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Effect of remittances on household consumption in African and Asian countries: A quantile regression approach

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Abstract

The impact of remittances on poverty has stimulated a number of empirical studies. However, these studies have relied on a regression framework in which the analysis is focused on the mean effects of remittances. In this paper, we use a quantile regression method to examine the effect of remittances on household consumption in African and Asian countries at various locations of the consumption distribution. The results show that remittances significantly increase household consumption and the effect is larger at lower levels of consumption. If remittances are to be used as a poverty-reducing tool, African and Asian countries should do more in reducing transaction costs and bringing recipient households into the formal financial sector in order to channel their savings into productive uses that can generate long-term benefits.

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1. Introduction

Poverty reduction in developing countries is a great concern for economists, policy makers and international communities. Consequently, it is often a main theme addressed in political and international agendas. Remittances are considered to be a major source of income for households in developing countries. Remittance flows to Sub-Saharan Africa as a share of GDP has increased from 0.9 percent in 1994 to 1.6 percent in 2004 and reached 2.3 percent in 2014. In South Asia, remittances have increased from 2.2 percent of GDP in 1994 to 4.5 percent in 2014. Remittance flows to high income countries are relatively small, about 0.3 percent of GDP. There is evidence that remittance flows to Africa are underreported as formal financial sector is less developed in this region than in other developing countries. It is estimated that informal remittances could add at least 50 percent of the recorded remittances to developing countries (World Bank, 2006). According to Freund and Spatafora (2005) informal remittances to Sub-Saharan Africa amount to 45-65 percent of official flows, compared to only 5-20 percent in Latin America. Given the increasing volume of remittances to developing countries, it is worth looking at their impact on household consumption and poverty in remittance-receiving countries. Theoretically, there are three competing views regarding the impacts of remittances on poverty and inequality. These impacts depend on the type of self-selection of migrants and whether households spend remittances on consumption or investment. The classical Roy (1951) model explains that self-selection is driven by comparative advantage of individuals. The distribution of income in the host and the home countries determines whether individuals with higher or lower skills tend to migrate: the less skilled are those most likely to migrate from countries with high income inequality to countries with low income inequality (Borjas, 1987). According to the first view, if migrants are negatively selected and recipient households spend a significant portion of the remittances on investment, remittances will increase receiving household's consumption and investment and will reduce both poverty and income inequality (Adams, 1998, 2010; Taylor and Wyatt, 1996). The second view also assumes negative selection and argues that households rely on remittances mainly for consumption and become dependent on remittances. Hence, remittances will increase both poverty and income inequality (Adams, 1989; Ban *et al*., 2016). The third view postulates a positive selection implying that richer households receive remittances as they are more able to reduce the costs of migration (Barham and Boucher, 1998; Jasso and Rosenzweig, 1990; Chiswick, 1999). Under this hypothesis, remittances may either increase or reduce poverty but will increase income inequality.

A number of empirical studies have examined the impact of remittances on poverty and inequality. The general finding from these studies is that remittances significantly reduce poverty (see Adams (2011) for a literature review). For example, Gupta *et al.* (2009) found that remittances mitigate poverty in Sub-Saharan Africa. Adams (2006) and Beyene (2014) obtained the same finding in the case of Ghana and Ethiopia, respectively. In a study of 71 countries, Adams and Page (2005) found that remittances bring a decline in the share of people living in poverty. Imai *et al.* (2014) also found that remittances contribute to poverty

reduction in a panel of 24 Asian countries. Other studies also confirmed a poverty-reducing impact from remittances (e.g., Gustafsson and Makonnen, 1993; Acosta *et al*., 2008; Kalim and Shahbaz, 2009; Anyanwu and Erhijakpor, 2010; Pradhan and Mahesh, 2016). An interesting study conducted by Adams and Cuecuecha (2010) showed that the impact of remittances on poverty depends on how they are spent. Using a large household data set from Guatemala they found that households receiving remittances spend less at the margin on consumption than do households with no remittances. Instead of spending on consumption, recipient households tend to spend more on investment goods like education, health and housing. In a study for Tajikistan, Clément (2011) showed that international remittances significantly increase the household consumption level but have a negative impact on investment expenditures.

