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ABSTRACT

This paper investigates the impact of remittances on poverty and inequality in Nigeria. In contrast to the existing literature, our methodology of instrumental variable quantile regression (IVQR) explicitly demonstrates the differential marginal impact of remittances for households at different levels of the conditional expenditure distribution. In tracing this heterogeneous impact, we are further able to address the effect of remittances on poverty and inequality simultaneously in one econometric model. Our results based on the Nigerian Migration Household Survey 2009 show that remittances reduce poverty by increasing household expenditures reveal a positive marginal impact of remittances at all but the highest quantiles of the conditional distribution of household expenditure, with the impact being the greatest up to the 12th quantile. While this unambiguously supports the poverty alleviation role of remittances documented in the literature, the distributional impact is more nuanced: The marginal effect of remittances follows a U-shape over most of the household expenditure distribution, which suggests that remittances may 'hollow out' the middle class. Specifically, households lying between the 13th to the 35th quantile gain less from receiving remittances than households on either side of this range.

1. Introduction

Despite ranking among the top ten recipient countries for remittances in terms of dollar value for each of the last six years and being the highest ranked African nation over the same period, the impact of remittance inflows to Nigeria on poverty and the distribution of income remains relatively underexplored.[1] This is even more surprising given that nearly 50 percent of Nigerians live below the national poverty line and the country has attracted international scrutiny for its difficulties reducing inequality.[2] Inparticular, there is a distinct lack of studies that investigate the distributional impact of remittance income at the household level. The present study is an attempt to fill this void.

The limited literature investigating the impact of remittances on poverty and the distribution of income in Nigeria (Ajaero et al., 2018; Chukwuone et al., 2012; Odozi et al., 2010) has in generalpainted a positive picture. Consistent with existing studies,

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we find a positive marginal impact of receiving remittances at all but the very highest quantiles of the conditional distribution of household expenditure, with the marginal impact being the highestup to the 12[th]quantile. To give an idea of the magnitudes, a household given access to remittance income located at the 10th percentile of the expenditure distribution, would spend 7 times more than a similarly-positioned household which does not receive remittances.

While this confirms the positive contribution of remittancesto poverty alleviation in Nigeria, we reach a more nuanced conclusion regarding its distributional impact: As shown in Figure 2, the quantile treatment response (QTR) function capturing the marginal effect of remittance receipts follows an approximate U-shape over the household expenditure distribution until the 89[th]quantile, whereupon it drops sharply, becoming zero at the 97th quantile. As such, while it is true that the poorest households gain the most from access to remittance income,which should reduce any summary measure of income inequality like the Gini coefficient which weighs the lowest income groups sufficiently highly;it is also true that a large mass of households below the median income level, located between the 13th and 35th quantiles, gain relatively less than more prosperous households.

Not surprisingly, the distributional impact is different if we restrict our attention to transnational remittances alone. While we still observe an approximate U-shape of the QTRfunction between the 15th and 89th quantiles of the conditional expenditure distribution, households in this interval experience considerably greater marginal impacts of remittance income than the pooresthouseholds below the 20th quantile and the richest households above the 90th quantile. We discuss the implications of this shape and its differences with the previous case in Section IV.

At the methodological level, our study is among the first to employ to apply instrumental variable quantile regression (IVQR) to investigate the impact of remittances on poverty and inequality at the household level.[3] This has the following advantages: First, any estimate of the impact of remittances on household expenditure evaluated at the conditional mean would not be representative of the entire sample since the marginal impact of remittances is almost certain to differ for households at different points of the conditional expenditure distribution. In addition, the distribution is highly positively skewed as can be seen from the kernel estimates presented in Figure 1. Quantile regression is a natural choice of method to address these concerns.

Second, it provides a more complete picture of the distributional impact of remittances than the conventional strategy of decomposing a summary measure of inequality such as the Gini coefficient (Adams & Cuecuecha, 2013; Barham & Boucher, 1998; Beyene, 2014; Rodriguez, 1998) by tracing the remittance induced change in household expenditure over the entirety of the distribution.Finally, it allows us to address the poverty and inequality impacts of remittances in a unified empirical model. We elaborate on these points in the section following the next.

