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Determinants of Cash Remittances: Case Study of Zambia

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Abstract
Remittances have become more and more important for development since they form an external source of finance that currently exceeds official development aid, foreign direct and portfolio investments in many developing countries. They have the potential to contribute to economic growth and poverty alleviation through increased consumption, savings and investment, that is conditional on the context of the recipient country. In Zambia, the importance of remittances is evidenced by the numerous money transfer institutions in both formal and informal sectors as well as the rapid increases in both international and local remittances. With electronic money transfer services provided by mobile telephone service providers, the domestic money transfer system has received a boost. This study analyzed the major determinants of cash remittances among households in Zambia. The study used secondary data from the Central Statistical Office of Zambia. Results from the Probit model analysis indicates that gender, age of household head ,household size, disability ,attended secondary school, occupation and distance to the market have a strong influence on whether a household will receive remittances. In particular, study results suggest the need to give the disabled an opportunity to actively participate in the main stream economic activities of the country and encouraging policies towards the development and expansion of market infrastructure.
Keywords: Determinants, Remittances and Zambia

1. Introduction

Remittances are financial resource flows, arising from the cross border movement of nationals of a country. They have become more and more important for development since they form an external source of finance that currently exceeds official development aid, foreign direct and portfolio investments in many developing countries. Remittances have a potential to contribute to economic growth and poverty alleviation through increased consumption, savings and investment, that is conditional on the context of the recipient country (Mansoor and Quileen, 2006; Ratha and Mohapatra, 2007). In most developing countries, migration (whether internal or international) has become an important livelihood strategy among households because migrant households are provided with remittances that are not correlated with agricultural income (World Bank, 2006). Over the years, the volume of remittances to developing countries has been rising significantly and it has increased on average by 16% annually since 2000, Gupta *et al.,* (2009).

In Zambia, the importance of remittances is evidenced by the numerous money transfer institutions in both formal and informal sectors as well as the rapid increases in both international and local remittances. With electronic money transfer services provided by mobile telephone service providers, the domestic money transfer system has received a boost. Besides the formal money transfers, there are also the informal channels through person to person conveyance, informal arrangements with public transporters especially bus companies among other channels. Thus this trend is likely to continue as more and more Zambians are still seeking for work and study opportunities in different locations (both national and international). According to the United Nations, in 2010, an incredible US$300 million was remitted by Zambians in the diaspora. In view of the fact that remittances, go directly to family members without any intermediaries and are available to the recipients to use them according to their own priorities, they thus have a great potential to generate a positive impact on the recipients welfare. For example, households may decide to use them to finance basic consumption, education, health, improvement of dwellings, purchase of real estate and investment in business. They may be as well be important in supporting micro-enterprises.

Thus remittances can potentially play a significant role in relief of destitution and stimulation of economic activities at local levels. In addition, they help households maintain their consumption levels through economic shocks and adversity. For developing countries, international remittances are seen to be a more constant source of income with a doubling of annual international remittances between 1988 and 1999 (Maimbo et al. 2003). Although there is good information on the ever increasing size of remittances (internal and international), there is generally lack of understanding about the determinants of cash remittances in Zambia. As far as literature is concerned and to my knowledge, no study has been conducted in Zambia on the determinants of households receiving these remittances. Thus this study attempts to contribute towards filling this gap.

The study objective is; to identify the major determinants of cash remittances among households in Zambia.

2. Methodology

2.1 Empirical Model

The approach of this paper is to analyze the determinants of cash remittances among households in Zambia, in the general framework of probability models. Most studies of qualitative nature focuses on appropriate speciation, estimation, and use of models for the probabilities of events, where in this case, the event is a household's likelihood to receive remittances. There are basically three models for binary choice. These include the Linear Probability model, the Probit and Logit models. The linear probability model has three important weaknesses: the error term may exhibit properties of heteroskedasticity, it may also possess elements of non-normality and the predicted value of the dependent variable may fall outside the unit interval, White *et al.* (1993). Jones *et al.* (1989), show that while Generalized Least Squares (GLS) may circumvent the problem of heteroskedasticity, truncating the value of the dependent variable through Logit analysis does not resolve the problem. Thus the Probit is used in this study for a number of reasons. First, it has the ability to generate bounded probability estimates for each observation. Second, the Probit estimator assumes that the underlying error term follows a normal distribution which is the same distributional assumption typically made for continues variables (Anim and Lyne,1994).

