poverty

Poverty estimation

Poverty

- Poverty is "pronounced deprivation in well-being."
- The conventional view links well-being primarily to command over commodities, so the poor are those who do not have enough income or consumption to put them above some adequate minimum threshold.
- This view sees poverty largely in monetary terms.

Poverty

- Poverty may also be tied to a specific type of consumption; for example, people could be house poor or food poor or health poor.

- These dimensions of poverty often can be measured directly, for instance, by measuring malnutrition or literacy.

Poverty

- The broadest approach to well-being (and poverty) focuses on the capability of the individual to function in society.

- Poor people often lack key capabilities; they may have inadequate income or education, or be in poor health, or feel powerless, or lack political freedoms.

Why Measure Poverty?

- It takes time, energy, and money to measure poverty, since it can only be done properly by gathering survey data directly from households.

- Why, then, do we need to go to the trouble of measuring poverty? At least four good reasons come to mind.

Why Measure Poverty?

❑There are four reasons to measure poverty:

➢ •To keep poor people on the agenda

➢ • To be able to identify poor people and so to be able to target appropriate interventions

➢ • To monitor and evaluate projects and policy interventions geared to poor people

➢ • To evaluate the effectiveness of institutions whose goal is to help poor people.

1-Keeping Poor People on the Agenda

- Perhaps the strongest justification is that provided by Ravallion (1998), who argues,
- "[A] credible measure of poverty can be a powerful instrument for focusing the attention of policy makers on the living conditions of the poor."
- Put another way, it is easy to ignore the poor if they are statistically invisible.
- The measurement of poverty is necessary if it is to appear on the political and economic agenda.

2-Targeting Domestic and Worldwide Interventions

- A second reason for measuring poverty is to target interventions.

- Clearly, one can-not help poor people without knowing who they are.

- This is the purpose of a poverty profile, which sets out the major facts on poverty (and, typically, inequality),

2-Targeting Domestic and Worldwide Interventions

- and then examines the pattern of poverty to see how it varies by geography (for example, by region, urban/rural, mountain/plain), by community characteristics (for example, in communities with and without a school), and by household characteristics (for example, by education of household head, by size of household).

2-Targeting Domestic and Worldwide Interventions

- Probably the most important operational use of the poverty profile is to support efforts to target development resources toward poorer areas.

- However, which regions should command priority in targeting?

- This question can only be answered at a highly aggregate level by most survey data (like the Socio-Economic Survey of Cambodia (SESC) of 1993–94 or the Cambodia Socio-Economic Survey (CSES) of 1999) because of the limited number of geographic domains that are typically sampled.

2-Targeting Domestic and Worldwide Interventions

- A good poverty profile also makes employment targeting possible.

- The ability of the vast majority of households in Cambodia to escape poverty will depend on their earnings from employment.

- The highest poverty rate was found among people living in households headed by farmers (46 percent in 1993–94 in Cambodia).

2-Targeting Domestic and Worldwide Interventions

- By contrast, households headed by someone working in the government are least likely to be poor; in these occupations the poverty rate was 20 percent (1993–94).

- This would suggest that policies that aim to reduce poverty through enhancing income-generating capabilities should be targeted toward the agricultural sector.

2-Targeting Domestic and Worldwide Interventions

- The relationship between poverty and education is particularly important because of the key role played by education in raising economic growth and reducing poverty.

- The better educated have higher incomes and thus are much less likely to be poor.

- Cambodians living in households with an uneducated household head are more likely to be poor, with a poverty rate of 47 percent in 1993–94.

Continue…

- With higher levels of education, the likelihood of being poor falls considerably.

- Raising education attainment is clearly a high priority to improve living standards and reduce poverty.

2-Targeting Domestic and Worldwide Interventions

- The relationship between gender and poverty may also indicate another targeting strategy for poverty reduction.

- In Cambodia, about 25 percent of the population lives in households headed by women.

2-Targeting Domestic and Worldwide Interventions

- Perhaps surprisingly, the CSES 1999 data show that

- the poverty rate was slight lower among female-headed households (48 percent) than among male-headed households (52 percent).

2-Targeting Domestic and Worldwide Interventions

- Targeting is also important at a worldwide level. Institutions, including the World Bank and aid agencies, have limited resources, and would like to know how best to deploy those resources to combat poverty.

- For this, they need to know where in the world poor people are located, and this in turn requires viable information on poverty in every country.

2-Targeting Domestic and Worldwide Interventions

- All developed countries, and about two-thirds of developing countries, have undertaken nationally representative household surveys to collect information on consumption and/or income; in many cases, these surveys have been repeated over time.

3-Monitoring and Evaluating Projects and Policy Interventions

- More generally, the third reason for measuring poverty is to be able to predict the effects of, and then evaluate, policies and programs designed to help poor people.

