

Do SMEs really contribute towards poverty reduction? An empirical analysis to explore the impact of Washing Machine sector on the poverty status of its employees in Gujranwala district

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Abstract: Poverty is a multifaceted phenomenon relying on a number of different social, economic and demographic aspects. An understanding to the true perspective of nature, intensity, and causes of poverty can be considered as a prerequisite for effectual course of action to reduce poverty. The present study attempts to investigate the impact of various socioeconomic and demographic determinants on the poverty status of 517 employees of 322 washing machine producing units operating in Gujranwala District. To estimate the probabilities of being poor, an econometric approach of logistic regression analysis with maximum likelihood estimation has been employed. The factors of household size and persons per room are found to be significantly and positively correlated with the probability of being poor. While skill level of the employee, gender of household head, average household educational points, physical assets, agricultural income housing ownership, availability of medical facilities, nature of housing structure, sources of drinking water, nature of sanitation system used, availability of sui gas, gross primary school enrollment rate, satisfaction regarding present job along with participation rate are found to be negatively and significantly associated with the probability of being poor. SMEs are also found to have a negative impact on the probability of being poor, adding positively to the argument that SMEs in this case are really contributing to enhance the living standard of its workers.

Keywords: Poverty, Washing machine producing Units, SMEs, Gujranwala.

JEL Classification: I30, O13, D63

1. Introduction

Poverty is considered as denial of opportunities and a continuous state of deprivation about basic necessities of life. Poverty and inequality are strongly interlinked, and recently, there appears to be a gradual increase in inequality both at international and national levels. According to United

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Nations Development Program, about 80 percent of the world's population resides in countries with increasing income inequality. Moreover, the share of poorest 40 percent of the world's population in global income is about 5 percent, while richest 20 percent account for 75 percent of world income.

The problem of mass poverty has been a major challenging factor against the pace of development in Pakistan since its independence. The number of the destitute has increased with the passage of time, expressing the immensity of this problem. Lack of food, shelter, health and educational facilities, unemployment, uncertainty, powerlessness, unhygienic living conditions, lack of representation and freedom are considered to be the major determinants of poverty. Majority of people in Pakistan, particularly in rural areas and also in so called urban areas, are characterized by most of the factors responsible for poverty described above, representing the dismal situation of socioeconomic and demographic indicators. According to the World Bank and the United Nations Development Program (UNDP), the poverty rate in Pakistan ranges in between 25.7 percent and 28.3 percent in contrast to the government's estimates of 23.9 percent¹ (World Bank, 2006). The failure of official planning and the market economy in lessening this problem emphasize the implication of some new and effective policy measure. The protection of the rights of the vulnerable segment of the society and participation of whole population are considered somewhat essential for long run economic development of Pakistan.

The subject of poverty is not considered as a new one in development economics. Significant work has been done to address the issue of poverty along with its consequent impact on economic and social aspects of both developed and developing countries. Considerable research has been conducted in Pakistan to analyze different dimensions and extent of poverty². The present study is an attempt to explain and investigate the determinants of poverty among the workers of light engineering sector in Gujranwala.

¹ World bank (2006)

² Naseem, 1973; Alluadin 1975; Mujahid, 1978; Irfan and Amjad , 1984; Malik,1991; Zaida, 1992 etc.

The major aspect of economic development model of Pakistan has always been the maximization of output growth, with little emphasis on the issues of widespread poverty, socioeconomic differentials, and inauspicious demographic issues. In spite of high rates of economic growth along with steady improvement in major macroeconomic indicators, it has failed to trickle down to the Pakistan's poor. Pakistan has experienced economic stagnation and poverty in 1950s, increasing growth and poverty in the 1960s, stagnant growth along with declining poverty in the 1970s, increasing growth and declining poverty in the 1980s and, declining growth with increasing poverty [MHCHD/UNDP (1999)]³. The head count ratio of poor was found to be 30.6 percent in 1998-99, with a high rise of 34.5 percent in 2000-01, and a gradual decline up to 23.9 percent and 22.3 percent in 2004-05 and 2005-06 respectively⁴.

From a worldwide perspective, SMEs are recognized as engine of economic growth⁵ because of their dependence on indigenous skills and technology, innovativeness and expansion of industrial linkages. SMEs are endogenously based enterprises as their linkages with the large multinational corporations lead to rapid growth and expansion of SMEs (Safdar & Siddiqi, 2011a). They also play a vital role in employment generation⁶ and poverty reduction⁷. In addition they contribute towards resource mobilization⁸, revenue generation through export earnings⁹, increase in savings, and equitable distribution of income, promotion of craftsmanship, egalitarian structure of society and development of an entrepreneurial culture. SMEs are also instrumental in skill acquisition through a system of informal apprenticeship and also provide training ground for upgrading and developing skills.

³ Pakistan Development Review 38 : 4 Part II (Winter 1999) page No. 859

⁴ See Government of Pakistan, Pakistan Economic Survey, 2009-2010

⁵ See Gebremariam et.al (2004), Beck et.al (2004,2005) and Tambunan (2008)

⁶ See Birch (1979), Noriyuki et.al (1998) and Osmani (2004), Safdar & Siddiqi, (2011c).

⁷ See Mukras (2003), Antonio (2003) and Liu et.al (2008), Safdar & Siddiqi, (2011b).

⁸ By organizing money market through banking sector and other financial institutions.

⁹ See Reason et.al (2004), Karadeniz et.al (2007), Nazar et.al (2008).

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The SMEs constitute more than 99 percent of businesses in Pakistan and all these activities are handled by the private sector and most of these do operate in the informal economy¹⁰. There are about 3.2 million economic establishments. In Pakistan, 99 percent of these are accorded as SMEs, according to the definition of SMEs by SMEDA. Their contribution towards value addition in manufacturing sector is 35 percent. SMEs contribute 30 percent to GDP. Their share in manufactured exports is 25 percent. They contribute 99 percent towards employment generation¹¹.