A major limitation of these studies is that they have primarily relied on econometric methods that estimate the mean effect of remittances on poverty assuming implicitly that the effect along the distribution of household consumption is the same. While estimating how 'on average' remittances affect household consumption and poverty yields straightforward interpretations, these studies may miss how remittances affect households at different points of the consumption distribution. For example, while remittances may matter for average household, it would be useful to know if they matter for households at the left tail (poorest) of the consumption distribution. In short, we should not only address the question, 'do remittances matter for poverty reduction?' but we should also ask the question, 'for whom do remittances matter?' It is likely that the effect of remittances is different for poor and non-poor households.

Unlike the previous studies, this paper examines the impact of remittances on household consumption using the quantile regression methodology developed by Koenker and Bassett (1978). The advantage of quantile regressions relies in the possibility of investigating the effect of remittances at many points of the conditional distribution of consumption, not only at the mean but also in the tails. Few studies have applied quantile regressions to investigate the remittances-poverty nexus. Serino and Kim (2011) examined the impact of remittances on poverty in a sample of 66 developing countries from 1981 to 2005. They found that remittances alleviate poverty, especially in the poorest countries. Their study covers a wide range of developing countries with different income levels and the findings may not be applicable to all regions at the same way. In this paper, we argue that Asian and African countries are different in many aspects and must be studied separately. Mughal and Anwar (2012) examined the impact of remittances on poverty and inequality in Pakistan using region-wise and time series remittances data. They found that remittances substantially lower poverty and inequality. The impact of foreign remittances on poverty and inequality reduction is much stronger than that of internal remittances. Furthermore, among the three main remittance-sending regions, remittances coming from North America have the strongest consumption inequality-reducing effect in Pakistan. Bang *et al*. (2016) also tested the impact of remittances on household expenditures in Kenya using survey data. They found that while remittances increase household expenditure at all levels of the distribution, the impact is greatest for poorer households. However, a shortcoming of this study is that it tests the impact

of receiving remittances and not the amount of remittances received on household expenditure. It is obvious that the amount of remittances matters most for poverty and inequality reduction. In addition, they used static survey data comprising 1942 households. As well noted by the Authors, this sample is relatively small and narrow, and the findings may not be representative of all households in Kenya. The Authors suggested cross-country studies to test the external validity of their findings. Given that poverty reduction is one of the greatest challenges for Asian and Sub-Saharan African countries, these two regions are interesting cases for the analysis of the impact of remittances on household consumption.

The remainder of the article is organized as follows. Section 2 outlines the econometric methodology and describes the data. Section 3 discusses the empirical results, while Section 4 concludes.

2. Model, methodology and data

2.1 The empirical model

To examine the effect of remittances on household consumption, we specify the empirical model as follows:

$$C_{it} = \theta_0 + \theta_1 I_{it} + \theta_2 FIN_{it} + \theta_3 REM_{it} + \theta_4 T_{it} + \mu_{it} \quad (1)$$

where i is for country i in the panel, t refers to the time period, C stands for household consumption per capita, I refers to income measured by real GDP per capita, FIN is financial development indicator, REM denotes remittances as a share of GDP, and T stands for trade openness. It is expected a positive effect of income, remittances, financial development and trade openness on household consumption.

Eq.(1) assumes the marginal effect of remittances on consumption to be the same regardless the level of consumption. If the effect could be different for households with different consumption levels, this linear relationship may be misspecified. In this study, we are interested in estimating this model in a way that identifies differences in the response of household consumption to remittances for countries at various points of the distribution of consumption. To this end, we use the quantile regression approach.

2.2 The quantile regression approach

The quantile regression method was first introduced by Koenker and Bassett (1978). Compared to mean regressions, this method is less sensitive to outlier observations and provides a more efficient estimator when the error term is non-normal. Furthermore, it allows for the estimation of the effects of covariates at different points of the distribution of the dependent variable. The quantile regression model can be formulated as follows:

$$q(C_{it}) = \theta_{0\tau} + \theta_{1\tau} I_{it} + \theta_{2\tau} FIN_{it} + \theta_{3\tau} REM_{it} + \theta_{4\tau} T_{it} + \mu_{it} \quad (2)$$

where $q(C_{it})$ is the conditional quantile of household consumption. Eq. (2) can be written as follows:

$$y_{it} = x_{it}\theta_{\tau} + \varepsilon_{it} \tag{3}$$

where $x_{it} = \left(1, I_{it}, FIN_{it,}, REM_{it}, T_{it}\right)$ is the vector of explanatory variables; θ_{τ} are the $k \times 1$ regression coefficients at the τ-*th* quantile of the dependent variable *y*.