2. Conceptual foundations

The need for an empirical inquiry into the distributional impact of remittances arises from the fact that the question is theoretically indeterminate. At its simplest, the distributional impact of remittances can be tied to the question of migrant selection, originally posed in

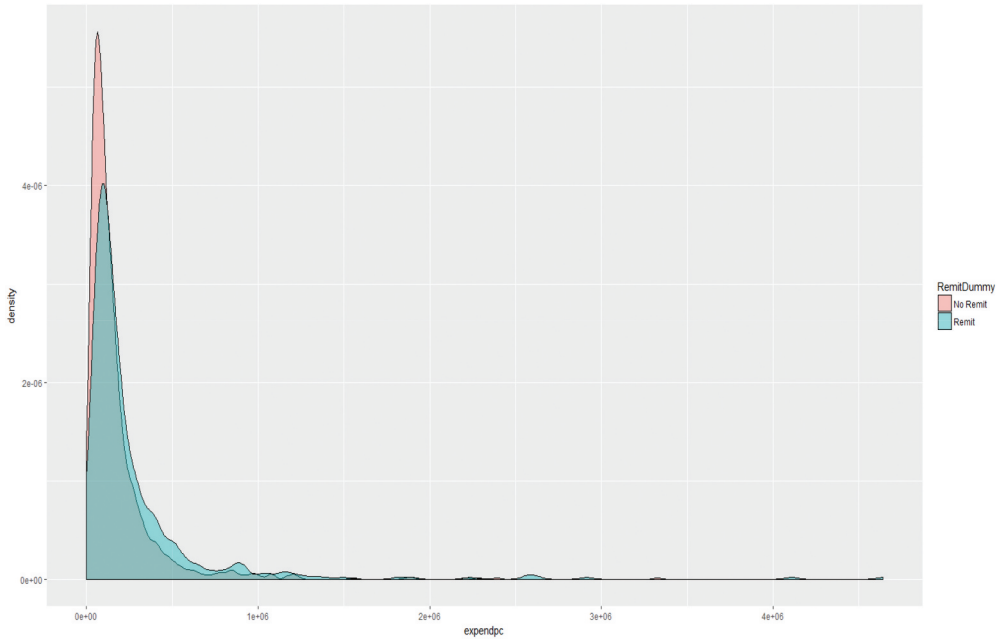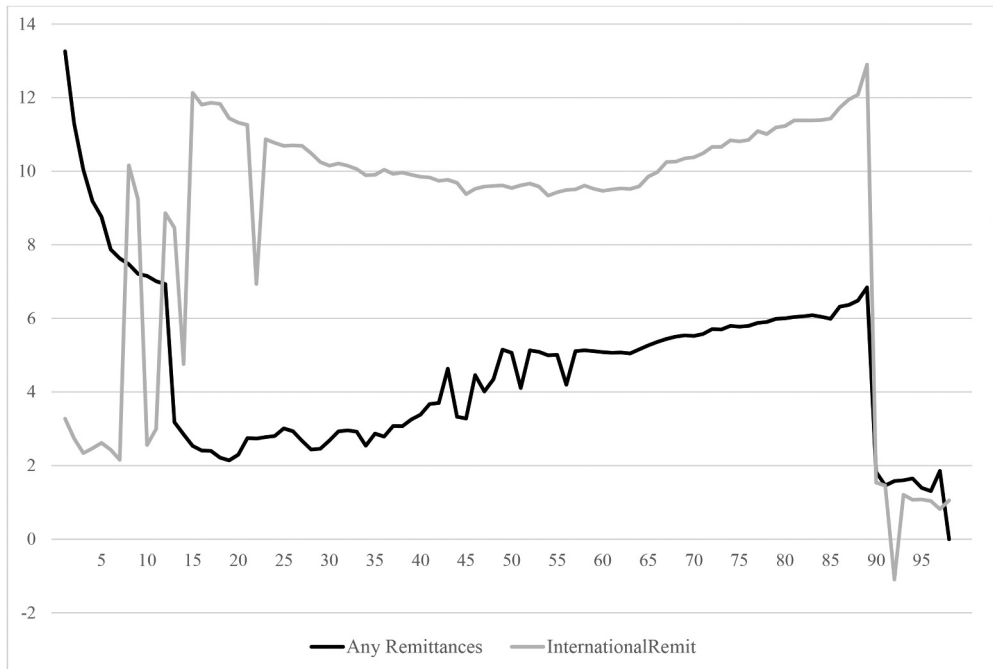**Figure 1.** Kernel estimates of the household expenditure distribution.

Figure 2. Quantile treatment response functions.

the context of the neoclassical model of migration.[4] If we believe that international migration is characterized by negative selection (Borjas, 1987), whereby relatively greater expected marginal returns from migration make the unskilled more likely to emigrate, it is

clear that remittances should reduce inequality, since the unskilled are likely to be drawn from the lower range of the domestic income distribution.On the other hand, if we accept the position that the substantial costs of migration (Chiswick, 1999) and international transfers (Freund & Spatafora, 2008) rule out the option of migrating and sending money for all but the highest skilled, then remittances should increase inequality in the country of origin.[5]