With the development and overtime growth of SMEs and their role in foreign exchange earnings, employment generation and income distribution is of paramount importance¹². According to a study conducted by Board of investment (2007), there are about 2500 registered units of Light Engineering Sector along with a much larger number of units operational in unorganized sector. Majority of these units are operating in the cities of Karachi, Lahore, Gujranwala, Gujarat and Sialkot. The study is based on the SMEs (Washing Machines Producing Units) in Gujranwala district.

Do SMEs really contribute towards poverty reduction? This is the claim made by approximately all the studies focusing on the role of SMEs along with their positive contribution towards GDP, export earnings and employment generation. They do play an important role in poverty reduction through employment generation. As in Pakistan 90% of the very small establishments accounts for 80% of all non-agricultural sector employment (FBS). That's why it is taken as a fact that SMEs really contribute towards poverty reduction. No empirical study has yet been undertaken to quantify the extent of poverty in the workers of SMEs to find out the real contribution of SMEs toward poverty reduction. This study is pioneer in its nature as no empirical study in these districts has so far been conducted to find out the determinants of poverty of the employees of a particular sector (Light Engineering Sector).

10 Refers to all economic activities that fall outside the formal economy regulated by state.

11 Economic census of Pakistan 2005.

12 *ibid*

2. Literature Review

Considerable work has been done on poverty in the case of Pakistan. The focus of most of the studies¹³ was to concentrate only counting population below the poverty line at provincial or national level, provincial level or to find out the impact of different socio-economic variables on the poverty status of the discussed population. However, a brief review of the work done with respect to different socio-economic factors is discussed below.

Household employment can be determined with the help of different indicators. Among these determinants, the rate of participation in the labor force, changes in jobs and the real rate of unemployment are mainly focused by economists (Chaudhary, 2009; Haq, 2005). The participation rate is considered to be an imperative variable relating to employment status of the household (Haq, 2005). Poor health, lower income per capita, disability, intensive religious and customs beliefs, lower status and general welfare level along with minimal asset holdings are considered as main factors for lower participation rate in LDCs (Lipton, 1983).

In the late 1990s, the stability of Gini ratio of per capita expenditure in rural areas exhibited that the growth of agricultural income helped reducing poverty in Kyrgyz Republic (Aziz-ur-Rahman, 2007). According to IFPRI data, less inequality in land ownership and less diversified agricultural income helped reducing poverty in canal colony areas of Punjab (World Bank, 2002). The present study is going to investigate the impact of presence of agricultural income on the probability of being poor.

According to literature, poverty is related to a variety of characteristics of a household such as those relating to education, demography, community, physical assets and infrastructure (Chaudhary, 2009; Jan et.al, 2008; Bruck et.al, 2007; Piachaud, 2002). Physical assets are considered as an important factor contributing significantly to per capita income. Possession of physical assets like land or livestock reduces the probability of being poor by 55 percent in rural Pakistan (Pasha and Jamal, 2001). Therefore, asset redistribution can be utilized as an efficient instrument for poverty reduction, particularly in rural Pakistan.

¹³ See Amjad and Kemal (1997); Ali and Tahir (1999); Jafri (1999); Arif et al. (2000) etc.

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The gender issue plays a vital function in poverty analysis. The significance of female-male ratio or sex ratio in a household is well established to find out their approach toward work. The severity of cultural norms is severe in rural areas as compared to urban areas suggesting that a high female-male ratio might be associated with household poverty (Chaudhary, 2009). Lower female-male ratio of workers is found to have a negative relation to depth, incidence and severity of poverty (Malik, 1996).

Large proportion of rural households in Punjab live without any drainage system with about 42 percent having open drains and 56 percent without any sanitation system (PIHS, 2001-02). Majority of poor households were found to have no sanitation system in the union council of Dhamayal (Haq, 2005). Unavailability of proper sanitation system increases the chances for poor from suffering poor health as compared to non-poor (Cheema, 2005). The study is going to employ the presence of sanitation system on the probability of being poor.

Education and training are the most important investments in human capital (Becker, 1993). Education plays a vital role in acceleration of economic growth which in turn reduces poverty. Therefore, the relationship between education and poverty requires much attention. There exists an inverse association between education of the household and poverty (Haq, 2005). Higher degree of educational attainment is associated with greater employment opportunities. Different types of indicators are usually employed to characterize education in a household living standard analysis. These involve household size, level of educational attainment, gross primary school enrollment rate and educational codes etc. (Chaudhary, et.al, 2009).

Gross primary school enrollment rate is an important indicator of educational attainment in a country like Pakistan (Chaudhary et al., 2009). Education is found to be a key determinant of living standards in Mozambique, with even one individual from a household having education beyond the primary level reduces the probability of being poor (Simler et.al, 2004). Therefore, the impact of gross primary enrollment rate should be considered as an important determinant of poverty analysis.

Shelter is referred as overall framework of personal life of the household. Three components are usually employed to evaluate shelter, by differentiating poor and non-poor households involving: services¹⁴, housing and the environment. The housing indicators comprises of building type (type of materials), the resources through which household has access to the housing facility (ownership or renting), and household equipment (Poverty Manual, 2005).

Ownership status of dwelling is considered as an important determinant of poverty as it would lower the probability of being poor¹⁵ (Arif and Bilquees, 2007). The ownership of housing unit is considered as the main factor necessary for extricating a household or individual from poverty (Chaudhary et.al, 2009). There exists a vicious cycle between acquisition of assets and poverty as ownership of dwelling or land is negatively related with both transitory and chronic poverty, implying that land-owners are mostly characterized by non-poor status (Arif and Bilquees, 2007). Ownership of house is very frequent in the rural areas of Pakistan where they live in a joint family system (Siddiqui, 2009).

