Analysing the Effect of Remittances on Rural Household in Pakistan

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By

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Abstract

Rural households are more vulnerable to uncertain situations, for these uncertainty they diversify not only their resources but their income. Income receive to households is in three formats i.e. labour income, internal remittance income and external remittance income. Rural households invest for uncertain situation in future, rural households invest in assets in good time and this investment help them to tackle future uncertainty. Current paper investigates by using the data of PSLM that how remittances effect accumulation of assets, because remittances are utilise as transitory income. Results also explains that external remittances significantly affect the assets accumulation of rural households.

Key Words: Assets Accumulation, Rural Areas, Probit Model, PSLM, Pakistan

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1.   Introduction

Assets are an important part of household's investment. Household invest in different ways for their maximum satisfaction and try to invest in safe zone where risk is minimum. Household invest in small business and in education, health etc. but assets e.g. land, agricultural land, shops, and animals and poultry are also important for household because it help them to generate not only income and satisfaction but save them from future uncertain situation. Income receive to household are mostly used for day to day consumption so any income other than labour income e.g. gift, bounces from their current job or any type of income which they receive for certain time, treat as transitory income and theories of consumption proved that these income are used more for saving than consumption or used for investing purposes then consumption.

Investing is an important area of households to maintain their current status and future also. Most of household which cannot maintain their flow investment so they devote their saved part of income in stock investment. Important example of stock investment for rural household is assets, for investing in assets households need income and they diversify their resources to generate the maximum income, member of household which work at origin or at home town and generate income we call it labour income. Sometime members of household do not get opportunities of earning income at origin so they search a place where they can produce higher income. If they got better opportunity of work to earn higher income in foreign country or outside the home town, so they move some of member to earn higher income. The income generated by those member will be named as internal remittances and external remittances.

Developing countries cannot ignore the importance of remittances for their development, remittances is taking important place in their development. It is a type of

income which help these countries to improve their BOP, increase their reserves, maintain exchange rate (ER) and improve the welfare and living standard of people of their country. These remittances help them at micro level i.e. household level, to improve health condition of their family members, education of their family member, infant mortality and improve the

Income help the household to fulfil their necessities, and households which receive remittances will treat them as transitory income. Theory of income says that marginal propensity to invest from transitory income is higher than permanent income, so we can say that those households which receive remittances use them more for investing purposes. At micro level these remittances help the household to improve their health of family, increasing the education of their children, enjoy more durables and luxurious life.

Pakistan is developing country and it became 7th largest nation in term of receiving remittances in 2015. It covers more than 6% of its GDP from these remittances (World Bank, 2015). Many organizations and economists gave different reasons of fluent increase of remittances to Pakistan some are, that due to Pakistan Remittance Initiative (PRI), inflow of money is increase through formal channel then informal channels, now those worker which are leaving the country are skilled and educated so their earning in foreign is greater and last but not the least and important is whiting the black money (Amjad et al., 2012). Some important countries which have major role in Pakistan remittances are Gulf Countries Council (GCC), United States (UK) and United Kingdom (UK).

As the remittances inflow has increased more than $17 billion. These play visible part in economy of Pakistan, which it cover huge part of its debt from these remittances, cover government expenditures and most important is playing a role of poverty reducing.

The aim of this paper is to analyse the importance of remittances for rural household that how the treat remittances income, how the improve their livelihood through investing in assets. Rural household invest in both in human and physical assets but physical assets is our area of interest in this paper that whether remittance income really influence their assets or not. To understand that how rural household accumulate assets in twelve months so variable was taken as binary. As we have binary choice response dependent variable so probit model is chosen and for estimation we used maximum likelihood method. If household found their assets in better condition than last year so value "1" is given and "0" otherwise. This study is tried to capture that how household use their income especially remittance income in assets holding.

The remaining parts of paper contain literature review, methodology for estimation, results and discussion.