A more nuanced perspective on the distributional impact of remittances comes from the New Economics of Labour Migration(NELM), which regards migration as a household decision undertaken to insure against unanticipated negative shocks (Amuedo-Dorantes & Pozo, 2006; Stark & Lehvari, 1982) that destroy livelihoods given imperfect credit and insurance markets and the lack of liquid assets. More generally, households migrateto mitigate constraints on household income generation imposed by structural characteristics (Stark, 1982). As observed by Taylor and Wyatt (1996), the theoretical ambiguity regarding the distributional consequences of remittances arises primarily from the fact that while a poor household is necessarily subject to more binding credit, insurance, and liquidity constraints on income generation and may arguably experience a greater marginal impact of remittances if such transfers are available; the same resource constraints make it less able to defray the sizeable costs of migration as compared to the rich. As such, the net distributional impact of remittances is unclear.

The fact that remittances have both a direct effect on household income and an indirect effectthat operates by mitigating the liquidity, credit and insurance constraints on household production compounds this ambiguity; andit is theoretically unclear if the latter will indeed be greater for relatively poor households. Taylor and Wyatt (1996) point out that the indirect impact of remittances on household income depends critically on the composition of the household asset portfolio. In particular, the initial portfolio may contain essentially illiquid assetswhose ownership does not provide access to credit or insurance in itself, but which yield significant returns conditional on complementary investment.[6] Since remittances help to finance such investmentand insure against the associated risk, it follows that the indirect impact of remittances on household income should be higher for households with relatively greater holdings of such assets. The aggregate distributional impact of remittances will therefore depend on whether such assets are more likely to feature prominently in the portfolios of the rich or the poor, which is ultimately an empirical question.

Note furtherthat the presumption that remittance income would necessarily be directed towards alleviating the credit, insurance, and liquidity constraints facing the household may itself be suspect (Chami et al., 2005):If migration is indeed a strategy to diversify sources of household income to insure against negative income shocks, then the household can be regarded as a financial intermediary which, by definition, operates in an environment of asymmetric information. As such, the impact of remittances on household income is subject to moral hazard, though it has been argued that the magnitude of the problem may be less for remittances than other transfers due to relatively closer monitoring by family memberswho send money home (De & Ratha, 2012).[7]

3. A brief methodological review

Following Stark et al. (1986), first generation studies assumed remittance receipts to be an exogenous source of household income and obtained the direct impact of remittances by decomposing the Gini coefficient of the household income distribution into parts accounted for by each alternative source of income, including remittances.[8] The limitation of this method is the fact that remittances are essentially endogenous to household income, since the incentive to migrate is determined by constraints on income generation imposed by a lack of liquidity and the imperfection of credit and insurance markets, which also exacerbate the impact of unanticipated shocks (Taylor & Wyatt, 1996).

In view of this critique, the more recent literature treats remittances as endogenous, accounting for both the direct impact on household income and the indirect impact operating via the alleviation of liquidity, credit, and insurance constraints. Following Barham and Boucher (1998) and Rodriguez (1998), many studies accomplish this by constructing the counterfactual scenarioof what the Gini coefficient of the household income distribution would be in the absence of migration and comparing it to that of the factual distribution with migration. While the first generation studies do not control for selection bias in the access to migration (McKenzie & Rapoport, 2007); subsequent research does so, typically using instrumental variables (Adams & Cuecuecha, 2013; Beyene, 2014; Combes et al., 2014) or to address the problems of simultaneity, reverse causality and selection bias that plague household level inquiries on the poverty and inequality impact of remittances (Adams, 2011).

Our study follows the second body of research in explicitly addressing the endogeneity of remittances and household income with appropriate instruments and adds quantile analysis at the household level to provide a deeper understanding of the distributional impact of remittances. The IVQR technique allows us to identify the heterogeneous marginal effect of remittances over the entire conditional household expenditure distribution rather than demonstrate changes to summary measures of the distribution like the Gini coefficient. In other words, not only are we able to find out whether remittances changed the distribution but are also able to identify who gained and by how much.

4. Existing evidence on the Nigerian context

As previously noted,the evidence fromNigeriahas unambiguously revealeda positive investment impact of remittances, though the aggregate distributional impact of remittances remains theoretically indeterminate: Using a matched dataset of 112 migrant households in the United States and 61 families in Nigeria, Osili (2004) finds that on the average, a 10% increase in the income of an immigrant significantly increases the probability of the immigrant investing in housing in their home communities in Nigeria by approximately three percentage points. Interestingly, the investment is motivated as much by the direct market returns on the housing asset as by the fact that it acts as asignal of the resources possessed by the migrating member and his or her commitment to the family, which enhances the access of remaining family members to formal and informal credit and insurance marketsby reducing the perceived risk of default.