Quality and type of housing unit can be considered as the result of poverty on one hand, but it also contributes to the chances of being poor in the form of unhealthy and unhygienic living conditions. It is also recognized that poor households live in more poorer and precarious sanitary conditions, which in turn add to the poorer health and thus lowering productivity of household and aggravating poverty (Chaudhary et.al., 2009). The type of housing structure in terms of nature of material used, different housing services and utilities are considered as important determinants of poverty both in rural and urban areas (Jamal, 2007). The present study has employed the impact of type of housing structure (kacha or packa) on the probability of being poor.

Access to basic amenities is considered as the major factor distinguishing

¹⁴ The focus of the service indicator involves the availability and the utilization of communications services, safe drinking water, energy sources and electricity (Poverty Manual, 2005).

¹⁵ Being an important component of shelter, it can act as security for borrowing and be sold during difficult times (Arif and Bilquees, 2007).

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poor from non-poor (Poverty manual, 2005). This proposition is also support by PIHS 2001 as about 30 percent of household fall below poverty line having access to electricity as compared to about 49 percent having no electricity (Cheema, 2005). Lacking access to infrastructure is certainly a universal problem for the poor affecting both their well-being and productivity. About 52 percent of the poor were found to live in households having electricity as compared to 76 percent of non-poor households in Pakistan (World Bank, 2002).

The housing congestion, characterized by persons per room is also incorporated in the welfare function (Jamal, 2004). A large household size increases the probability of being poor or remaining in chronic poverty. The impact of household size on poverty is well-known, poverty increases with the increase in household size (Cheema, 2005). Literature suggests that household size, number of earners and dependency ratio are high in poor households as compared to non-poor households (Gebremedhin, 2006). It is therefore assumed that the larger households are more prone to poverty exposure.

In the present study, the dependency ratio is calculated as the ratio of the number of household members below 15 and over 64 to other members of the same household. It is therefore expected that a high dependency ratio is positively correlated with the level of household poverty in context of present study.

The importance of female-male ratio or sex ratio in a household is evident from the fact that it determines the households' attitude toward work (Chaudhary, 2005). Generally, it is believed that female members of the household in Pakistan have to face cultural rigidities in order to work outside from their household, discouraging their active participation in the labor force. Thus, it suggests that a high female-male ratio increases the chances of being poor (Chaudhary et.al, 2009). The present analysis has employed the female male ratio as an important demographic variable to consider its impact on probability of being poor.

The age and gender of the household head are considered as central in

determining the attitude toward employment. It is commonly believed that the age and gender of the household head significantly influences poverty (Chaudhary et.al, 2009). Literature suggests contradictory results regarding the importance of age of household head. Age of household head is not always found to be significant in linear terms in all poverty analysis (Fissuh and Harris, 2004), while, it was found significant in case of rural areas of Cholistan in Pakistan, where increase in age of household aggravates the probability of being poor (Chaudhary, 2005; Chaudhary et.al 2009).

In developing countries like Pakistan, the women are disadvantaged as compared to men. One determinant of gender gap is either female-headed household are less economically stable as compare to those headed by male. But in contrast to the above argument, the incidence of poverty was found to be higher in households having male heads in contrast to female-headed households (PIHS, 2001). 35 percent of households below poverty were headed by males as compared to female-headed households where this percentage is about 22 percent (Cheema, 2005).

Education and training are considered as most important investments in human capital. (Becker, 1993). Education contributes positively to economic development which in turn reduces poverty. Therefore, the relationship between education and poverty requires much attention. There exists an inverse association between education of the household and poverty (Haq, 2005). The higher educated household head is more likely to attain greater incomes and thus lowering the chances to be poor. According to PIHS 2001, prevalence of poverty in illiterate household heads is about 43 percent as compared to about 24 percent in literate household-heads (Cheema, 2005). The present study has hypothesized that education of household head contributes positively to improve the living standard of household.

On the basis of the above mentioned determinants of poverty, research model presented in Fig 1 has been produced by the author for analytical purposes.

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3. Research Method

According to the World Bank (2000), “poverty is pronounced deprivation in wellbeing”. This definition leads to two different inquiries as, what is meant by well-being and against what benchmark, the extent of deprivation can be measured. According to second approach, the command of people on a specific type of consumption good is considered as well being as of food, shelter, health care or education. This approach is much broader and encompasses important social determinants which are crucial for human development in addition to food and non-food items.

The broadest approach to well-being is the one expressed by Amartya Sen (1987); according to him well-being is the result of potential to function in society. Thus, poverty is the outcome of lacking of key capabilities by people, and so having insufficient education or income, or poor physical condition, or low self-assurance, or low insecurity, or a sense of helplessness, or the absence of rights as liberty of speech.

The concept of poverty cannot be easily expressed, though; it can be defined in terms of absolute poverty as lack of resources in relation to needs and lack of resources in relation to the resources of others, i.e., relative poverty. According to the poverty theorists, the concept of absolute poverty is more related to the problems of developing countries as compared to the relative poverty. Thus, the present study has attempted to estimate and analyze absolute poverty in the workers of washing machine producing sector of Gujranwala district.

After defining poverty, it will be helpful to identify a benchmark to differentiate poor from non-poor. For this purpose, an indicator of welfare as income or consumption per capita is defined. Income defined as consumption plus change in net worth, is generally employed in developed countries as a measure of welfare, but it tends to be critically understated in developing countries like Pakistan. Consumption is less inconspicuous and can be used to measure permanent income to some extent.