Contrary to OLS which is based on minimizing the sum of squared residuals, the quantile regression estimator minimizes an asymmetrically weighted sum of absolute errors:

$$\min_{\theta}\left[\sum_{y_{it} \geq x_{it}\theta_{\tau}} \tau\left|y_{it} - x_{it}\theta_{\tau}\right| + \sum_{y_{it} \leq x_{it}\theta_{\tau}} (1-\tau)\left|y_{it} - x_{it}\theta_{\tau}\right|\right] = \min_{\theta}\sum_{t=1}^{T}\rho_{\tau}\left(y_{it} - x_{it}\theta_{\tau}\right) \tag{4}$$

where $\rho_{\tau}(z)$ is the check function defined as $\rho_{\tau}(z) = z\left(\tau - I_{(z<0)}\right)$, $0 < \tau < 1$. Here I(·) denotes the indicator function. The special case $\tau = 0.5$ which minimizes the sum of absolute residuals corresponds to median regression. The first quartile is obtained by setting $\tau = 0.25$ and so on. As one increases τ from 0 to 1, one traces the entire distribution of private consumption conditional on covariates. It is in this way that quantile regression allows for parameter heterogeneity in the response of household consumption to remittances and other explanatory variables.

Recent developments in econometrics allow for estimation of quantile regression models and at the same time controlling for unobserved heterogeneity. As suggested by Canay (2011), a simple two-step estimator enables both the inclusion of fixed effects and a varying slope along the dependent variable conditional distribution. Following this approach, a fixed effects regression is estimated as a first step. As a second step, these fixed effects are used to demean the dependent variable and this transformed variable is taken as the dependent variable in the quantile regression.

2.3 Data and descriptive statistics

The empirical analysis uses annual time series data for 19 selected countries divided into two groups: 11 Sub-Saharan African countries and 8 Asian countries. The list of countries is presented in Table 1. The coverage of countries and time period are dictated by the availability of continuous data on all relevant variables. Variables used included household final consumption per capita in constant 2005 US dollar, remittances as share of GDP, real GDP per capita in constant 2005 US dollar, the ratio of domestic credit to private sector by banks as share of GDP as indicator of financial development and financial constraints, trade openness measured as the ratio of exports and imports to GDP. In applying quantile regression to household consumption, we are able to address the impact of remittances on poverty and inequality simultaneously in one unified framework (Ban *et al.*, 2016). The data

set was obtained from the 2015 World Development Indicators by the World Bank. All the data were converted into natural logarithms.

Table 1: List of countries

Regions	Countries	Sample period
Sub-Saharan Africa	Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Ghana, Kenya, Mali, Niger, Nigeria, Senegal, South Africa.	1981-2013
Asia	Bangladesh, China, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand	1987-2013

Table 2 gives some descriptive statistics of the data. The Table shows one measure of tails, *i.e*. the Kurtosis among other descriptive statistics. Kurtosis measures the peakedness or flatness of the distribution of the series. As can be seen from Table 1, all variables are leptokurtic in the case of African countries. Another statistic is the Skewness that measures the asymmetry of the distribution of the series. A formal test of normality combining the Kurtosis and the Skewness is given by the Jarque-Bera test statistic, which rejects the null hypothesis of normality for all series in both panels.

Table 2: Descriptive statistics of variables (in log)

Variables	Obs.	Mean	Std. Dev.	Min	Max	Kurt.	Skew.	JB
Panel A: African countries								
Household consumption	363	6.18	0.71	5.13	8.28	4.69	1.36	155.6
Income	363	6.50	0.78	5.52	8.71	4.82	1.44	176.78
Remittances	363	0.05	1.53	-4.75	2.56	3.03	-0.75	34.92
Credit	363	2.82	0.67	0.43	4.36	3.90	-0.28	17.16
Trade	363	3.95	0.32	1.84	4.75	9.75	-1.35	801.3
Panel B: Asian countries								
Household consumption	216	6.52	0.65	5.49	8.21	2.43	0.47	11.08
Income	216	7.03	0.80	5.74	8.86	2.30	0.48	12.64
Remittances	216	0.28	1.35	-2.91	2.58	2.12	-0.25	9.24
Credit	216	3.81	0.71	2.58	5.11	1.58	0.21	19.71
Trade	216	4.00	0.67	2.51	5.39	2.31	0.25	6.54

Note: JB refers to the Chi2 statistic from the Jarque-Bera test of normality.