Utilizing data from the National Living Standard Survey (NLSS) of 2004, Odozi et al. (2010) compare the actual income of migrant households with the counterfactual of what

it would have been in the absence of migration and find that remittances significantly improve both poverty and inequality. Based on the same data and an alternative method for constructing the counterfactual based on propensity score matching, Chukwuone et al. (2012) confirm the significant poverty alleviation impact of remittances. Using the accumulation of consumption and durable assets as measures of poverty and treating remittances as exogenous to household income, Ajaero et al. (2018) use more recent data from the nationally representative Migration Household Survey (2009) conducted by the World Bank to find a significant positive impact of remittances on poverty.

Also based on theMigration Household Survey (2009), Ratha et al. (2011) find that the share of international remittance income used for the purpose of investment in physical assets and entrepreneurship stands at approximately 40%, with a further 27% being invested in education and health. A more recent study by Ajefu (2018) based on the same data confirms the strong positive impact of remittances on household investment, both productive and non-productive. Finally, a study by Fonta et al. (2015) based on survey data from two contiguous states from the south-eastern part of the country find that on the average about 36% of international remittance income is invested in acquiring physical capital and entrepreneurship, the share of health and educational investment again being approximately 27%.

5. Data and methods

As stated previously, our analysis is based on the nationally representative Migration Household Survey of 2009 sponsored by the World Bank.[9] The original dataset consists of 2,251 households, including 875 households with at least one international migrant, 813 with at least one internal migrant and 813 without a migrating member. We should also note that while our data offer considerable richness at the individual household level, they do not constitute a panel, and therefore do not enable us to track trends in expenditures over time.

5.1. Dependent variable

We identify the poverty and distributional impact of remittances in terms of how they affect household expenditure. Expenditures are a superior proxy for household welfare for a couple of reasons: First, there is some concern about the validity of household responses to questions about income in developing societies; second, expenditures measure consumption, which in turn measures current material well-being more accurately than income.For these reasons, the World Bank Microdata survey instrument chose to rely on questions on expenditures to assess households' material well-being, and explicitly did not include questions about income.Following Bang et al. (2016), our dependent variable is natural logarithm of the sum of per capita expenditure of the household on food (sum of the answers to items 5.23.1 and 6.12.1 in the questionnaire) and other items (sum of items 5.23.2 to 5.23.11 and 6.12.2 to 6.12.11) over the last 12 months.

5.2. Variable of interest

Consistent with the literature (Adams & Cuecuecha, 2010, 2013; Bang et al., 2016), we model the access to remittance income as an indicator variable equal to one if the

household under observation received any remittances in the last 12 months, and equal to zero if it did not. The variable is coded as 1 if at least one of the following is true: (a) the household currently has a member living outside the household (item 5.1) and the member sent money back in the last 12 months (item 5.17); and (b) the household received any money or goods from a non-household migrant member (item 6.1) in the same period.

Note that what the variable of interest captures is the marginal impact of having access to remittance income rather than the impact of receiving an additional Naira of remittances. As previously stated, the choice of this convention is necessitated by the fact that the measurement of household income in most developing countries including Nigeria is subject to considerable error. Compounding the problem, some households, especially the very poor, receive much of their 'remittance income' in the form of durable goods brought back to the family by return migrants,thoughit should be acknowledged that Nigeria exhibits a lower rate of return migration relative to most other Sub-Saharan economies.

5.3. Control variables

We control for a number of characteristics of the household and of the household head that existing studies document as affecting the impact of remittances on household expenditure, both generally and in the specific context of Nigeria (Ajaero et al., 2018). The former includes(1) the number of individuals currently living in the household (item 1.1) and (2) the location of the household as captured by an indicator variable that equalsone if the household is located in a rural area and zero otherwise.

The latter comprise (3) the age of the head of the household (item 1.4) and its square; (4) the gender of the head (item 1.3) as captured by dummy variablethat equalsone if the head is male and zero otherwise; (5) years of schooling completed by the head (item 1.10); and (6) the occupation of the head, as captured by a set of 12 dummies distinguishing between managers, professionals, technicians and associate professionals, clerical support workers, service and sales workers, agriculture, forestry and fishery workers, workers in crafts or related trades, plant and machine operators, elementary occupations, armed services, and individuals who did not answer the question (item 1.13).[10] The final sample comes to 1,846 households, with 81 households (about 4.4% of the original dataset) dropping out due to missing values. We present summary statistics for all variables in Table 1.

5.4. Estimation strategy

We estimate the impact on remittances on household expenditure using the IVQR methodology developed by Chernozhukov and Hansen (2005). Quantile regression provides a useful tool for describing treatment effects over the full distribution of observed outcomes (Koenker, 2005). However, in our case we must account for the fact that wealthier households have greater access to migration, and therefore also to remittances.[11] Since IVQR is a relatively recent entrant to the remittance literature, we provide a brief outline of the estimator, directing the reader to the original reference for a more detailed exposition.