The consumption per capita can be considered as most frequently utilizing measure of welfare. In order to incorporate differentiation in need by age, and economies of scale in consumption, some analysts employ consumption per adult equivalent scales. The Organization for Economic Co-operation and Development (OECD) scale¹⁶ = $(1 + 0.7 \times (NA^{17} - 1) + 0.5 \times NC^{18})$ is widely used and also employed in this study.

In Pakistan, a number of studies have been conducted during the last three decades in order to analyze the nature and extent of poverty. Most of the studies¹⁹ are primarily based on data generated through different Household Income and Expenditure Surveys (HIES), employing the calorie-intake approach to assess poverty. Whereas, a few recent studies have utilized the basic-needs approach to assess the severity of poverty.

In the present study, the official poverty line has been utilized after inflating it for the period 2008-09. Planning Commission of Pakistan has estimated the absolute poverty line of Rs. 673.54 per month per adult equivalent²⁰, by employing PIHS 1998-99 data. The Commission then adjusted the poverty line for the 2000/01 period by using Consumer Price Index as Rs. 723.40²¹ per month per adult equivalent and in 2004/05 it was estimated as Rs. 878.64 per month per adult equivalent. Amjad et.al (2008) has employed same poverty line suggested by Planning Commission by using the CPI for the period of 2007 and the adjusted poverty line was calculated as Rs. 1023 per month per adult equivalent.

The present study has inflated the poverty line developed by Planning

¹⁶ Handbook on Poverty and Inequality, Chapter No. 2, Page No. 29

¹⁷ Number of adults in the household

¹⁸ Number of children in the household

¹⁹ Naseem (1973), Irfan and Amjad (1984), Malik (1988), Amjad and Kemal (1997), Ali and Tahir (1999) and Qureshi and Arif (2001).

²⁰ Household consumption expenditures are adjusted in order to capture the differences in consumption needs with respect to age, sex and economies of scale as per adult equivalent expenditures. The adult equivalent scale suggested by OECD $(1 + 0.7 \times (NA - 1) + 0.5 \times NC)$ is being employed in the present study. Where NA is number of adults and NC is the number of children in a particular household.

²¹ Pakistan Economic Survey (2006-07) "Comparative Vulnerability Profile for 2000/01 and 2004/05"

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Commission, for the year 2008-09 and a poverty line of Rs.1398.23 per month per adult equivalent has been utilized for distinguishing poor from non-poor.

After selecting the data collection process, different indicators of poverty and an appropriate measure to differentiate poor from non-poor, the next step is to explain the analytical techniques employed to find out the probability of being poor among SME's employees in the present study. Poverty profile is the most appropriate manner in order to analyze the correlates of poverty, where household welfare across different population groups is compared with respect to different characteristics.

The FGT²² indices being the most commonly employed poverty measures are used to calculate a more detailed poverty profile of the employees of Washing machine producing sector in Gujranwala District. The most frequently utilized FGT poverty measures include the Head Count Index (P0)²³, Poverty gap index (P1)²⁴ and poverty severity index (P2)²⁵ to present a more detailed insight to different dimensions of poverty.

The present study will not only help to find out the major determinants of poverty among workers employed in washing machines producing units of Gujranwala, but will also facilitate Government to formulate policies to readdress the issue of poverty in a particular sector. It would be more appropriate to point on this stage that this study is the first one undertaken to highlight the issue of poverty among the employees of a particular sector of SMEs in Gujranwala district.

3.1 Sources of Data

²² Foster, James, J. Greer, and Eric Thorbecke. 1984. "A Class of Decomposable Poverty Measures." *Econometrica* 52 (3): 761–65.

²³ It is utilized to measure the incidence of poverty as the proportion of population living below the poverty line.

²⁴ It is employed to measure the degree to which individuals lie below the poverty line as a percentage of the poverty line.

²⁵ It can be measured by averaging the squares of the poverty gaps with respect to the poverty line.

In the present study, primary data collected through a detailed survey of the employees of Washing machine producing sector, is being utilized for analytical purposes. The survey has been conducted in the district of Gujranwala from Feb, 2009 to Feb, 2010. The format of the employee questionnaire, covering broad aspects of each employee's socioeconomic and demographic, characteristics can provide a deep insight to the causes of poverty in the employees of the Washing machines producing sector located in Gujranwala District.

3.2 Sampling design

According to a survey conducted by author, the total numbers of employees working in 322 washing machines producing units of Gujranwala were found to be 2027; applying following formula for sample selection, a sample of 517 was selected for unknown population.

$$n = \frac{NZ^2P(1-P)}{Nd^2 + Z^2P(1-P)} \quad (1)$$

where

n = sample size

N= Target Population (2027 units)

Z =Area under the Normal Curve (100 percent) i-e 3.0 approx

Guessed value of P= 0.50 or 50% percent for maximum sample size

d = Acceptable Error i.e. (6.1 percent or 0.061)

By applying the given values to eq.1:-

$$n = \frac{2027 * 3 * 3 * 0.5 * 0.5}{2027 * 0.061 * 0.061 + 3 * 3 * 0.5 * 0.5}$$

$$n = \frac{4560.75}{465.7407} = 465.74$$

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Say approximately considered sample size= 517 employees

3.3 Logistic Regression Analysis

To estimate the probabilities of being poor, logistic regression analysis with maximum likelihood estimation is employed. In the analysis dependent variable takes the value 1 when the household is not poor and 0 when household is poor. The independent variables are classified into three categories, i.e. economic characteristics of household, social characteristics of household and demographic characteristics of household. Economic characteristics of household involves household employment²⁶, household incomes in the form of per capita income, structure of household consumption expenditures, household property and assets including agricultural income and physical assets. Social characteristics of the household comprises of health²⁷, education encompassing gross primary school enrollment rate and average educational codes per household, shelter including ownership of house, type of housing structure, availability of electricity, nature of fuel used for cooking and persons per room. Demographic characteristics of household involve dependency ratio (child and old age dependency ratio), female male ratio, age, gender and education of household head.