3. Results and discussion

Before carrying out the empirical analysis, we test for the order of integration of the variables using Levin, Lin and Chu (LLC, 2002), Im, Peseran and Shin (IPS, 2003) and Maddala and Wu (1999) unit root tests. The results reported in Table 3 strongly suggest that the variables in level are non-stationary and stationary in first differences. Since the work of Perron (1989), it is well-known that the failure to take into account the potential presence of structural breaks may lead to misleading inference regarding the order of integration. A number of panel unit root tests have been developed as the extensions of the standard ADF unit root test for time series. In most of these tests the statistics for the panel are calculated as the weighted average of the individual test statistics. In this paper, we extend the Zivot and Andrews (ZA) (1992) unit root test: we first compute the ZA test statistics for each individual, and then we calculate the test statistic for the panel as the average of the individual test statistics. The results not

reported here confirm, even after taking into account the presence of structural breaks, integration of order one for all series.

Consequently, standard panel cointegration tests can be employed to estimate the long-run relationships. The results from Pedroni heterogeneous panel cointegration test are reported in Table 4. They indicate the existence of a long-run relationship between variables. The results from Johansen-Fisher tests reported in Table 5 also suggest the same conclusion. We also perform the Johansen-Fisher panel cointegration test by quantile. The results non-reported here confirm the existence of a long-run relationship between variables at all quantiles. Therefore, a long-run relationship among the variables can be estimated for each quantile.

Table 3: Results of panel unit root tests

	Level			First difference		
Variables	IPS	LLC	PP Fisher	IPS	LLC	PP Fisher
African countries						
Consumption	-0.898	-2.077*	27.489	-15.535*	-15.166*	214.645*
	(0.184)	(0.018)	(0.193)	(0.000)	(0.000)	(0.000)
Income	2.681	0.934	12.886	-10.094*	-9.205*	170.694*
	(0.996)	(0.825)	(0.936)	(0.000)	(0.000)	(0.000)
Remittances	0.887	-0.965	12.227	-15.991*	-16.441*	245.468*
	(0.812)	(0.167)	(0.952)	(0.000)	(0.000)	(0.000)
Credit	-0.028	-1.914*	16.072	-12.802*	-12.464*	214.768*
	(0.488)	(0.027)	(0.812)	(0.000)	(0.000)	(0.000)
Trade	0.136	-1.324**	20.658	-14.326*	-14.646*	233.490*
	(0.554)	(0.092)	(0.541)	(0.000)	(0.000)	(0.000)
Asian countries						
Consumption	0.799	0.298	8.541	-6.860*	-6.965*	73.692*
	(0.788)	(0.617)	(0.931)	(0.000)	(0.000)	(0.000)
Income	0.248	-0.524	9.655	-5.540*	-5.948	59.660*
	(0.598)	(0.299)	(0.884)	(0.000)	(0.000)	(0.000)
Remittances	0.687	0.070	9.296	-12.191*	-12.516	137.12*
	(0.754)	(0.528)	(0.900)	(0.000)	(0.000)	(0.000)
Credit	-0.136	-1.065	10.618	-6.432*	-5.820	88.359*
	(0.445)	(0.143)	(0.832)	(0.000)	(0.000)	(0.000)
Trade	0.339	-0.939	14.903	-12.382*	-13.707	149.81
	(0.633)	(0.173)	(0.531)	(0.000)	(0.000)	(0.000)

Note: IPS, LLC and PP-Fisher are the Im, Pesaran and Shin (2003), Levin, Lin and Chu (2002) and Maddala and Wu(1999) Fisher-PP panel unit root tests. Values in parentheses are *p-value*. * (**) signifies rejection of the unit root hypothesis at the 5% (10%) level.