The Probit model is a special case where the probability of the i^{th} household receiving remittances or not depends on the unobservable utility index I_i, that is determined by one or more explanatory variables, in such a way that the larger the value of the index I_i, the greater the probability of a household receiving remittances. Given that $Y = 1$ if a household received remittances and $Y = 0$ if it did not, an assumption is made that there is a critical or threshold level of the index, called I_i^* such that if I_i exceeds I_i^*,the household received remittances, otherwise it did not. The threshold I_i^* like I_i is not observable, but an assumption is made that it is normally distributed with the same mean and variance. Thus given the assumption of normality, the probability that I_i^* is less than or equal to I_i is computed from the standardized normal (cumulative distribution function) CDF as

$$P_i = P(Y = 1 \mid X) = \mathrm{P}(\mathrm{I}_\mathrm{i}^* \le \mathrm{I}_\mathrm{i}) = \mathrm{P}(\mathrm{Z}_\mathrm{i} \le \beta_1 + \beta_2 X_i) = F(\beta_1 + \beta_2 X_i) \quad (1)$$

Where $P(Y = 1 \mid X)$ means the probability of the i^{th} household receiving remittances given the value(s) of the X_i explanatory variable(s) and where Z_i is the standard normal variable, i.e., $Z \sim (0, \sigma^2)$. F is the standard normal CDF written explicitly as:

$$F(I_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{I_i} e^{-z^2/2} dz = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_i + \beta_2 X_i} e^{-z^2/2} dz \quad (2)$$

As a result, the probability that the i^{th} household will receive remittances is measured by the area of the standard normal curve from $-\infty$ to I_i.

The parameters β are estimated by maximum likelihood and there are consistent, asymptotically normal and efficient. The joint log likelihood function is

$$LogL = \sum Y_i \ln F\left(\frac{X, \beta}{\beta, X}\right) + \sum (1 - Y_i) \ln\left(\frac{1 - F(X, \beta)}{\beta, X}\right) \quad (3)$$

The marginal effect of each explanatory variable on the probability of a household receiving remittance is:

$$\frac{\partial E\left(\frac{Y}{X}\right)}{\partial X} = \phi(X'\beta)\beta \quad (4)$$

The marginal effect values after the Probit regression model show the percentage change in the probability of a household receiving remittance for each unit change in the corresponding explanatory variable.

2.2 Model Specification

The general formulation of the Probit model for this study is;

$$Y_i^* = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_k X_{ki} + \varepsilon_i$$
$$\varepsilon_i \sim \mathrm{N}(0, \sigma^2)$$
$$Y_i = \begin{cases} 1 \ \ if \ \ Y_i^* > 0 \\ 0 \ \ otherwise \end{cases} \quad (5)$$

$Y_i^* =$ dependent variable, that is the probability of a household to receive remittances or not

$X_i =$ explanatory variables assumed to determine household receiving remittances.

$\beta =$ the vector of unknown parameters

$\varepsilon_i =$ is the independent normally distributed error term assumed to be normal with zero mean and constant variance.

2.3 Data Sources

This study uses secondary data from the Central Statistical Office (CSO). CSO keeps information for most of the government departments of the country and conducts various research projects and surveys. The data for this study is cross sectional and is based on the survey called '*The Living Conditions Monitoring Survey (LCMS)-2010'*. The LCMS of year 2010 is the latest survey so far. The Living Conditions Monitoring Survey is intended to highlight and monitor the living conditions of the Zambian population. The survey questionnaire contains detailed sections on remittances, demographic and socioeconomic household characteristics, household assets and household expenditure. The survey is representative at national level as it covered the entire nation, both rural and urban households since it was designed to provide data for each and every district in Zambia. A sample of 1,000 Standard Enumeration Areas (SEAs) was drawn to cover approximately 20,000 households. However, due to non-response and other challenges, usable data had 19,396 households and this is the sample size for this study.

2.4 Explanatory variables for this study

The following are expected to be the explanatory variables that determine cash remittances. The choice of these variables is based on a review of the literature on the topic and available data. Table 1 presents these variables.

Table 1.Explanatory variables for this study

Variables	Description	Expected Sign
Gender	Gender of head of household (male = 1).	±
Age	Age of household head (years).	+
HSize	Number of people in the household	+
PriEdu	Whether household head attended primary school (primary=1).	+
SecEdu	Whether household head attended secondary school (secondary =1).	+
TerEdu	Whether household head attended tertiary school (tertiary=1).	+
OccWage	Household head occupation (in wage employment=1).	-
OccBusi	Household head occupation (business person=1).	-
OccFarmer	Household head occupation (farmer=1).	-
Disability	Whether household head has a disability (disability presence=1).	+
Oxen	Oxen ownership	±
Tractor/Vehicle	Tractor/Vehicle ownership	±
Residence	Whether household head resides in rural/urban area (rural=1)	+
Distance	Distance from homestead to nearest market (km).	±

3. Econometric Results and Discussions

The results of the Probit regression analysis presented in Table 2, reveals that residence, Oxen ownership, Tractor/Vehicle ownership, primary attendance and tertiary attendance by the household head are not a significant determinant of cash remittances among households. On the other hand, for all significant

determinants, both positive and negative relationships are observed.