The logistic model is defined as:

$$\log [P/(1 - P)] = \alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k = \alpha + x\beta \quad (2)$$

Here P is the probability of being poor, while $P/(1 - P)$ shows the odds ratio. α = constant and x are vector of independent variables, β are the logistic coefficients.

At times it is easier to interpret the model in terms of probabilities, i.e. odds ratios. A value of odd ratio greater than 1 indicates the increase the

²⁶ It comprises of variables like participation rate, female male ratio (workers) and level of skill of the employee working in the SME.

²⁷ It includes access to medical facilities, sources of drinking water used by the household and type of sanitation system used.

probability of being poor while less than one indicates the decrease in the probability of being poor.

Estimates of the relative odds (odd ratios) associated with a particular category of a covariate of interest can be obtained as:

$$Prob (Y = 1|x) = \frac{\exp(\alpha + x\beta)}{1 + \exp(\alpha + \beta x)} = \Lambda (\acute{x}\beta) \quad (3)$$

Where $\Lambda (\cdot)$ indicates the logistic cumulative distribution function

As equation (2) is non-linear and standard OLS technique cannot be applied, Maximum likelihood estimation has been employed in order to calculate the coefficients for each independent variable. To interpret the effect on independent variables on the probability of being poor, marginal effects of explanatory variables on dependent variable are also calculated. These marginal effects can be derived as probability derivatives which represent the instantaneous rate of change in dependent variable due to per unit change in independent variable of interest.

The marginal effects are given as:

$$\frac{\partial E [y | x]}{\partial x} = \Lambda (\acute{x}\beta) [1 - \Lambda (\acute{x}\beta)]\beta \quad (4)$$

3.3.1 Instrumental Variable Approach

Basic model employed for analytical purpose is

$$Poor = a_0 + a_1X + a_2Improvement \text{ in living standard} + e \quad (5)$$

Where

Poor = 1 (if household falls below the poverty line)

= 0 (if household does not fall below poverty line)

X = Economic, social and demographic characteristics of households along with age and gender of household head.

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Improvement in living standard means that whether the said light engineering unit is contributing to improve the living standard of its employees or not and e is the error term.

Out of the above mentioned determinants, the improvement in living standard has an endogenous relationship with poverty status. Direct estimation would lead to biased estimate of impact of washing machine sector on the poverty status of its employees. Two approaches can be used to deal with this problem (instrumental variable approach and simultaneous equation approach). While in the present study IV approach has been applied.

This approach involves those variables that are highly correlated with improvement in living standard but as compared to with poverty status. A binomial Logit model is employed to determine the impact of a set of explanatory variables on improvement in living standard due to working in the Light Engineering Unit.

$$Impl^{28} = b_1 + b_2Z + e \quad (6)$$

where

Z = Instrumental variable and it comprises of satisfaction with the job, income dependency on Light Engineering Sector, no. of years in the present job, income differential of earlier and present job, improvement in level of skill with the present job and change in consumption pattern ²⁹.

$Impl = 0$ (if improvement in living standard is negative)

$= 1$ (if improvement in living standard is positive)

The fitted values of $impl$, after the estimation of equation (6) will be incorporated in poverty equation (2) to find out the probability of being

²⁸ Improvement in living standard due to working in the Washing machines producing Unit.

²⁹ Consumption pattern involves asset accumulation comprising of total household assets and productive assets.

poor.

The impact of a particular washing machines producing unit on the improvement in the living standard of a worker can be quantified by considering different factors like satisfaction level, income dependency, working experience along with improvement in skill and change in consumption pattern. The computed values of all these explanatory variables will then be incorporated in the eq. (5) to get the impact of SMEs on poverty reduction.

4. Estimation Results

The FGT indices are being employed to measure the nature, extent and severity of poverty in the observed sample. The calculated results are being discussed in the table 4. According to Headcount Index, 40.68 percent of employees working in Washing machines producing units fall below poverty line. Poverty Gap index is being employed to measure the degree to which individuals lie below the poverty line as a percentage of the poverty line is estimated to be 0.158 in the present case. Whereas, poverty severity Index of 0.056 is being measured by averaging the squares of the poverty gaps with respect to the poverty line.

As the present study is considerably based on the primary data set collected though a survey of Washing machines producing units of Gujranwala district. A maximum likelihood Logit regression model is being employed to analyze the determinants affecting poverty status of the employees of surveyed units.

The estimated results of instrumental equation (4) yields results presented in Table (4). According to the results satisfaction with the present job has a positive impact on the improvement in the living standard. As a unit change in an satisfaction level increases the odds of improvement in the living standard by 4.358 units (the probability of improvement in living standard over the probability of not any improvement in living standard), holding all other independent variables constant. Income dependency on the Light engineering unit has a significant and negative impact on the improvement in living standard. An increase in the income dependency by one unit leads to decrease the living standard by 0.647 units. Number of years in the

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present job implies a positive and significant impact on the living standard of an employee working in the light engineering unit. Income differential between present and past job exerts a positive influence on the living standard of an employee working in the Light Engineering Unit as 1 unit increase in the income differential leads to enhance the odds of living standard by 2.408 units. Improvement in the level of skill of the employee employs a significant and positive impact on improvement in the living standard of an employee working in a Washing machine producing Unit in Gujranwala District.

The imputed values of *impl* (improvement in living standard) are then incorporated in the eq. (5) and the estimated results regarding probability of being poor are obtained.