2.   Literature review

We see different studies and literature which shows the importance of remittances and how it influence the assets of households. Lucus and Stark (1985), Ledesma and Piracha (2004) Osili (2004), found that remittances are used for investment by rural household. These studies found that household invest in different ways and for different reasons i.e. for inheritance, for saving their future and to keep their dignity at origin. Those households which receive remittances have better living standard and most of remittances receiving household invest them in housing and health and education were the results found by Adam et al. (2010), Yang (2011), Adam and Cuecuecha (2013) in their studies. Gilani et al. (1981) conducted the survey which was first migration survey in any developing country and survey shows different important figures. Some important results were that remittance were used for real estates, consumer durables, health and

education. People also invest in productive purposes i.e. purchase of livestock, improving their farms, and purchasing inputs and machinery for agriculture. External remittance play significant role in non-farm assets in Pakistani rural areas was the conclusion of study conducted by Adam (1996) and Adam (1998) measured investment of rural households of Pakistan and found that remittance do not influence each and every type of physical assets of rural household but still have positive impact of external remittances on accumulation of most of assets.

Siddiqui (2013), Awan and Javad (2015) concluded that those households which receive remittances enjoy more durables and enjoy higher living standard then those which do not receive remittances.

Not only income of household have impact on assets but some household characteristics also have important role in accumulation of assets. Chitiji and Staford (1999), Schmidt and Sevak (2006), Vicki L. Bogan (2014), Adam (1996), Adam (1998) found that household characteristics also play important role in accumulation of assets for households. Household characteristics that gender of household head, dependency ratio on head, and number of children are the main and important characteristics.

3. Methodology

For estimation and finding the effect of remittances (internal and external) we have to choose the proper model through which we could estimate the proper equation and find results. We have dependent variable in "0" and "1" so we choose probit model. Functional form of model is;

$$\mathbf{A_i = f\ (Y_i,\ IR_i,\ XR_i,\ M_i,\ HHMU15_i,\ HHMO15_i,\ AgeHH_i,\ EDU_i,\ DG_i,\ \mu_i)} \qquad \mathbf{3.\ 1}$$

Whereas;

A_i = Household Assets Accumulation (Measure as binary variable such as; 1= Assets Accumulation during the year and 0= Assets Not Accumulated the during year)

Y_i = Labour Income in Rupees

IR_i = Internal Remittances in Rupees

XR_i = External Remittances in Rupees

M_i = Number of Males over 15 Years of Age

$HHMU15_i$ = Household Member under 15 years of Age

$HHMO15_i$ = Household Member over 15 years of Age

$AgeHH_i$ = Age of Household Head

EDU_i = Education of Household Head

DG_i = Gender of Household Head (Measures as binary variable such as; 1= Male Household Head and 0= female Household Head)

$\mu_i = Error\ term$ $\mu_i \sim N(0, \sigma^2)$

As our dependent variable is binary (as 0, and 1) and so probability model will be formed. We can write probability function and equation with our variables as follows;

$$Probability(A_i = 1 | y_i, XR_i, IR_i, M_i, HHMO15_i, HHMU15_i, AgeHH_i, EDU_i, DG_i)$$

We can generate our Probit Model

$$A_i = \begin{cases} 1 & if\ household\ accumulate\ asset \\ 0 & otherwise \end{cases}$$

We are also using positive accumulation of assets, all those rural households which attain assets in last twelve months, if rural household have assets in more than one form we will give them value"1".

$$prob(A_i = 1) = prob(A_i^* > 0)$$
$$= prob(x_i\beta + \mu_i > 0)$$
$$= prob(\mu_i > -x_i\beta)$$
$$= \left(\frac{\mu_i}{\sigma} > -x_i\frac{\beta}{\sigma}\right)$$

$$prob(A_i = 1) = prob\left(\frac{\mu_i}{\sigma} > -x_i\frac{\beta}{\sigma}\right)$$

As Probit model has symmetric distribution so we can write as;

$$= prob\left(\frac{\mu_i}{\sigma} > x_i\frac{\beta}{\sigma}\right)$$

$$= \Phi\left(x_i\frac{\beta}{\sigma}\right) \quad \text{[3]}$$

Now we have following model for our study;

$$A_i = \beta_0 + \beta_1 y_i + \beta_2 IR_i + \beta_3 XR_i + \beta_4 M_i + \beta_5 HHMU15_i + \beta_6 HHMO15_i \quad \textbf{3.2}$$

$$+\beta_7 AgeHH_i + \beta_8 AgeHH^2{}_i + \beta_9 edu_i + \beta_{10} DG_i + \mu_i$$

Where; $\mu_i \sim N(0,\sigma^2)$

Dependent variable is binary will show whether ith rural household accumulate assets or not. "β_0" is constant term whereas the other "β"s are coefficients of independent variables will show association with assets.

