: povt		
Independent Variables	model 1	model 2
remit	-0.861**	-
	(-2.36)	
netremit	-	-0.94**
		(-2.19)
gdpcap	-0.008***	-0.008***
	(-3.59)	(-3.51)
gini	0.757***	0.8***
	(2.57)	(2.62)
centered R-square	-0.15	-0.21

uncentered R-square	0.308	0.26
Hansen J Statistic	1.42	1.44
Number of observations	43	43

Note: ***, ** and * denote statistical significance at 1%, 5% and 10% level respectively.
t-statistics are reported in parentheses.

Our final regressions show that remittances received are negatively and significantly related to poverty. For every unit increase in remittances, poverty falls by 0.8 percentage points. Similarly for net remittances, there is a significant negative impact on poverty. For a one percent increase in migration, poverty falls by 0.94 percentage points. As expected, GDP per capita has a very significant negative impact on poverty. We find that the Gini index moves in the same direction as poverty. An increase in inequality results in an increase in poverty. This relationship is also significant. Our results imply that remittances are effective in reducing poverty in developing countries.

4. CONCLUSION

This paper explored the effects of remittances received and net remittances received on poverty in developing countries. We used data on poverty and international remittances from 25 developing countries. We have found that both, total remittances received and net remittances received have a negative and significant effect on poverty. As expected, a higher GDP per capita implies a lower poverty headcount ratio. Also, higher inequality ratios imply higher poverty rates. We can say that remittances from outside the country are an effective way to combat poverty in developing countries. This paper supports the view that increased inward remittances help reduce poverty in developing countries.

However, there are shortcomings that are attached to working in this area. It is in the nature of the data available on remittances. Quite a few countries do not publish data on remittances which results in gaps in the data. Also, as we stressed above, a lot of remittances pass through informal channels and are therefore, not recorded. Hence, the remittance figures may be under-reported.

5. REFERENCES

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APPENDIX 'A'

LIST OF DEVELOPING COUNTRIES INCLUDED

Argentina, Armenia, Bangladesh, Belarus, Colombia, Dominican Republic, Ecuador, Georgia, India, Indonesia, Kyrgyz Republic, Macedonia FYR, Madagascar, Mexico, Moldova, Montenegro, Panama, Paraguay, Peru, Romania, Serbia, Tunisia, Turkey, Ukraine, Uruguay.

APPENDIX 'B'

DATA DESCRIPTION AND SOURCE

VARIABLE	DESCRIPTION
povt	Poverty headcount ratio at $1.25 a day (PPP) (% of population)
remit	Personal remittances, received (% of GDP)
netremit	Net remittances, % of GDP (received less paid)
gdpcap	GDP per capita (constant 2005 US$)
gini	Gini Index
instr	Telephone lines and mobile cellular connections (per 100 people)
educ	School enrollment, secondary (% net)
health	Life expectancy at birth, total (years)

Source: World Development Indicators, World Bank.

APPENDIX 'C'

DESCRIPTIVE STATISTICS OF VARIABLES

Variable:	2000			2005			2010		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
povt	19	17.61	21.51	25	12.24	17.19	25	9.68	18.39
remit	22	3.07	3.53	23	5.28	7.07	24	6.11	7.18
netremit	22	2.73	3.31	23	4.79	6.44	24	5.27	6.15
gdpcap	25	2546.4	1906.2	25	2948.3	1999.7	24	3468.5	2276.1
gini	14	45.05	10.47	25	40.74	8.8	24	38.91	8.89
instr	23	20.28	13.42	22	56.55	30.21	25	122.28	40.8
educ	13	61.25	15.51	17	68.69	12.7	20	75.53	10.78
health	25	70.19	3.96	25	71.24	3.5	25	72.49	3.13

APPENDIX 'D'

COUNTRIES WITH THE HIGHEST AND LOWEST OBSERVATIONS

Variable:	Country with lowest observations			Country with highest observations		
Year	2000	2005	2010	2000	2005	2010
povt	Belarus (0.33%)	Serbia (0%)	Montenegro (0%)	Madagascar (79.33%)	Madagascar (67.83%)	Madagascar (81.29%)
remit	Argentina (0.02%)	Turkey (0.18%)	Argentina (0.13 %)	Moldova (13.86%)	Moldova (30.62%)	Kyrgyz Republic (26.4%)
netremit	Kyrgyz Republic (-1.57%)	Madagascar (-0.20%)	Panama (-0.72%)	Moldova (11.69%)	Moldova (29.07%)	Moldova (21.00%)
gdpcap	Madagascar (285.96)	Madagascar (275.47)	Madagascar (275.36)	Mexico (7723.43)	Mexico (7858.76)	Mexico (8117.35)
gini	Belarus (27.71%)	Belarus (27.39%)	Ukraine (24.82%)	Colombia (58.68%)	Colombia (55.06%)	Colombia (55.51%)
instr	Bangladesh (0.59)	Madagascar (3.36)	Madagascar (37.91)	Turkey (54.26)	Montenegro (113.9)	Montenegro (212.11)
educ	Dominican Republic (39.78%)	Bangladesh (42.77%)	Bangladesh (47.13%)	Ukraine (90.56%)	Armenia (84.02%)	Belarus (92.71%)
health	Madagascar (58.47 years)	India (63.36 years)	India (65.13 years)	Panama (75.11 years)	Uruguay (75.6 years)	Mexico (76.68 years)