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STATISTICAL EVALUATION, MEASURING AND MANAGING POVERTY IN RURAL PAKISTAN

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ABSTRACT

Poverty remains an essential global issue, despite the global and domestic initiatives undertaken by governments and international agencies. Pakistan, being a developing country, has been facing the severity of poverty. In an attempt to alleviate poverty in Pakistan, financial resources are provided by microfinance institutions to poor and vulnerable people. In this paper, we use logit model to study to get insight of the available data. Logit regression model indicates that zakat institution have significance contribution in poverty reduction while Benazir income support program has non-significance contribution. However, Pakistan Bait-ul-Mal has shown positive impact in poverty reduction with particular reference to working male member.

KEY WORD

Poverty, parametric, Non parametric, Logistic Regression, Pakistan Baitul Maal.

1. INTRODUCTION

Application of appropriate statistical techniques has substantial importance in obtaining insight from observed data. This paper focuses on comparative evaluation of parametric and non-parametric techniques with particular reference to their application to the data obtained from beneficiaries and non-beneficiaries of different poverty reduction programmes. Consequently providing and managing financial resources for the poor, in particular, in the form of microfinance has been considered as an effective tool for economic development and poverty reduction [Morduch and Haley (2002); Khandker (2003); Weiss and Montgomery (2005)]. This requires a well-established financial management strategy, which is very important and is considered one of the most critical activities for the poverty reduction. It is a fact that the availability of finance is the basic requirement to any household for his economic development, earning activities and poverty reduction. [See also Vos and Sánchez (2010); UN Report (1997); Sharma et al. (2000); Shah and Butt (2011) and Santos (2011)].

An important part of poverty reduction strategy is the development of human capital stock through education and skill. Education and skill requires sufficient amount of managing access to finance. Numerous studies have shown that enhancing human capital through education and training increases output and income of household. According to Harbison and Charles (1964), there are many empirical evidences that combine human capital with higher performance and sustainable competitive advantage. [See Santos

(2011); Mincer (1997); McKee and Todd (2011); Kumaria and Singh (2009); Kaas and Zink (2007); Jones and Schneider (2006); Horrell et al. (2001); Chakraborty and Das (2005) and Behrman (2011)].

It is important to state that reducing poverty need to formulate a systematic approach to identify the cause of poverty and to implement the policy about the pro-poor programs adopted by different institutions. Studies provide evidence that institution building is closely related with the exchange of resources where socio-economic and political associations interlock to create varying patterns of implementation network and intervention packages [(Gustafson (1994); Brinkerhoff and Goldsmith (1992); Ahmed (1993)]. A first step in building wide-ranging institutions is to ensure that they are effective for poverty reduction and agent of all parts of society. These institutions should be held responsible for all deprived and poor persons of the society for poverty reduction.

A peculiar feature of poverty in Pakistan is its asymmetric distribution both across provinces and within each province. As the province of Punjab is concerned, its Southern and Western areas have been seriously affected. There are great differences between the indicators of welfare among the different regions of the Punjab. Rural area of the Punjab is poorer as compared to urban area. In Punjab, household of its southern and western region have faced higher poverty level and worse human development indicators. This area is facing lack of educational and public services delivery outcome (Cheema et al. 2008). DG Khan Division, which is located in the southern Punjab, has been identified as the poorest division of the Punjab province. To evidence this, Ali et al. (2010) identified that 82% poor live in rural areas of DG Khan Division. [See also Aref (2011); Aref et al. (2011); Chaudhry (2006); Hashmi et al. (2008)].

The Government of Pakistan (2012) has since long been executing various strategies that directly or indirectly target to reduce poverty. The government indirect strategies are mostly covered through its macro-economic policy framework that aims at to ensure higher employment, enhance income and sustain growth, and more specifically, such programs include the poverty related expenditures like Peoples Works Programs, Improving Governance, Rural Development, Market Access and Community Services, *etc*. The government's direct strategies to reduce poverty include programs that emphasize allocation of increased financial resources to underprivileged population with the aim of increasing their access to physical inputs needed for higher output and enhanced human capital, as well.