Probit model will be estimated through maximum likelihood. Goodness of fit of model will be checked through pseudo R^2. We can define pseudo R square as it compares the value of likelihood of estimated model to the value of likelihood when none of independent variable is included as predictor. Log likelihood will be used to check the significance of estimated model. Using chi square test, with assumption that all coefficients except intercept are zero, to check at which degree our model is significant.

4.   Results and Discussion

For this study we used Pakistan`s most representative survey, Pakistan Social and Living Standard (PSLM), 2012-13 has been taken. This survey consists of 75516 household of Pakistan out of which 48918 are rural household and 26598 urban household. We will do our analysis on rural households. This survey contain detail

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[3] Johnston, J. and J. DiNardo (1997).

information about health, education, assets of household, employment, population welfare and sanitation of water. Data is collected at districts and provisional level. As our focus is differentiated three type of income i.e. labour income, internal remittance and external remittances so find the impact of each type of income. This survey has separate questions for internal remittances receiving and external remittances receiving. It is founded that 3036 rural household receive external remittances, and 5186 receive internal remittances. Labour income, internal remittances and external remittances are measured in PK rupees. For this study those household which receive both type of remittance (internal and external) are counted in external remittance recipient household.

Table 1: Summary Statistics of Variables

Variable	Obs	Mean	Std. Dev.
Gender of Head	48918	.9196819	.2717878
Age of Head	48918	45.27231	13.22349
Member Under 15years	48918	3.021567	2.154291
Member Over 15years	48918	3.633509	1.877635
Male Over 15years	48918	1.888732	1.219961
Education of Head	48918	1.257697	.8709887
Internal Remittances	48918	12075.08	52128.95
External Remittances	48918	13666.31	70129.75
Labour Income	48918	171988.9	245489.3
Assets Accumulation	48918	.2266037	.4186383

Table 1 shows the summary stats of variables we see that annual labour income to rural household is Rs.171988 and if we look at external and internal remittances receive to households (including all household) we got to know that Rs.13666 and Rs.12075 are

external and internal received remittances respectively. Average values of other variables i.e. household characteristics are also given in table below;

Rural households which receive external remittances and accumulate assets in last twelve months 657 which are more than 21 percent of those household which receive remittances. Remaining household shows zero value which means they do not accumulate assets or if they accumulate assets so their assets condition is not better than previous year. Those household which receive internal remittances and accumulate assets in last twelve months are 1112 household which are more than 21 per cent of those household which receive internal remittances. As we are measuring assets as binary variable so those household which response in zero means condition of their assets is worse than last year.

If we look at the education of household head we see that most of households head are illiterate. More than 50 % of female head and almost 50% of male head are illiterate and there are less than 1 per cent of heads which are highly educated. If we calculate education level this through our ranking we see that there are 30% head which are primary educated.[4]

Table 2: Cross Tabulation of Education and Gender of Head

Gender of person * Education Cross tabulation										
			Education							Total
			0	1	2	3	4	5	6	
Gender of person	female	Count	2185	1116	488	91	39	5	5	3929
		% within Gender of person	55.6%	28.4%	12.4%	2.3%	1.0%	0.1%	0.1%	100.0%
	Male	Count	22099	14192	6958	1149	429	73	89	44989
		% within Gender of person	49.1%	31.5%	15.5%	2.6%	1.0%	0.2%	0.2%	100.0%
Total		Count	24284	15308	7446	1240	468	78	94	48918
		% within Gender of person	49.6%	31.3%	15.2%	2.5%	1.0%	0.2%	0.2%	100.0%

[4] Education is ranked as; 0=illiterate, 1=primary, 2=middle, 3=metric, 4=grade12, 5=grade14, 6=higher education
*Different diplomas and technical education/diplomas are also considered according to their levels

After estimating the Probit model for household of Pakistan, now we have estimated the Probit model for effect of Remittances on Rural household of Pakistan using the data set of PSLM (2012-13) by Maximum Likelihood Method. The following table 3 is showing the estimated model;