In case of estimated results regarding Gujranwala District, the factors of household size and persons per room are found to be significantly and positively correlated with the probability of being poor. While skill level of the employee, gender of household head, average household educational points, physical assets, agricultural income housing ownership, availability of medical facilities, nature of housing structure, sources of drinking water, nature of sanitation system used, availability of sui gas, gross primary school enrollment rate, satisfaction regarding present job along with participation rate are found to be negatively and significantly associated with the probability of being poor. The variables of age and education of household head, child and old age dependency ratios, female male ratio of members along with workers and availability of electricity are proved to be insignificantly influencing the probability of being poor with correct signs representing their impact on the poverty status of households.

The skill level of the employee is found to be significant at 99 percent confidence level implying a negative impact on the probability of being poor. The coefficients involved in the logistic regression are also presented in terms of odds ratios and marginal effects. The odds ratios explain the impact of a unit change in an independent variable on the odds of being poor (the probability of being poor over the probability of being non-poor), holding all other independent variables constant.

Involvement in the skilled category of employees decreases the probability of being poor as a unit change in skill status from unskilled or semi-skilled to skilled level decreases the odds of being poor by 0.095 units. An individual, who is involved in the skilled category of workers, has expected chances of being poor which is 0.377 less than someone who is unskilled or semi-skilled. In the case of skill level of employee, the marginal effect will show the impact of being skilled on the probability of semi-skilled or unskilled, keeping the rest of the skilled labor characteristics the same as those of semi-skilled or unskilled labor.

Variables like age and education of household head are found to be insignificant in the present analysis. The gender of the household head is found to be significant at 90 percent confidence level implying a negative impact on the probability of being poor if the household head is a male.

Household size being the major demographic factor is significant at the 99 percent confidence level and exhibits a positive influence on the probability of being poor. The estimated result is being supported by the literature ³⁰ which suggests that higher household size is positively associated with poverty augmenting factors. It is generally hypothesized that more educated, healthy and adult individuals in a household adds positively to the income level of household and reduces the chances of poverty, if members of household are not educated and adult, they increases the chances of poverty. Therefore a large household size increases the chances of being poor.

Child and old age dependency ratios are found to be insignificant in the present analysis.

Education and training are the most important investments in human capital. Education plays a vital role in acceleration of economic growth which in turn reduces poverty. In the present study, the variable of average educational codes is being constructed based on the sum of the points ³¹ of a given household divided by the household size of that household. The

³⁰ See for example (Reyes, 2002), Cheema (2005), (Gebremedhin, 2006), Arif and Bilquees (2007), (Chaudhary et.al., 2009) etc.

³¹ 0 points to a household member having no education, 5 points for up to secondary level and 10 points for up to college/university education.

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estimated results suggest that education has the significant inverse relationship with the probability of being poor, implying that the higher education of household members are more likely to be associated with greater incomes and thus, having lesser chances to fall below poverty line³². It means that higher level of education in a household lowers the probability of being poor. Similarly, gross primary school enrollment rate is an important indicator of educational attainment in a country like Pakistan and is significantly proved to lessen the poverty chances of a household if the number of children registered in primary schools is high.

Female-male ratio of members as well as of workers of a household is found to be insignificant in the present context.

Overall participation rate is found to be significant in the analytical process at 99 percent confidence level. The possession of physical assets (like motor cycle, television, refrigerator, property etc.) is significantly and inversely related to the probability of being poor. Ownership of a housing unit reduces the chances of a household to fall below the poverty line³³. Agriculture as an additional source of income reduces the chances of being poor in present analysis. The factor of housing ownership is found to be negatively associated with the probability of being poor. The type of housing structure in terms of nature of material used, different housing services and utilities are considered as important determinants of poverty both in rural and urban areas³⁴. Variable of nature of housing structure is estimated as a significant variable in the analytical process employing a negative impact on the probability of being poor if a household is living in a kacha (mud) house. Access to medical facilities also diminishes the chances of being poor.

Access to basic amenities is considered as the major factor distinguishing poor from non-poor. That's why variables like access to electricity and type of fuel used for cooking purposes are also included in the present profile of

³² See Nasir (2001), Cheema (2005), Arif and Bilquees (2007).

³³ See Arif and Bilquees (2007)

³⁴ See Jamal (2007).

poverty. Results suggest the access to electricity is found to be insignificant in the present analysis and use of Sui gas as a medium of cooking fuel diminishes the chance of being poor as access to these basic amenities helps in improving the living standard and thus the productivity of a household.

The factor of persons per room is proved to be significant at 95 percent of confidence level, suggesting that an increase in congestion in residential place intensifies the chances of being poor. Differences in the sources of drinking water give vital clues about the fact that poor have limited access to the safe drinking water. Deprived access to drinking water supply and proper sanitation system consecutively increases the chances of worse health condition of poor as compared to non-poor. The theory has been supported by the empirical results as the variable of nature of drinking water is significant at 90 percent confidence level and it reduces the chances of being poor of a household if they have access to piped and safe drinking water supply.

The impact of light Engineering sector on the poverty reduction can be captured by the variable of *impl* which is calculated with the help of eq (4), and the imputed values are the incorporated in the basic Logit Model. Estimated value of *impl* is found to be significant at 99 percent confidence level implying a negative impact on the probability of being poor. According to the estimated results, a one unit change in the variable of improvement in living standard leads to change in the odds of being poor (the probability of being poor over the probability of being non-poor) by 6.14 units, holding all other independent variables constant. . Variable of improvement in living standard decreases the probability of being poor as a unit change in satisfaction regarding job decreases the odds of being poor by 0.152 units. Employees expressing positive satisfaction level towards their present job have expected chances of being poor which is 0.038 less than someone who is having less satisfaction regarding his present job status.