- Policies that look good on paper—new opportunities for microcredit for the poor, for instance—may in practice not work as well as expected.

3-Monitoring and Evaluating Projects and Policy Interventions

- To judge the effects, one would ideally like to monitor the effects of a policy on poor people and evaluate the outcomes in comparison with a control group.

- Rigorous analysis of this kind is needed both to improve the design of projects and programs and to weed out ones that are not working.

4-Evaluating the Effectiveness of Institutions

- The fourth reason for measuring poverty is to help evaluate institutions.

- One cannot tell if a government is doing a good job of combating poverty unless there is solid information on poverty. This does not only apply to governments.

4-Evaluating the Effectiveness of Institutions

- "Our dream is a world free of poverty," writes World Bank and its first mission statement is "to fight poverty with passion and professionalism for lasting results."

- The institution's success in pursuing this goal can only be judged if there are adequate measures of poverty.

4-Evaluating the Effectiveness of Institutions

- When evaluating projects, policies, and instruments, our concern is with poverty comparisons, Ravallion (1992)

Estimation of poverty line

- **(FOOD ENERGY INTAKE (FEI)APPROACH, COST OF BASIC NEEDS (CBN) APPROACH AND CALORIE INTAKE (CI) APPROACH)**
- **Poverty line**
- In(Y) =a+ b* X +e
- Where
- Y=per adult equivalent consumption expenditure per month (food + non food)
- X=per adult equivalent calorie intake per day.
- Now this study thinks it is necessary to explain the above mentioned model.
- Firstly, this study throws light on why consumption expenditure was taken as a welfare indicator and how the per adult equivalent expenditure(Y) is estimated.

1 Consumption Expenditure As A Welfare Indicator

- The consumption and income are, generally considered two best candidates for the indicator of welfare.
- The consumption expenditure was taken as an indicator of welfare for the following reasons.
- i- consumption is considered a more direct indicator of achievement and fulfillment of basic needs.
- ii-consumption is more easily observable and measurable than income especially in developing countries.
- iii- according to life cycle theory, individuals want to smooth their consumption during their low and high income years through borrowing and saving. So consumption is considered smoother than income.

2 Selection of Items to be Included in the Consumption Aggregate

- Consumption expenditures on all items consumed regardless of whether they were purchased or produced by own or got as assistance or gifts were added up to calculate monthly expenditure.

- Expenditures on fines, property and house taxes were not included.

3 Adjustment of Household Consumption Expenditure

- Household expenditure is given in the household income and expenditure survey.

- Different households differ in size and composition. One household may include more adult male members and the other may include more female members while still the other household may include more children.

- To find the welfare at the level of individual, it is essential to adjust the consumption expenditure of the household according to the composition and size of the household.

3 Adjustment of Household Consumption Expenditure

- Following World Bank (2002) and FBS (2001) this study used equivalent scales which gave weight 0.8 to individuals who are less than 18 years old and 1 to individuals who are equal to or greater than 18 years old to reach per adult equivalent so that the expenditures of households be divided by this per adult equivalent and in this way true welfare levels of individuals were ascertained.

4 Adjustment of Prices

- Household income and expenditure surveys take time of more or less a year for their completion, so the different prices are faced by different households living at different regions during the period of a survey.

- So it is essential to make adjustment in the consumption expenditure for these price differences. The spatial price index called Paache price index at the primary sampling unit level was calculated using the median unit prices obtained from household surveys in order to remove price differences between urban and rural areas and among provinces and across the year. The same price index was used by (World Bank, 2002) and (FBS, 2001).

5 Conversion of Quantities into Calories

- Quantities consumed of food items obtained from the household income and expenditure surveys were converted into calories by using conversion factor.

- Requirements of calories are not the same for adults and children as well as males and females. Adults require more calories than females and children, while children need fewer calories than even female adults. So it needs to adjust the household size keeping in view age and sex of the members of the household. This study adjusted the household size using the nutrient based equivalent scales (1985), developed by planning commission, Government of Pakistan. Calories per adult equivalent were obtained by dividing the total calories consumed by the household by the so adjusted size of household.

2 Updating Poverty Line

- The main purpose of employing the absolute poverty line approach is that any contraction or expansion can be calculated against a fixed target.

- This means that poverty line measured under this approach should be consistent and remain unchanged over time. A poverty profile is said to be inconsistent if out of two households having the same living standard but living in different places, one is regarded as poor, while the other as non-poor (Ravallion and Bidani, 1994).

-   Consistency means that the welfare of each individual must be estimated against the same bench mark.

2 Updating Poverty Line

- For a poverty line to remain unchanged over time, it implies that poverty line should not change over time but only up to changes in prices.