It should be noted that such programs have been in operation since long, but their impact in terms of poverty reduction in the country is still uncertain. The prime aim of the study is to evaluate the efficiency of the poverty-reduction programs operated in Southern Punjab, Pakistan in the sense as to whether they contribute to the reduction of poverty in a sustainable and consistent manner.

This study measures the efficiency of these institutions individually special with the objective of identifying the right segment by applying the two different type of statistical techniques. It should, therefore, be noted that this is the first study at micro level which measures the impact of financing and managing poverty reduction institution through contributing to determinants for poverty reduction. This study will contribute in filling the information gap by comparative investigation of the economic impact of these

programs at household level by targeting the determinant for poverty reduction. The study is likely to generate useful implications for policy formulation and decision making in respect of poverty reduction strategy by contributing to existing body of literature and form a basis for further research.

2. LITERATURE REVIEW

The focus of our research paper is the application of the parametric and nonparametric statistical techniques to measure the socio economic and cultural determinants of poverty. It also compares the impact of different poverty reduction programmers for contributing on persistent basis in the rural country. Comparative empirical studies to measure the poverty reduction are lacking in the literature.

As stated above, poverty is not a simple phenomenon, and therefore it is very difficult to adopt a specific approach to address it, as it is interlocked with complex socio-economic and demographic factors. Different statistical techniques have been adopted over time to measure the poverty in different countries. The following literature review focuses in techniques aimed at measuring the impact of managing and alleviating poverty.

The existing body of knowledge indicates that a number of studies have been conducted to measure the socio-economic and demographic factors using the logit model which among others include: Leon (1998), Amin et al. (2003), Chatterjee (2001), UN Report (1997), Cheston and Khun (2000), Sharma et al. (2000), Weiss and Montgomery (2005), Hamdani and Naeem (2012), Shah and Butt (2011), Ayuub (2013), Faux and Ntembe (2013), Awan et al. (2011). Aref (2011), Janjua and Kamal (2010), Kiani (2010), Awan et al. (2011), Chaudhry (2006), Chaudhry et al. (2009), Hashmi et al. (2008), Rose and Dyer (2008). On the other hand, different researchers used the different non parametric techniques to measure the determinant of poverty [Vos and Sanchez (2010), Minoiu and Dhongde (2011), Baye (2004), Ginther (2000) etc.]. Although different studies used different methods but literature lack the comparison of two techniques at the same cross sectional data.

3. RESEARCH METHODOLOGY

This research is constructed within *qualitative research methodology*, as it aims to respond to the research questions through the perceptions, understanding, and opinions of the participants. In doing so, it collected primary data in the form of quantitative method through questionnaire from South Punjab districts. The data was collected using stratified random sampling. The sample consists of 1000 households including 500 beneficiaries and 500 non beneficiaries of poverty reduction programmers. The data were subjected to statistical analysis.

3.1 Binary Logistic Regression

Binary Logistic Regression is used to predict the occurrence of socio-economic and demographic impact. In this study, the dependent variable is dichotomous while the predictor variables are categorical and continuous variables. The logit model has been used for the analysis of the data. In logit or binary logistic is used. The logistic model is widely used and has many desirable properties (McCullagh and Nelder 1989).

The binary logistic model is

$$P(y=1/X=x)=F(\beta X)$$

where X is a matrix of explanatory variables, β is vector of parameters & F(.) is regarded as the c.d.f of logistic distribution. The logit transformation is $Logit(p)=\ln(p/(1-p))$ where p is the probability of presence of characteristics of interest.

The Logit transformation is

$$Logit(p)=\ln(p/(1-p))=\beta_0+\beta_1X_1i+\beta_2X_2i+\beta_3X_3i....\beta_kX_{ki},\quad i=1,2,\ldots,n,$$

where

p = Poverty Status (probability of being poor)
X_1 = Districts
X_2 = Beneficiaries
X_3 = Institutions i.e. Bait-ul-Mal, Zakat and Benazir Income Support Program
X_4 = Training
X_5 = Gender
X_6 = Employment & status
X_7 = Education
X_8 = Marital status
X_9 = Age
X_{10} = Total household members
X_{11} = Child dependency
X_{12} = Old dependency
X_{13} = Working female member
X_{14} = Working male member
X_{15} = Value of animals
X_{16} = Own land
X_{17} = Cultivated land
X_{18} = Business assets
X_{19} = Water
X_{20} = Change in income
X_{21} = Source of change
X_{22} = mount change
X_{23} = Saving
X_{24} = Loan

To evaluate the effectiveness of institutions, stepwise forward conditional method is also used in the binary logistic regression.