Table 1. Summary statistics.

Variable	Mean	Std. Dev.	Min	Max
HH Annual Expenditures p.c.	201,528.800	304,272.200	1,026.67	4,639,500.00
ln(Expend. p.c.)	11.719	0.947	6.93	15.35
Received Remittances	0.302	0.459	0	1
Age	47.880	12.594	17	97
Age^2	2,450.999	1,258.691	289	9,409
Education	2.641	1.176	1	5
Household Size	6.081	3.348	1	24
Household Type				
Urban	0.472	0.499	0	1
Rural	0.528	0.499	0	1
Household Head: Gender				
Male	0.902	0.297	0	1
Female	0.098	0.297	0	1
Household Head: Occupation				
Managers	0.096	0.295	0	1
Professional	0.123	0.328	0	1
Technicians & Assoc. Prof.	0.096	0.295	0	1
Clerical & Support	0.033	0.179	0	1
Service & Sales	0.148	0.356	0	1
Agriculture, Forest, & Fishery	0.269	0.443	0	1
Craft & Related Trades	0.105	0.306	0	1
Plant & Machine Operators	0.016	0.124	0	1
Elementary Occupations	0.070	0.255	0	1
Armed Forces	0.007	0.084	0	1
Others	0.037	0.188	0	1
Household Head: Ethnicity				
Yoruba	0.256	0.437	0	1
Ibo	0.233	0.423	0	1
Efik/Ibibio	0.070	0.255	0	1
Ijaw	0.037	0.188	0	1
Nupe	0.045	0.207	0	1
Bini/Esan	0.047	0.212	0	1
Other	0.100	0.300	0	1
None Reported	0.001	0.023	0	1
Number of obs.	1,846			

Let $r \in \{0, 1\}$ be a treatment variable representing remittances, where $r = 1$ denotes household access to remittances and $r = 0$ the lack thereof. The realization of the natural log of household expenditure (Y) under the treatment r is denoted by Y_r. Note that our interest lies in comparing the distributions of Y_r conditional on the vector of exogenous household characteristics X, under the alternate treatments of receiving and not receiving remittances. To this end, denote the τ^{-th} quantile of Y_r, conditional on the treatment r and the realized values $X = x$ of the exogenous household characteristics, as $q(x, r, \tau)$.

Since Y is continuous, we can represent the realization of Y under the treatment r as

$$Y_r = q(x, r, u_r), \tag{1}$$

where $\tau \rightarrow q(x, r, \tau)$ is the conditional quantile function of Y_r and u is an unobserved random variable distributed uniformly over [0,1]. To interpret (1), note that Y_r describes the expenditure impact of receiving and not receiving remittances on a household with observed characteristics x and an unobserved or latent characteristic u, such as unreported asset holdings. In specifying (1), we are essentially allowing the impact of receiving remittances on household expenditure to vary according to the unobserved asset position of the household. Note that u may also represent the structural error term.

If r is endogenous, the standard moment restrictions

$$P[Y \leq \theta\ (r,\ X,\ \iota)\ |\ X,\ Z] = \iota, \qquad\qquad (2)$$

wouldno longer be appropriate for identifying the conditional impact of r on Y. Given appropriate assumptions (Chernozhukov & Hansen, 2005), this can be accomplished by nonlinear conditional moment restrictions of the form

$$P[Y \leq q(r,\ X,\ \iota)\ |\ X,\ Z] = \iota, \qquad\qquad (2')$$

where Z is a vector of instruments that affects r but not Y. Our implementation of the Chernozhukov and Hansen (2005) IVQR estimator follows Kwak (2010). The procedure involves three steps:The first step regresses the endogenous variable r on the vector of exogenous covariates X and the identifying instruments Z. We then use the predicted values of r to estimate the ι^{-th} quantile of Y, which we assume to be a linear function of the variables. Finally, we obtain parameter estimates that minimizethe objective functions of both stages at ι by conducting a grid search around the values estimated in step 2.

5.5. Instruments for remittances

The instruments used to control for endogeneity in the access to remittances include the absolute value of latitude and mobile phone ownership, where the latter is a dummy variable taking the value one if the household reports owning a cell phone and zero otherwise. Latitude is a distance variable that has been used extensively in the literature as an instrument for remittances (Bugamelli & Paterno, 2011) and captures the cost of moving from the less developed north to the more developed southern states or alternatively, the cost of accessing the major departure point for international travel, namely, Lagos, which is located on the Southern coast of the country.