- This means that poverty line should be adjusted by a suitable price index so that comparable poverty estimates over time can be obtained (Cheema, 2005; Kakwani, 2006; Jan,et al., 2008).

1 Updating Poverty Line by an Appropriate Price Index

- Absolute poverty line can be updated in two ways:

- 1-Poverty line calculated for the base year is updated using consumer price index or by employing Tornqvist price index (TPI) or by the combination of the both.

- These methods allow for changes in prices whereas the consumption basket associated with poverty line in the base year is kept constant.

- The poverty line remains constant over time and hence, poverty estimates are constant and comparable over time. Consumer price index and Tornqvist price index have some advantages and disadvantages.

Continue…

- The main advantage of consumer price index based 1990-91 is that it collects prices for 460 food as well as non-food items and the consumer price index based 2000-01 does the same for 375 items (food and non-food) regularly.

- One limitation of CPI is that it covers thirty five cities only. Since a large proportion of population of Pakistan is living in the rural areas, non-availability of the data on rural prices is likely to introduce bias in calculating true inflation rate which is the representative of the whole Pakistan.

Continue…

- The other way to calculate the inflation rate between two surveys is the Tornqvist price index (TPI). HIES surveys provide information on quantities and expenditure for majority of food items and a number of non-food items.

- Using this information, inflation rate between two surveys is calculated.

Continue…

- Its advantages include:
- (i) it uses unit prices for both rural and urban areas which are obtained by dividing the values of items by their quantities,
- (ii) the unit prices are the households' actual transactions.
- Its drawback is that the HIES surveys do not provide information on quantities for a number of non-food items. If such part of non-food items is ignored for the calculation of inflation rate, this would be a great biasness.

Continue…

- The best way to estimate inflation rate between two surveys of households is one that covers both rural and urban areas as well as large number of items.

- In other words composite price index which is the combination of consumer price index and Tornqvist price index is estimated.

- As the HIES surveys provide enough information on food and fuel items, so Tornqvist price index will be estimated for these items.

- For non-food and non-fuel items, consumer price index estimated by Federal Bureau of statistics, government of Pakistan on monthly basis will be utilized.

- This methodology has been used in Bangladesh by World Bank.

2 Estimating a New Poverty Line for a New Year

- It is very common in Pakistan to compute fresh poverty line for each survey. Under this method poverty line for the base year is not updated by the inflation rate between two survey periods.

- Rather, a new poverty line is computed from the recent available data set.

- This method allows for variations in prices as well as in the contents of consumption basket. The fresh poverty line would not be constant over time and hence, poverty estimates would not be comparable and consistent over time.

Continue…

- However, there are situations where new poverty line has to be calculated. The new poverty line is suggested only when price structure has changed significantly as a result of introduction of dramatic changes in the economy such as sudden liberalization of the economy.

- A new poverty line is also suggested when questionnaires in two different years are sharply different (Cheema, 2005).

Current study

- This study updated the poverty line by the Composite Price Index which is the combination of consumer price index (non-food and non-fuel items) calculated by Federal Bureau of Statistics, government of Pakistan and Tornqvist Price Index (TPI) (food and fuel items) calculated by the author from the surveys data. This study used the group weights of commodities and services in developing a Composite Price Index (Government of Pakistan, 2009).

- The Tornqvist Price Index was estimated as under:

$$\ln P_{10} = \sum_{k=1}^{n} \frac{w_{1k} + w_{0k}}{2} \ln\left(\frac{p_{1k}}{p_{0k}}\right)$$

Where

W_{1k} and w_{0k} are budget shares of items between the two periods

And p_{1k} and p_{0k} are price in two periods.

Poverty Indices

- This study estimated three measures of poverty namely, headcount ratio, poverty gap and squared poverty gap. These are given below:

- **1 Headcount Ratio**

- Headcount Index calculates the proportion of population whose income/consumption is below the poverty line (z):

Continue…

$$H = \frac{q}{N}$$

- H = Headcount index

  q = number of poor

  N = size of the population

- **Advantages**:
- It is sensitive to number of poor.
- It is direct and easy to calculate.
- It is most widely used poverty measure.

Continue…

- **Disadvantages**
- It does not satisfy the axiom of monotonicity e.g., it remains constant when the welfare of a poor person changes if he/she still remains under the poverty line.
- It does not meet the transfer axiom e.g., it remains unchanged when the income of a poor is transferred to other poor, relatively better off, but he/she still is under the poverty line.

Continue…

- **2 Poverty Gap**

- It measures the average distance between income/expenditure of the poor and the poverty line, expressed as a percentage of the poverty line. It depicts the depth of poverty. It is estimated as under:

$$PG = \frac{1}{n}\sum_{i=1}^{q}\left[\frac{z - y_i}{z}\right] if \ y_i \ < Z$$

Continue…

- Where y_i denotes the individual i's income and the sum is taken only over those people whom incomes are less than the poverty line.