Table 3: Analysis of Remittances on Rural Household of Pakistan

Variables	Coefficients	z-stat	Marginal coefficients
Income	-1.57E-08	-0.63	-4.68E-09
External Remittances	0.000000208	2.29**	0.000000062
Internal Remittances	-0.00000015	-1.08	-4.48E-08
Gender of head	0.1913416	6.96***	0.0535854
Age	0.0136822	4.76***	0.004088
Age^2	-0.0001079	-3.73***	-0.0000322
Education	-0.0218287	-2.8***	-0.006522
Number of males over 15 years	0.0180011	1.86*	0.0053784
Household member under 15 years	0.0230627	7.75***	0.0068907
Household member over 15 years	0.0514939	8.20***	0.0153855
Intercept	-1.577551	-21.85***	
Diagnostic Test			
Log Likelihood	-25820.941		
$\chi^2_{(11)}$ test for joint significance	711.49***		
Pseudo R^2	0.0136		
N	48913		

Note: *** 1% , ** 5% and *10% level of significance

Pseudo R^2 is used for goodness of fit for estimated model. For significance of estimated equation, Log likelihood Ratio is used, having hypothesis that all coefficients of independent variables except intercept are zero. χ^2 value indicates significance of estimated model at 5% level.

Most of the explanatory variables of the model which includes external remittances, gender of household head, age and age square of head education, male over 15 years, member under and over 15 years are found to have significant impact on assets at 10 percent level, whereas insignificance of income and internal remittances indicates no effect on assets.

Signs of coefficients of explanatory variables are according to *a priori expectations* except income of household, internal remittances and education. Household income and internal remittances have negative sign for rural areas which is against *a priori* expectations but along with this their z-statistics are also insignificant so have no meanings.

External remittances have significantly positive impact on assets that increase in external remittances will increases that probability of assets by 0.0000000620 or increase chances of assets at 0.0000620 percent. Gender of Household head have significant marginal coefficient 0.053585 which means that rural household having the male head will increase the probability of assets by 0.053585 or 5.358 percent chances are there when household have male head so it hold assets.

Age of household head of rural areas have significant positive coefficient. Marginal coefficient of age is 0.004088 that is, probability of assets of household increases 0.004088 or 0.4088% chances there with age of household head to have assets. Age square of head have significantly negative effect on rural household. Marginal coefficient shows that assets will reduce by 0.0000322 probability or 0.00322% chances which is following the life cycle hypothesis theory.

Education in rural areas have significantly negative effect on assets. Marginal coefficient for education is -0.006552 shows that household assets probability is

decreasing by 0.006552 or there are 0.6552 percent chances that if rural household head have more education its assets holding will be reduced. The reason behind the negative effect of education is that more educated household in rural areas in Pakistan are having different preferences than holding assets. More than 48% of household heads are illiterate and 28 percent are primary so they have value 0 and 1 in this data which is more than 70% observation so the effect of education is almost eliminated.

Male in rural households have significantly positive effect on assets. Marginal coefficient is 0.0053784 that shows if household have male over 15 years of have significantly increase the probability of rural household to hold assets having 0.0053784 probability or 0.53784 percent chance to hold assets. Household having member under and over 15 years have significantly affect the probability of assets by 0.0068907 and 0.0153855 respectively. Or there are 0.689% and 1.538% increase in chances to effect the assets by member of household under and over fifteen years of age respectively. Dorantes and Pozo (2014) found positive effect of children, and size of household. Adam and Cuecuecha (2013) found positive effect on consumer durables and negative effect on housing and secondary education have positive effect on investing in housing. Age of head, education and children have positive effect on assets accumulation (Schmidt and Sevak, 2006)

5.   Conclusions

Rural household had external remittance income as significant for assets accumulation because they treat external remittances as transitory income which help them to secure themselves from future insecurity. Household characteristic impact is different on rural household of Pakistan in accumulation of assets. Rural Household's assets accumulation is significantly affected by external remittances. Internal remittances

also have positive impact on holding of assets but that effects is not significant. Other household characteristics like income, gender of head, age of head and dependence on household are significant. Importance of external remittances could not be ignore for household of Pakistan which stand 7th in world in respect of receiving remittances. Receiving of remittances from international migrants help rural household to accumulate assets for their future. Some other characteristics of household play significant role in assets accumulation. Rural household are more vulnerable to risks and uncertain situations so they take external remittances as transitory income and invest more in assets than other two types of income sources. Other two types of income i.e. labour income and internal remittances are mostly consume in day to day transactions. We can conclude that remittances especially the external remittances are having significant importance for rural household of Pakistan.