Table 4: Pedroni (1999) panel cointegration tests

	Panel statistics				Group statistics		
	v-stat.	rho-stat.	PP-stat	ADF stat.	rho-stat.	PP-stat	ADF stat.
African countries	-0.594	0.103	-2.326*	-2.848*	-0.507	-4.979*	-5.060*
	(0.723)	(0.541)	(0.010)	(0.002)	(0.305)	(0.000)	(0.000)
Asian countries	0.532	-0.260	-3.041*	-3.378*	0.652	-2.748*	-3.283*
	(0.297)	(0.397)	(0.001)	(0.000)	(0.743)	(0.003)	(0.000)

Note: The null hypothesis is that the variables are not cointegrated. The test statitics are normalized so that the asymptotic distribution is standard normal. Figures in parentheses are the probability values. ** and * indicate rejection of the null at the 10% and 5% levels, respectively

Table 5: Johansen panel cointegration test

Number of coint. eqs.	**African countries**				**Asian countries**			
	Trace test	Prob.	Max-eigen value test	Prob.	Trace test	Prob.	Max-eigen value test	Prob.
None	105.8*	0.000	77.00*	0.000	117.6*	0.000	106.8*	0.000
At most 1	47.61*	0.001	35.67*	0.032	36.84*	0.002	30.05*	0.017
At most 2	23.93	0.350	18.05	0.702	16.45	0.422	16.09	0.446
At most 3	17.10	0.758	13.09	0.930	8.558	0.930	6.981	0.973
At most 4	27.41	0.195	27.41	0.195	18.55	0.292	18.55	0.292

Note: ** and * indicate rejection of the null at the 10% and 5% levels, respectively.

In a panel framework, several standard estimators can be used to estimate long-run relationships: OLS, Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS). Chen *et al*. (1999) showed that the FMOLS and DOLS estimators may be more promising in cointegrated panel regressions. However, Kao and Chiang (2000) showed that both the OLS and FMOLS exhibit small bias and that the DOLS estimator appears to outperform both estimators. In this paper, we use DOLS as our baseline regression. We report in Tables 6 and 7 detailed results from quantile regression for the 10th, 25th, 50th, 75th and 90th quantiles. Figures 1 and 2 illustrate how the magnitude of the coefficients of the covariates varies over quantiles of the dependent variable.

Table 6: Dynamics OLS and panel fixed effects quantile regression results for African countries

	DOLS	Quantile regression					Test of symmetry[1]		Test of equality[2]
		q10	q25	q50	q75	q90	q10=q90	q25=q75	
Income	0.689*	0.723*	0.723*	0.703*	0.684*	0.663*	6.10*	4.09*	2.55*
	(6.941)	(36.19)	(39.48)	(50.43)	(44.21)	(42.23)	(0.014)	(0.043)	(0.038)
Remittances	0.032*	0.021*	0.030*	0.020*	0.013**	0.016*	0.22	4.06*	1.35
	(2.398)	(2.68)	(3.91)	(4.01)	(1.93)	(2.04)	(0.642)	(0.044)	(0.250)
Credit	0.024	0.016	0.013	0.024*	0.053*	0.080*	3.93*	3.86*	3.02*
	(0.727)	(0.57)	(0.81)	(2.32)	(3.16)	(4.71)	(0.048)	(0.050)	(0.018)
Trade	-0.121*	-0.095*	-0.088*	-0.059*	-0.064*	-0.062*	0.70	1.43	0.83
	(-2.061)	(-3.09)	(-4.53)	(-3.33)	(-4.94)	(-2.28)	(0.402)	(0.231)	(0.505)

Note: Asymptotic standard errors are given below each parameter estimate (heteroskedasticity robust for DOLS; bootstrapped for quantiles based upon 1000 bootstrapping repetitions). The asterisks ** and * denote significance at the 10% and 5% levels, respectively. (1) F-statistic and associated p-values for symmetry test. (2) F-statistic and associated *p-values* are reported for the test of equality of the coefficients across quantiles (i.e. q10=q25=q50=q75=q90).