The intuition behindmobile phone ownership is more nuanced: while mobile transfers have become a key means of transferring remittances in many economies insub-Saharan Africa, recall that Nigeria did not allow telecommunications firms to enter the banking sector until 2018. Hence, the variable does not stand for the cost of sending remittances as in the study by Bang et al. (2016) on Kenya. It is included becausethe advent of mobile technology has dramatically reducedcommunication and search costs (Aker & Mbiti, 2010) and has helped to alleviate the significant informational limitations that have typically constrainedeconomic migration.[12]

6. Empirics

Table 2 displays the results of IVQR estimation for the 10th, 25th, 50th, 75th, and 90th percentiles of the conditional distribution of the dependent variable. Controlling for endogeneity in the access to migration, households receiving remittances spend more than similar households not receiving remittances by an economically important and statistically significant margin at virtually all levels of the distribution. This underscores the crucial role of remittances as a vehicle for alleviating poverty in Nigeria, consistent with what has been observed for other sub-Saharan economies like Ghana (Adams & Cuecuecha, 2013), Ethiopia (Beyene, 2014), Kenya (Bang et al., 2016), and Senegal (Agwu et al., 2018).

Moreover, we observe the greatest impact remittances at the lowest quantiles of the conditional expenditure distribution: Note from column 1 of Table 2 that at the 10th

Table 2. Instrumental variable quantile regression results dependent variable = ln(Annual household expenditures per capita) treatment variable = received any remittances.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	0.10	0.25	0.50	0.75	0.90
Remittances	7.156***	3.011***	5.063***	5.776***	1.828***
	(1.968)	(0.719)	(1.022)	(1.298)	(0.639)
Age	−0.0330	−0.0567**	0.0538	0.00985	−0.0301
	(0.0673)	(0.0246)	(0.0350)	(0.0444)	(0.0219)
Age^2	0.000205	0.000194	−0.000837**	−0.000122	0.000318
	(0.000660)	(0.000241)	(0.000343)	(0.000436)	(0.000214)
Education	0.0684	0.0964*	0.0287	0.0794	0.134***
	(0.144)	(0.0528)	(0.0750)	(0.0953)	(0.0469)
Household Size	−0.0983**	−0.109***	−0.0625***	−0.0724**	−0.0704***
	(0.0444)	(0.0162)	(0.0231)	(0.0293)	(0.0144)
Female	−0.131	−0.610***	−1.082***	−0.244	−0.309*
	(0.539)	(0.197)	(0.280)	(0.356)	(0.175)
Rural	−0.244	−0.136	−0.224	−0.404*	−0.471***
	(0.338)	(0.124)	(0.176)	(0.223)	(0.110)
Constant	7.045***	13.27***	11.15***	12.97***	14.59***
	(1.771)	(0.648)	(0.920)	(1.169)	(0.575)
Observations	1,846	1,846	1,846	1,846	1,846

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

percentile of the expenditure distribution, householdsreceiving remittances spend about seven times more than comparable households without access to remittances.[13] The difference drops to about three-fold at the 25th percentile before rising to about five-fold at the 50th percentile and slightly less than six-fold at the 75th percentile.It then drops off to about two-fold at the 90th percentile.

Figure 2 presents a more precise idea of the expenditure impact of remittances by graphing the QTR function,which captures the proportional change in household expenditure resulting from receiving remittances for comparable households at all quantiles of the conditional expenditure distribution. Note that the impact of remittances peaks at the 1st percentile, where households receiving remittancesspend nearly fourteen times more than comparable households that did not receive remittances. The size of the impact drops sharply until the 19th percentile, where households receiving remittances spend just over twice as much as comparable households without access to remittances. The function then rises gradually until the 89th percentile, where the access to remittancesincreases household expenditure by a factor close to seven. Following this, the function again drops sharply, becoming negative at the 97th percentile.

The following observations bear emphasis in this context: First, the expenditure impact of remittances is highest for households located at or below the 12th percentile of the conditional expenditure distribution. Hence, it is clear that the access to remittances confers greater benefits to those who need it the most. Second, with the exception of the richest households lying at or above the 90th percentile, households between the 13th and 35th percentiles of the conditional expenditure distribution gain substantially less from remittances than those on either side of this interval.