Thus, adding positively to the argument that SMEs are really contributing in enhancing the living standard of its employees and eventually reducing poverty.

The present analysis has been undertaken by utilizing 517 observations

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relating to Washing machines producing sector of Gujranwala. The likelihood ratio chi-square of 1697.916 with a p-value of 0.0001 tells that the estimated model as a whole fits significantly better than the empty model. The $-2 \log$ likelihood (220.141) has been employed to compare the fit of this model with Model 0. The Pseudo R-squared is considered as improvement from null model to fitted model. The R^2 is the Cox and Snell pseudo R square value which is found to be 0.076 in this case. The Pseudo R^2 represents the degree to which the parameters of the model improve the prediction of the null model. Smaller value of Pseudo R^2 represents the improvement in the fitted model.

5. Conclusion

Poverty alleviation policies have been given due considerations to eradicate poverty at all levels in Pakistan along with reasonable economic growth rate in different time periods. Poverty reduction strategy was launched by the Government of Pakistan in 2001 in response to the rising trend in poverty during 1990s. Different policies and projects undertaken by the Government regarding poverty alleviation resulted in declining the extent and severity of poverty in some areas but not in all the regions of Pakistan. It may be due to lack of micro level policies as compared to the application of macro level projects. Mega projects to eradicate poverty may result in some immediate and positive outcomes but low level projects deals with the gross root poverty and result in long term changes in the poverty structure of masses.

Development of SMEs can be considered as such a policy measure that deals with the poverty at its roots and produces results that are long lasting in its nature. It not only provides employment opportunities to the poor people but also make them productive component of the economy through informal training system, as SMEs contribute 30 percent to GDP and their share in export earnings is about 25 percent.

The present study can be considered as an attempt to understand the role of SMEs in poverty reduction. In the present study, it is attempted to analyze the different factors affecting poverty status of the employees of a particular sector using Logit Model. The main findings of this empirical analysis are

described as:

Household size and persons per room in a household are found to be strongly associated with poverty and the presence of these variables increases the probability of being poor.

Skill level of the employee, gender of household head, average household educational points, physical assets, agricultural income housing ownership, availability of medical facilities, nature of housing structure, sources of drinking water, nature of sanitation system used, availability of sui gas, gross primary school enrollment rate, satisfaction regarding present job along with participation rate are found to be negatively and significantly associated with the probability of being poor.

According to the empirical results, contribution of SMEs towards poverty reduction as a dummy variable (IMPLS) is significant at 1 percent level implying a negative impact on the probability of being poor. Thus, adding positively to the argument that SMEs in this case is really contributing to enhance the living standard of its employees.

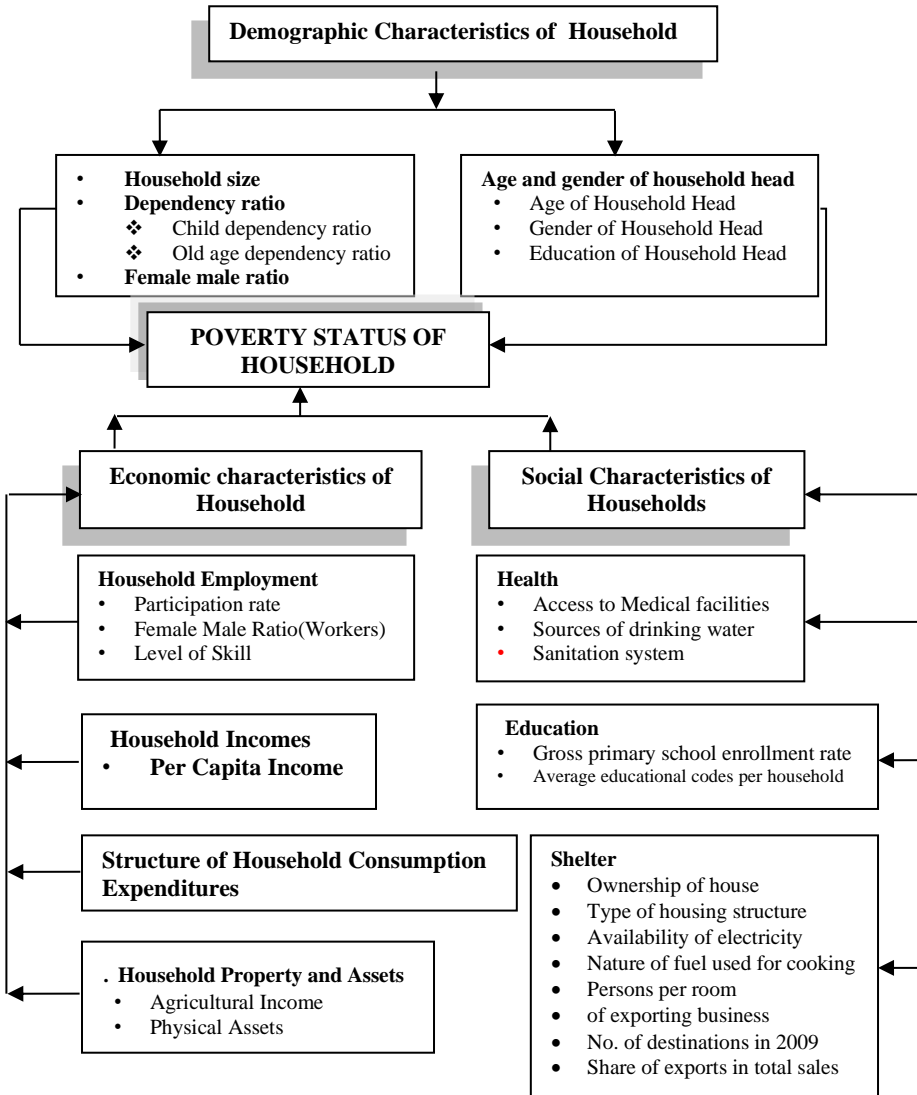
Emphasis should be given to the issues of increasing employment opportunities through establishment of small and medium enterprises, health facilities, construction of physical economic infrastructure and implementing new labor policies to improve the living standard of the above stated 80% of non-agricultural labor force working in SMEs.