Table 7: Dynamics OLS and panel fixed effects quantile regression results for Asian countries

	DOLS	Quantile regression					Test of symmetry[1]		Test of equality[2]
		q10	q25	q50	q75	q90	q10=q90	q25=q75	
Income	0.896*	0.879*	0.860*	0.851*	0.808*	0.846*	0.54	4.65*	1.98**
	(13.154)	(23.02)	(43.24)	(33.81)	(32.79)	(26.79)	(0.463)	(0.032)	(0.090)
Remittances	-0.032	0.056*	0.038*	0.032*	0.025*	0.011	9.41*	2.75**	2.59*
	(-0.602)	(5.42)	(5.54)	(3.28)	(3.93)	(1.08)	(0.002)	(0.098)	(0.037)
Credit	-0.206**	-0.043*	-0.078*	-0.083*	-0.074*	-0.093*	1.73	0.06	1.33
	(-1.769)	(-1.99)	(-4.52)	(-7.40)	(-6.57)	(-2.83)	(0.190)	(0.805)	(0.260)
Trade	-0.085	-0.067*	-0.034*	-0.007	0.017	-0.001	3.43**	5.34*	2.23**
	(-0.705)	(-2.69)	(-2.10)	(-0.30)	(0.84)	(-0.05)	(0.065)	(0.021)	(0.067)

Note: Asymptotic standard errors are given below each parameter estimate (heteroskedasticity robust for DOLS; bootstrapped for quantiles based upon 1000 bootstrapping repetitions). The asterisks ** and * denote significance at the 10% and 5% levels, respectively. (1) F-statistic and associated p-values for symmetry test. (2) F-statistic and associated *p-values* are reported for the test of equality of the coefficients across quantiles (i.e. q10=q25=q50=q75=q90).

The DOLS results indicate that income increases household consumption in African and Asian countries. Remittances have positive effect on household consumption in African countries but no significant effect in Asian countries. Credit provided by banks is not significantly related to household consumption in both panels. Openness to trade reduces consumption in African countries but has no effect in Asian countries. In both panels consumption responds more strongly to income than to remittances.

The quantile regression results suggest some important differences across different points in the conditional distribution of household consumption. The impact of income on household consumption is positive and larger in countries with lower levels of consumption. As shown in Figure 1, the impact of income is decreasing over quantiles. For example, a 10% increase in income increases household consumption by 7.2% at the lower level of consumption but by 6.6% at the higher level of consumption. Raising income levels of the poor will stimulate consumption and reduce poverty.

The impact of remittances is also positive and decreasing as we move from lower to higher quantiles. In the case of African countries, a 10% increase in the share of remittances in income increases consumption by 0.3% for households at the left tail of the consumption distribution but by 0.16% in the right tail of the distribution. In the case of Asian households, a 10% increase in remittances increases consumption by 0.56% for households at the left tail of the consumption distribution but by 0.11% in the right tail of the distribution. These findings suggest that remittances contribute to increase household consumption and reduce poverty with a greater effect on poorest households.

Another interesting result is the coefficient on domestic credit to private sector. This variable was found to be insignificant in the DOLS regressions which focus on the mean effect. In the quantile regressions this variable has various impacts on countries with different levels of consumption. The coefficient is positive and not significant in African countries at the 0.10 and 0.25 quantiles, but it is positive and significant for the 0.5 quantile (median) and higher, suggesting that credit provided by banks increases consumption for households with higher

levels of consumption. For Asian countries, on the contrary, the effect of bank credit is negative at all quantiles, suggesting that households do not benefit from credits provided by banks. Credit constraints are strong in many Asian countries. Facing stricter constraints on borrowing money, households rely more on their own savings when facing unexpected large expense or shrink of income. Openness to trade reduces consumption in African countries at all levels of the consumption distribution whereas it deteriorates the situation of poorer households in Asia. This finding confirms the evidence that the poor do not always benefit from international trade (e.g., UNCTAD, 2004; Nicita, 2009; Nissanke and Thorbecke, 2010). The impact of trade on poverty is conditioned by the level of development of a country and the structure of its economy and of its exports in particular (UNCTAD, 2004). Calderon, Loayza and Schimdt-Hebbel (2004) found that the effect of trade openness on income is nearly zero for countries with low levels of income and positive for countries with high levels of income. On the other hand, trade openness benefits more the countries with a high level of human capital (Tsai *et al*., 2012). This is because the diffusion of technology depends on the stock of human capital. Another reason is that trade openness pushes a country towards a specialization in non-dynamic sectors that do not generate significant technological progress and long-run growth (Young, 1991). Sub-Saharan African countries have initial comparative advantage in non-dynamic agricultural sector and thus do not benefit from advantages of trade. The structure of their exports is dominated by primary products which generated more than 80% of export earnings. The relative prices of these primary goods are declining leading to a decline in incomes in the agricultural sector. In addition, unanticipated exogenous shocks such as flood, drought and crop pests often exacerbate poverty in most African countries. Finally, population growth is another factor mitigating the gains from trade and causing the declining of per capita consumption.