As further demonstration of the distributional impact of remittances, we have simulated the Lorenz curves for remittance-receiving households and non-remittance households respectively and present the curves in Figure 3. In constructing these curves we
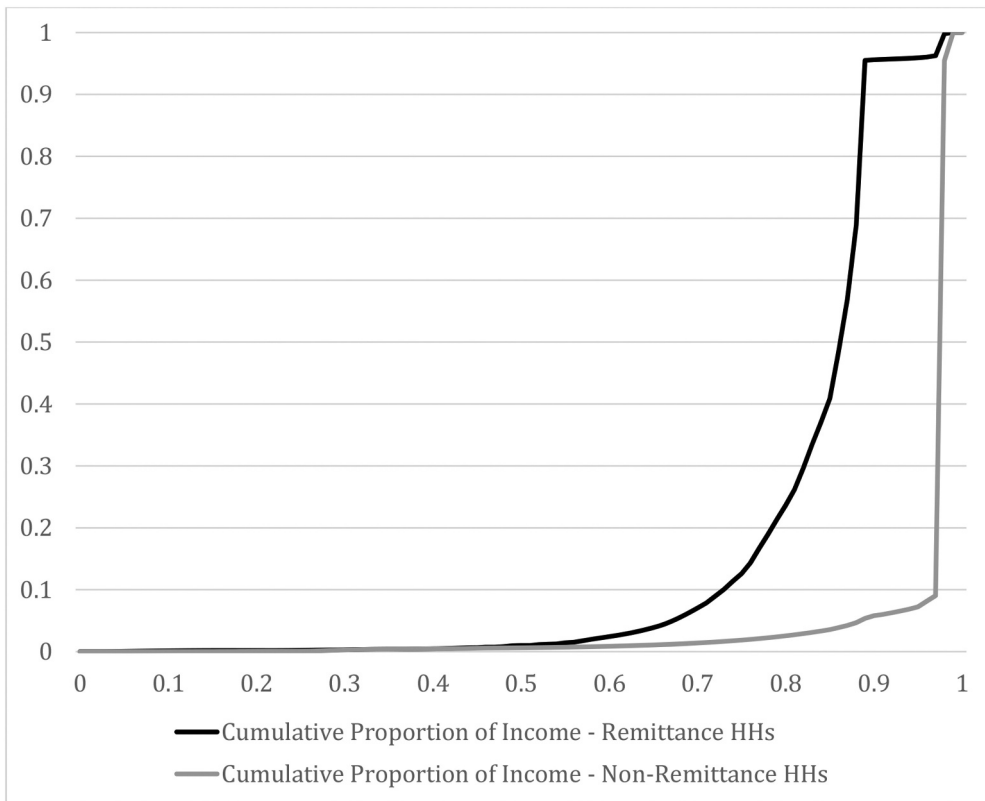
Figure 3. Lorenz curves (simulated at the mean) for remittance and non-remittance households.

have fixed the values of the other covariates at their respective means. There is no doubt that in this simulation the curve for the remittance-receiving households lies much closer to the perfect-equality 'ideal' of the 45-degree line. In particular, note that while the distributional impact of remittances is unambiguously positive, it is also true that there is a considerable mass of households located below the median expenditure level who gain less from remittances than more affluent households.

The distributional impact of remittances may also depend on whether these transfers are sent from within the country or from outside. As such, our final exercise isolates the impact of international remittances bycomparing households receiving international remittancesto those either receiving no remittances or receiving remittances from within Nigeria. The lighter line in Figure 2 represents the QTR function, derived in part from the regression results in Table 3.

While we still observe an approximate U-shape of the QTR function between the 15[th]and 89th percentiles of the conditional household expenditure distribution followed by a sharp drop at the 90th quantile, there are two key differences with the previous case: First, it is no longer true that the poorest households exhibit the greatest marginal impact of receiving remittances. Since our methodology controls for the access to migration, we cannot attribute this to the poor having limited cross-border mobility as compared to the relatively more affluent. While our data does not permit us to identify the precise reason

Table 3. Instrumental variable quantile regression results dependent variable = ln(Annual household expenditures per capita) treatment variable = household received international remittances.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	0.10	0.25	0.50	0.75	0.90
International Remittances	2.560*	10.69***	9.545***	10.81***	1.538
	(1.347)	(3.485)	(2.827)	(3.514)	(1.022)
Age	−0.00775	0.0652	0.00621	0.00938	−0.0352*
	(0.0241)	(0.0625)	(0.0507)	(0.0630)	(0.0183)
Age^2	−9.67e-05	−0.000951	−5.12e-05	−6.08e-05	0.000372*
	(0.000252)	(0.000652)	(0.000529)	(0.000658)	(0.000191)
Education	0.0205	−0.0825	0.0656	0.0725	0.120***
	(0.0575)	(0.149)	(0.121)	(0.150)	(0.0436)
Household Size	−0.0873***	−0.0507	−0.0648*	−0.0728*	−0.0736***
	(0.0162)	(0.0418)	(0.0339)	(0.0421)	(0.0123)
Female	−0.613***	−1.077**	−0.0770	−0.114	−0.136
	(0.196)	(0.507)	(0.411)	(0.511)	(0.149)
Rural	−0.126	−0.166	−0.316	−0.414	−0.515***
	(0.132)	(0.343)	(0.278)	(0.346)	(0.101)
Constant	2.560*	10.69***	9.545***	10.81***	1.538
	(1.347)	(3.485)	(2.827)	(3.514)	(1.022)
Observations	1,846	1,846	1,846	1,846	1,846

Standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

for the lower marginal impact of remittances at the lower quantiles of the household expenditure distribution, note that

Second, with the exception of the extremities of the conditional expenditure distribution located below the 15th and above the 90th percentile respectively, note that access to international remittances has a greater marginal impact on household expenditure than what we observed in the previous case. Taken together with the first observation, it is thus clear that the distributional impact of remittances is less pronounced if we focus on international remittances alone, especially if we consider the impact on the very poorest households.