Table 2. Determinants of cash remittances (dependent variable: received cash remittances or not)

Variables	$\partial y / \partial x$	*Robust Std. Err.*	*Coef.*
Gender (male = 1)	-0.1030	0.0405	-0.3160***
Age of household head (in years)	0.0034	0.0008	0.0114***
Household size	0.0068	0.0043	-0.0228***
Disability presence (yes=1)	0.0420	0.0457	0.1354**
Education level (base = "illiterate")			
Attended primary (yes=1)	0.0027	0.0296	0.0090
Attended secondary (yes=1)	0.0229	0.0248	0.0762**
Attended tertiary (yes =1)	-0.0123	0.0330	-0.0418
Main occupation(base="Zero occupation")			
Salaried work (yes=1)	-0.0949	0.0310	-0.3304***
Business (yes=1)	-0.0188	0.0293	-0.0642**
Farming (yes=1)	-0.0300	0.0325	-0.1018**
Assets			
Oxen ownership (yes=1)	0.2214	0.1656	3.7538
Tractor/Vehicle ownership (yes=1)	-0.7780	0.4841	-3.7113
Residence (rural=1)	-0.0073	0.0274	-0.0245
Distance to the nearest market (km)	-0.0005	0.0005	-0.0016**
Constant	0.0000	0.4584	-0.6917
Number of observations	19396		
Wald chi2(14)	1176.03		
Prob > chi2	0.0000		
Pseudo R2	0.0306		
Log likelihood	-10074.408		

Note: Significance level: ($p \leq 0.01$)***; ($p \leq 0.05$) ** ;($p \leq 0.10$)*

Gender of the household head significantly and negatively determines cash remittances. From the results, being a male household head decreases the probability of receiving remittances by 10%, *ceteris paribus*. The findings are in line with those of Kiiru (2010) who reported that gender is a determinant of cash remittances.

The variable sign for Age of household head is positive, a priori and is significant at 1%. The results indicate that, a 1% increase in the age of a household head will increase the probability of a household head to receive cash remittances by 0.3%, *ceteris paribus.* This is so because age is a function of prudent financial management and/or frugality, in that elder household heads are better financial managers than younger household heads. Also, the study results concur with findings from Kenya by Kiiru (2010) in which a positive relationship between age of household head and remittances was reported.

Household size is significant at 1% and its coefficient has a positive sign. This therefore means that there is a direct relationship between household size and cash remittances. If household size is increased by 1%, it increases the probability of a household head to receive remittances by 0.7 %, *ceteris paribus.* Thus the results suggest that households with larger sizes will receive remittances in order to meet the basic necessities of life such as food, shelter and clothing than households with smaller sizes. This concurs with findings by Kiiru (2010) in which a positive relationship between household size and remittances was reported.

The study results indicate that disability significantly determines the probability of a household head to receive remittances and that the probability of a household head who is disabled to receive remittances is 4.2% higher than for a household head who is not. According to Kachaka (2011), this is so because disabled people are still discriminated against and excluded from the main stream economic activities. Also, they have a lot of challenges and are not able to live a sustainable livelihood as most of them depend on begging for a livelihood and the money realised from begging does not meet all their basic needs.

There exist a positive relationship between receiving remittances and attended secondary school. Thus the result entails that household heads who attended secondary school, their probability of receiving remittances is 2.3% higher than for those who did not.

With respect to the occupation dummy variables, salaried work is significant at 1% while, business and farming are both significant at 5% level of significance. In all cases, their coefficients are negative thus implying a relationship that is negative, between occupation and remittances. Thus the probability of household heads with

salaried work, are in business and in farming, to receive remittances is 9.5%,1.9% and 3% lower than those households without an occupation (zero occupation). This is so because those household heads with an occupation are in the main stream of economic activities and are able to live a sustainable livelihood. However, the results are in contrast to that of Piracha *et. al.* (2013) who reported a positive relationship.

The variable distance to the market is significant at 5% and its coefficient has a negative sign. This therefore means that there is an indirect relationship between distance to the market and remittances. If distance to the market is increased by 1%, the probability of a household head to receive remittances is reduced by 0.1%, *ceteris paribus.* Since distance to the market is an indicator of access to markets and organized trade as well as proximity to economic resources (Sichoongwe, 2014 and Kankwamba *et al*., 2012), the results entails that household heads located close to the nearest market will receive remittances. Thus the nearer to the market the household heads are, the easier it becomes for them to receiver remittances through the nearest markets which have financial institutions such as commercial banks and post office.

4. Conclusion and Recommendations

The study was conducted with the objective of identifying the major determinants of remittances among households in Zambia. The research study presents evidence that factors like gender, age of household head, disability, attended secondary school, occupation and distance to the market significantly determines the probability of receiving cash remittances among households. Based on the findings, the study recommends that the disabled should not be discriminated against; they should be given an opportunity to actively participate in the main stream economic activities of the country so as for them to live a sustainable livelihood that will enable them to meet their basic needs. After all, disability is not inability. Also, policies towards the development and expansion of market infrastructure should be encouraged by the government and other stake holders since the nearer to the market the households are, the more likely and the easier it becomes for them to receive remittances. Market infrastructure is key for organized trade, proximity to economic resources and market access.

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