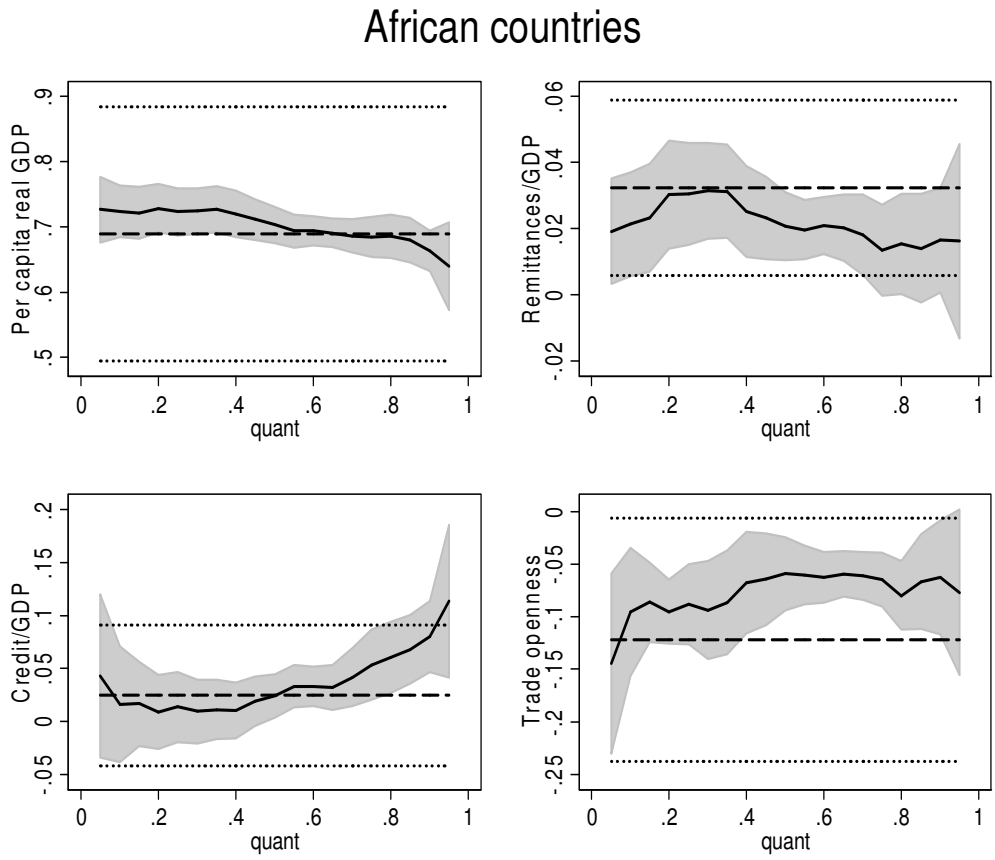

Figure 1: The parameter estimates of quantile and DOLS regressions and their confidence intervals: evidence for African countries.

Note: The x-axis represents the conditional quantile of household consumption. The horizontal dashed line represents the DOLS estimates. The two dotted lines depict the 95 percent confidence intervals for the DOLS estimates. The solid line represents the quantile regression estimates; and the shaded grey area plots the 95 percent confidence band for the quantile regression estimates.