Government should focus on the development of training centers that could provide basic training to the employees of the workforce of these small units. Financial assistance along with access to global markets can exert positive impact on the development of these industrial units and thus on the poverty reduction.

Government should give attention to basic infrastructure, availability of facilities like electricity, Sui gas, safe drinking water and good governance besides some other socio-economic and demographic variables to alleviate poverty.

Annexure

Fig: 1 Research Model: Poverty Profile of Household



Source: Author (2011)

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Table 1: List of the Variables Used For Logistic Estimation of Poverty Determinants

Variables	Variables Description
Dependent Variable	
POV	0= if the household is poor, 1 =Non poor
Explanatory Variables	
AGEH	Age of Household Head (years)
EDUH	Education of Household Head (0= Illiterate, 1= Literate)
SEXH	Sex of Household Head (1=male, 2=female)
HSIZE	Household Size
FMRM	Female male ratio (Members)
FMRW	Female male ratio (Workers)
PARR	Participation Rate
EDUC	Average Educational codes per household member
HOWN	Ownership of Housing Unit (0=not own, 1=own)
HSTR	Structure of Housing unit (0=Kacha,1=packa)
PHYAS	Physical assets (0=no physical assets, 1=has physical assets)
MEDFC	Access to medical facilities (0=no access, 1=has access)
PER/R	Persons per room
WAT	Drinking water facility (1=piped drinking water, 2=through hand 0=otherwise)
ELEC	Access to electricity (0=no access,1=has access)
CFUEL	Nature of fuel used for cooking (1=sui gas/wood, 0=otherwise)
GPENR	Gross primary school enrollment rate
IMPLS	Improvement in the living standard due to present job
SKILL	Level of Skill of the respondent (1=unskilled, 2=semi-skilled, 3= skilled)

Table 2: List of the Variables Used for Binomial Logistic Estimation of Improvement in Living Standard due to present job

Variables	Variables Description
Dependent Variable	
IMPL	(0= improvement in living standard is negative,1= improvement in living standard is positive)
Explanatory Variables	
SATS	Satisfaction with the present job (0=not satisfied,1=satisfied)
IDEP	Income dependency on Light Engineering Sector (percentage share)
YEARS	No. of years in the present job
YDIFF	Income differential of earlier and present job (Percentage Change)
IMPLS	Improvement in level of skill with the present job (Yes=1,No= 0)
CONSP	Change in consumption pattern (Improvement=1,not improved=0)

Table 3: Poverty Indices Based on Calculated Poverty Line

Source: Calculated from the SME survey by author, 2010

District	Headcount Index	Poverty Gap	Poverty Index
	$P_0 = \frac{N_P}{N} \times 100$	$P_1 = \frac{1}{N} \sum_{i=1}^N \frac{G_i}{z} \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z} \right)^2$	
Washing Machines	40.68	0.158	0.056

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Table 4: Results of the Instrument Variable Equation

PREDICTORS	COEFFICIENT	ODD RATIOS
SATS	1.472**	4.358
IDEF	-0.436*	0.647
YEARS	1.256**	3.511
YDIFF	0.879*	2.408
IMPLS	1.492**	4.45
CONSP	0.734*	2.08
CONSTANT	-4.81	-
Log likelihood=-763.45		Pseudo R ² = 0.232
No. of observations=517		
LR Chi ² (6)=136.33		
Prob.>chi ² =0.000		

*** indicates that coefficients are significant at 1 percent level

**indicates that coefficients are significant at 5 percent level

* indicates that coefficients are significant at 10 percent level

Table 5: Estimated results of Logit model

Gujranwala	B	Odd ratios	Marginal effects
Skill	-2.352***	0.095	-0.377
HHH age	0.013	1.013	0.006
HHH edu	-0.056	0.946	-0.011
HHH gender	-1.069*	0.343	-0.043
HH size	1.518***	4.563	0.265
Child depratio	35.445	2.47+e15	0.109
Old depratio	26.150	2.27+e11	0.024
FM ratio	0.082	1.085	0.036
Average hh points	-1.829***	0.161	-0.183
Agri income	-2.774***	0.062	-0.196
Physical assets	-3.208***	0.040	-0.105
Housing ownership	-1.405***	0.245	-0.087
Medical facilities	-1.024**	0.359	-0.024
Housing structure	-0.914**	0.401	-0.028
Persons per room	0.521**	1.684	0.134
Drinking water	-0.489*	0.613	-0.059
Sanitation	-0.30**	0.970	-0.042
Electricity	-0.517	0.596	-0.021
Cooking fuel	-0.705***	0.494	-0.030
Enrollment rate	-0.044***	0.957	-0.115
Job reduced poverty	-1.885***	0.152	-0.038
Work	-0.528	0.590	-0.009
Participation rate	-2.525***	0.080	-0.038
Constant	-45.097***	-	-

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Log Likelihood= 220.141	Pseudo
R-Squared = 0.076	
LR Chi ² (23)=1697.916	
No. of Observations=517	
Prob. > Chi ² =0.000	

*** Indicates that the coefficients are significant at the 1 percent level.

** Indicates that the coefficients are significant at the 5 percent level.

* Indicates that the coefficients are significant at the 10 percent level.

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