4. RESULTS, CONCLUSION & DISCUSSION

To summarize the results presented in parametric technique, Table 1 provides further detailed descriptions of the sub-variables in each of the control variable categories. This helps to establish a trend in terms of the control variables in the sense of which control

variables have the highest determining role for managing the poverty reduction in study area and in rural Pakistan as well.

4.1 Logistic Regression

In logistic regression, which is called logit model, poverty status is used as dichotomous variable which represents whether a household is poor or non-poor. This variable is regressed on set of explanatory variables the results of binary logistic model are shown in Table 1. The objective of study is to determine the impact of different covariates on probability of being poor.

Table 1
Logit Model Regression Analysis

Variables in the Equation	B	S.E.	Wald	df	Sig.	Exp(B)
Beneficiaries	4.635*	1.402	10.926	1	.001	103.056
Institutions	-.769**	.312	6.100	1	.014	.463
Training	-1.553	1.160	1.792	1	.181	.212
Gender	-1.515**	.575	6.951	1	.008	.220
Employment Status	-1.571**	.332	22.370	1	.000	.208
Education	-.630**	.114	30.323	1	.000	.533
Marital status	.956	.492	3.781	1	.052	2.601
Age	-.509*	.208	5.965	1	.015	.601
Total H.H Members	1.334**	.181	54.377	1	.000	3.795
Child Dep	.005	.211	.000	1	.982	1.005
Old Dep	.477	.280	2.909	1	.088	1.611
Working Members Females	-1.709**	.525	10.587	1	.001	.181
Working Members Males	-1.343**	.221	36.932	1	.000	.261
Value of Animals	.041	.064	.409	1	.522	1.042
Own Land	-.470	.437	1.158	1	.282	.625
Cultivated Land 1	.125	.449	.077	1	.781	1.133
Business Assets	.184	.098	3.536	1	.060	1.202
Water	.235	.157	2.229	1	.135	1.265
Change in Income	-.598**	.207	8.316	1	.004	.550
Source of Change	-.243	.128	3.573	1	.059	.785
Change Amount	.075	.071	1.095	1	.295	1.078
Saving For Emergency	-.039	.836	.002	1	.963	.962
Loan	-.075	.237	.099	1	.753	.928
Constant	1.815	.941	3.720	1	.054	6.142

The positive values of the regression coefficients show higher the value higher is chance of being poor. The negative values show higher the value lower the chance of being poor. Beneficiaries are used as dummy variable indicating 0 for non-beneficiaries and 1 for beneficiaries. Empirical results are consistent with theoretical considerations. A household who became beneficiary has more chances of being poor as compared to non-beneficiaries at the time of commencement of program and after the program beneficiaries have become non-poor. The institution has significant impact on the probability of being poor. The odd of being poor is reduced by 54% for the household who is beneficiary of zakat institution as compare to non-beneficiaries. The other institutions like Bait-ul-Mal, and Benazir Income Support Program also reduce the odd of being poor. The result show substantial difference among the institutions. Consequently, suggesting that management of the institution has important role in poverty reduction programms. The odd of being poor is reduced by 78% for a male household. Though the impact of training is statistically insignificant but sign of coefficient suggest that it helps to reduce the poverty. The odd of being poor is reduced by 80% for the household engaged in employment and same impact is found in educated household. The covariate age reduce the probability of being poor which is consisting with the theoretical consideration and size of family plays a significant role and size of family is directly proportionate of being poor. Working members of family significantly reduced the poverty. The results have provided empirical evidence to suggest that financing and managing poverty reduction institutions and other demographic factors have significant impact on poverty reduction factors. The results have suggested that parametric approach is the most plausible method to apply in financing and managing for poverty reduction.

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