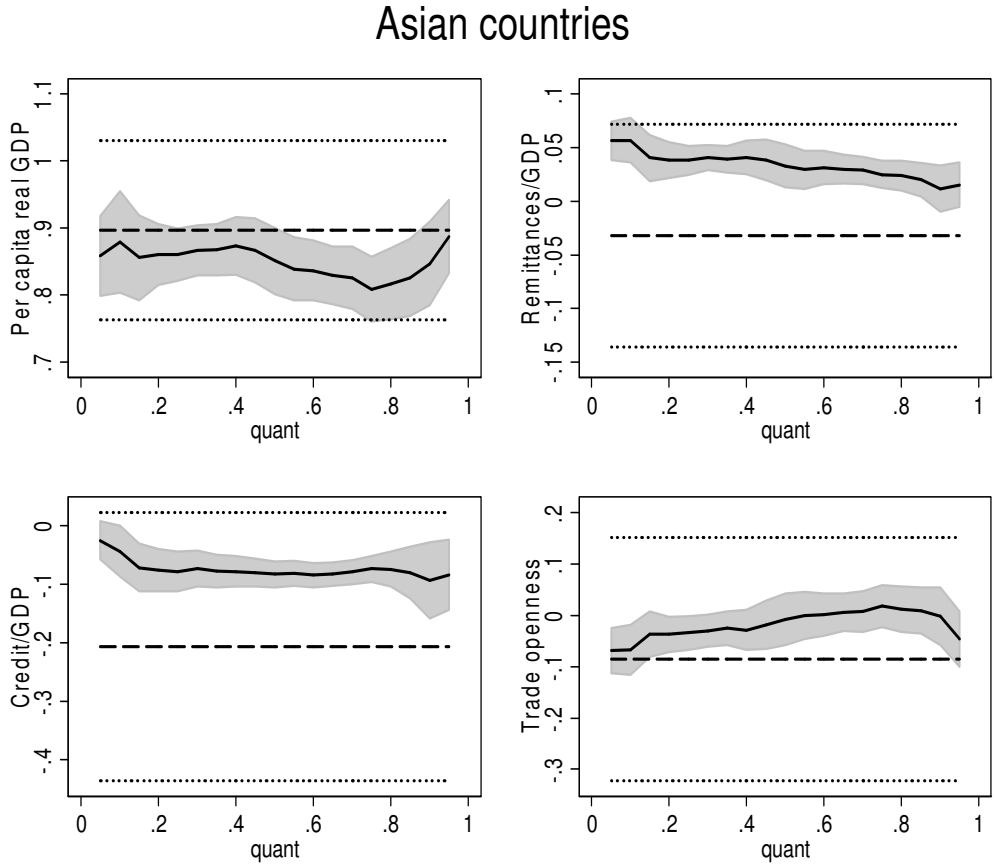

Figure 2: The parameter estimates of quantile and DOLS regressions and their confidence intervals: evidence for Asian countries.

Note: The x-axis represents the conditional quantile of household consumption. The horizontal dashed line represents the DOLS estimates. The two dotted lines depict the 95 percent confidence intervals for the DOLS estimates. The solid line represents the quantile regression estimates; and the shaded grey area plots the 95 percent confidence band for the quantile regression estimates.

4. Conclusion

This paper has examined the effect of remittances on household consumption in African and Asian countries. Previous studies on this issue focused on the mean effect by using mean regression approaches. In this study we rely on a quantile regression approach in order to assess the effect of remittances on household consumption at various locations of the consumption distribution.

The baseline dynamic OLS regression results support the findings in the literature regarding the improving effect of remittances on household consumption for African countries but not for Asian countries. However, quantile regressions reveal the sensitivity of the impact to the distribution of household consumption. Remittances consistently increase household consumption in all cases, with the effect larger at lower levels of consumption. This finding suggests that remittances can contribute to alleviate poverty in African and Asian countries.

The main implication from this finding is that African and Asian countries can look at remittances as a poverty-reducing tool in designing poverty-reduction policies. To increase

significantly the amount of international remittances and their poverty-reducing effect, they should do more in reducing transaction costs. Indeed, the costs of sending remittances to Africa are among the highest in the world. On average, they represent more than 10% of the amount sent. Policies need to encourage a competitive environment and promote cost-effective payment technologies attractive to consumers. Lowering the transaction costs of remittances to Sub-Saharan Africa will increase the flow of remittances through official channels and this may increase domestic demand. It is also important to bring remittance-receiving households into the formal financial sector and channel their savings into productive uses that can generate long-term benefits.

Despite the promising results, this study suffers from a limitation. The empirical analysis has been conducted using macro-level data. The impact of remittances on consumption and poverty might be due to other relevant factors such as foreign direct investment (FDI), demographic structure and institutions. This is true for many Asian countries such as India and China where the decrease in poverty is not due to remittances only. A big share of remittances in Asia is received by India and China which are also recipients of gigantic FDI inflows. Our study did not separate the impact of FDI and other relevant factors from the remittances. This limitation constitutes an area of fruitful future research.

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