7. Conclusion

Much work remains in the area of understanding the impacts of remittances. What is true in the context of Nigeria may not hold for its West African neighbors, countries in other parts of Africa, or other regions. While our results are consistent with the general optimism regarding the poverty impact of remittances in sub-Saharan economies, a key contribution of our study is to point out that the distributional impact of remittance inflows to Nigeria is more nuanced than has so far been considered in the literature. The greater expenditure impact of remittances observed for the poorest households when we do not focus on international transfers alone makes it clear that policies that increase the access to migration and reduce the cost of remittance transfers will unambiguously benefit the poorest sections of the society. At the same time, such policies may increase the gap between households lying just below the median level and households lying just above it. Policies designed to improve the governance of remittances need to consider this heterogeneity. The fact that international remittances may have qualitatively different

impacts than domestic transfers further underscores the need to consider the hetero-geneous impacts of remittances.

The greater impact of domestic remittances also carries special implications for a country like Nigeria. As the most populous country in Africa, and one with more than 250 identified ethnic distinctions and over 500 indigenous languages, facilitating internal migration and integrating internal migrants from different ethnolinguistic backgrounds presents a significant challenge, especially given that horizontal differentials between ethnic groups has been a key dimension of the inequality problem in Nigeria (Archibong, 2018). The better Nigerian policy makers can do to overcome these obstacles, the better able it will be to integrate its economy to the benefit of its poorest households.

Notes

1. From the World Bank data on Annual Remittance Inflows by Country: http://www.worldbank. org/en/topic/migrationremittancesdiasporaissues/brief/migration-remittances-data.
2. According to the World Development Indicators (https://data.worldbank.org/indicator/SI. POV.NAHC), 46 percent of Nigerians lived below the national poverty line at its last measure-ment in 2009, which also happens to coincide with the date of the survey we use.
3. To the best of our knowledge, Bang et al. (2016) is the first study to use the method to analyze household level survey data from Kenya. IVQR has since been applied by Agwu et al. (2018) to the Senegalese context. Also see Bui and Imai (2018) for an application of quantile regression to the context of internal migration in Vietnam.
4. See Massey et al. (1993) for a critical review of this and other theories of migration.
5. See Mata-Codesal (2018) in the context of Ecuador.
6. Taylor and Wyatt (1996) provide the example of nontradable *ejido* lands in Mexico which are communally owned but assigned to individual households for cultivation. While the house-hold has property rights over the agricultural output it generates from the land, it cannot sell its right to cultivate that land to others. In other words, there is a separation of ownership and control rights.
7. There is increasing evidence that migrants are cognizant of and take steps to address informal asymmetries inherent in the utilization of remittance income. De Laat (2014), for example, documents an array of monitoring mechanisms employed by internal migrants in Kenya, including random visits, insistence on project proposals for the disposal of remittance income prior to sending any money, and arranging for monitoring household expenditure by friends and family who are not part of the immediate household and can be depended upon.
8. See Wouterse (2010) for a recent contribution focusing on Burkina Faso.
9. See Plaza et al. (2011) on the methodology and main findings. The survey is available as part of the World Bank Microdata Library at http://microdata.worldbank.org/index.php/catalog/ 402.
10. This last category was created to minimize the number of observations lost due to missing data.
11. Azam and Gubert (2006), for example, describe how relatively wealthier households in Africa tend to migrate, and show how this selection might have different impacts on incentives and outcomes due to the selection problem.
12. We calculate he LM statistic for underidentification for the means regression as 18.417 with a p-value of 0.0001 to confirm the strength of our instruments; the Sargan statistic for overidentification is 3.459 with a p-value of 0.0629, which fails to reject the null hypothesis that the excluded instruments are uncorrelated with expenditures and thus confirms validity.
13. Since we have taken logs of the expenditure variable, the coefficient represents a proportional change in expenditures for a given unit change (switch from no remittances to remittances):

$$\frac{d\ln(expend.p.c.)}{dremit} = \frac{\frac{dexpendp.c.}{expendp.c.}}{dremit} = 7.156.$$

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