References

Adams, R. H. (1996). "Remittances, inequality and asset accumulation: the case of rural Pakistan." *IFPRI-4, D. O'Connor: 149-170.*

Adams Jr, R. H. (1998). Remittances, investment, and rural asset accumulation in Pakistan. *Economic Development and Cultural Change, 47(1), 155-173.*

Adams, R. H. and A. Cuecuecha (2010). "Remittances, household expenditure and investment in Guatemala." *World Development 38(11): 1626-1641.*

Adams, R. H. and A. Cuecuecha (2013). "The impact of remittances on investment and poverty in Ghana." *World Development 50: 24-40.*

Amuedo-Dorantes, C. and S. Pozo (2014). "Remittance income uncertainty and assets accumulation." *IZA Journal of labor and development. 3:3.*

Awan, M. S., et al. (2015). "Migration, Remittances, and Household Welfare: Evidence from Pakistan." *The Lahore Journal of Economics Volume 20 (1): 47–69*

Bliss, C. I. (1934). The method of probits. *Science, 79(2037), 38-39.*

Bogan, V. L. (2014). "Household Asset Allocation, Offspring Education, and the Sandwich Generation." *Offspring Education, and the Sandwich Generation (October 10, 2014).*

Chiteji, N. S. and F. P. Stafford (1999). "Portfolio choices of parents and their children as young adults: Asset accumulation by African-American families." *American Economic Review: 377-380.*

Fisher, R. A. (1922). On the mathematical foundations of theoretical statistics. *Philosophical Transactions of the Royal Society of London. Series A, Containing Papers of a Mathematical or Physical Character*, *222*, 309-368.

Gilani, I., et al. (1981). Labour Migration from Pakistan to the Middle East and Its Impact on the Domestic Economy. Part 1. *Pakistan Institute of Development Economics, Islamabad. (Research Report Series 126.).*

Gilani, I., et al. (1982). "Labour migration from Pakistan to the Middle East and its impact on the domestic economy: part III (sample design & field-work)." *Working Papers & Research Reports: RR No. 128.*

Government of Pakistan, Federal Bureau of Statistics: *Pakistan Social and Living Standards Measurement Survey (PSLM) 2012–13. Islamabad* 2015.

James, T. (1980). Asset Accumulation and Economic Activity, Chicago, *The University of Chicago Press.*

Johnston, J. and J. DiNardo (1997). Econometric methods, Cambridge Univ Press.

León-Ledesma, M. and M. Piracha (2004). "International migration and the role of remittances in Eastern Europe." *International Migration 42(4): 65-83.*

Lucas, R. E. and O. Stark (1985). "Motivations to remit: Evidence from Botswana." *The Journal of Political Economy: 901-918.*

Osili, U. O. (2004). "Migrants and housing investments: Theory and evidence from Nigeria*." *Economic development and cultural change 52(4): 821-849.*

Ratha, D. (2003), Worker's Remittances: An Important and Stable Source of External Finance in World Bank, Global Development Finance: Striving for Stability in Development Finance, *World Bank, Washington, DC, pp. 157-75*

Ratha, D. (2005). "Workers' remittances: an important and stable source of external development finance." *World Bank Publications.*

Ratha, D., et al. (2015). Migration and Remittances: Recent Developments and Outlook-Special Topic: Financing for Development. *Migration and Development Brief*, *24*

Schmidt, L. and P. Sevak (2006). "Gender, marriage, and asset accumulation in the United States." *Feminist Economics 12(1-2): 139-166.*

Siddiqui, R. (2013). "Impact Evaluation of Remittances for Pakistan: Propensity Score Matching Approach." *The Pakistan Development Review 52(1): 17-44.*

Ul Haq, R., et al. (2014) Out-migration in Rural Pakistan: Does Household Poverty Status Matter?. *Unpublished paper Pakistan Institute of Development Economics.*

Yang, D. (2011). "Migrant remittances." *The Journal of Economic Perspectives 25(3): 129-151.*

World Bank. (2015). Migration and Development Brief, 24. *Washington, D.C*