- **Advantages**

- It is sensitive to the number of poor.

- It meets the axiom of monotonicity.

Continue…

- **Disadvantages**
- It does not satisfy the axiom of transfer e.g., poverty gap is not affected by a transfer of income from a poor person to another poor person, relatively better off, who still is under the poverty line.

Continue…

- *3* **Squared Poverty Gap (SPG)**

- Poverty gap calculates the distance that poor people fall from the poverty line, while the squared poverty gap considers the square of that distance. It depicts the severity of poverty:

$$SQP = (pg)^2$$

Continue…

- **Advantages**
- It meets the axiom of monotonicity.
- It also satisfies the axiom of transfer.

Axioms to be fulfilled by the Measure of Poverty to be a Suitable Measure

- A measure of poverty must satisfy the following axioms defined by Sen (1976 and 1979) to be a suitable measure:

- **Monotonic Axiom**

- Other things remaining the constant, a decrease in income of a poor under the poverty line must raise the measure of poverty.

Continue…

- **Scale Invariance Axiom**
- If the incomes of all are multiplied by the same positive number, the measure of poverty should remain the unchanged.

- **Focus Axiom**
- The position of the poor is dependent on the position of the only poor. The poverty measure remains unchanged to the changes in income for the non-poor.

Continue…

- **Transfer Axiom**
- Other things remaining the constant, when the income is transferred from a poor to other person, relatively better off, poverty measure must rise.

Continue…

- **Poverty Bands**
- Poverty line makes it possible that the whole population can be categorized into various bands of poverty:
- Extremely Poor
- Extremely poor are percentage of Population who have per adult equivalent expenditure per month less than fifty percent of the poverty line.
- Ultra Poor
- Ultra poor are percentage of population who have per adult equivalent expenditure per month greater than or equal to fifty percent but less than seventy five percent of the poverty line.

Continue…

- Poor
- Poor are percentage of population who have per adult equivalent expenditure per month greater than or equal to seventy five percent but less than one hundred percent of the poverty line.
- Vulnerable
- Vulnerable are percentage of population who have per adult equivalent expenditure per month greater than or equal to hundred percent but less than one hundred and twenty five percent of the poverty line.

- Quasi Non-poor
- Quasi non-poor are percentage of population who have per adult equivalent expenditure per month greater than or equal to one hundred and twenty five percent but less than two hundred percent of the poverty line.
- Non-poor
- Non-poor are percentage of population who have per adult equivalent expenditure per month greater than two hundred percent of the poverty line.

DETERMINANTS OF POVERTY

-
- Generally categorical regressions- Logit and Probit models are estimated to know the determinants of poverty.
- Qureshi and Arif (2001), Geda et al.(2005), Moke et al (2007), Bhaumik et al. (2006), Chaudhry (2009), Hashmi (2008), Sikandar and Ahmed (2008), Siddiqui (2009), Achia et al. (2010), and Apata et al. (2010) used these categorical regressions.
- Such like regressions are employed on the assumption that the consumption or income variables are not available.

- There is only known whether the household is poor or not, that is shown by categorical variable that take 1 if the household is poor, other wise it takes 0 World Bank (2002).

- There are some problems with the categorical regressions that estimates are sensitive to specification error.

- In case of probit model the parameters are biased if the distribution is not normal.

- More generally all information is not used by these models because income or expenditure is collapsed into a binary variable.

- These categorical regressions have predictive power for classifying the household as poor or not World Bank (2002).

- Thus as an alternative, OLS regression of log on the welfare indicator is estimated that uses full information for the dependent variable World Bank (2002). Jamal (2005) estimated for the same purpose using the HIES data 2001-02. Jan et al. (2008) estimated the same to find the determinants of poverty in rural sector in Pakistan. Fagemas and Wallace (2003), Alber and Collado (2004), Andesson et al. (2006), Baumik et al. (2006), Esanov (2006), Amendola and Vecchi (2008), Akerele and Adewuyi (2011), Sakuhunni et al. (2011) also used OLS regressions. Cheema and Sial (2012) estimated the multiple OLS regressions to find the poverty determinants by using the Household Income and Expenditure Survey data for the year 2005-06.

- This study also followed the same technique to find the determinants of poverty using the fresh available HIES data for the year 2010-11.

$$Ln(Expenditure) = \beta_0 + \beta_1 \ln(HS) + \beta_2 DR + \beta_3 EduHH + \beta_4 EduHH^2 + \beta_5 RB + \beta_6 SC + \beta_7 URBAN + \beta_8 EMPSTHH + \beta_9 OCPHH + \beta_{10} ANIT + e$$

$$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10}$$

$$H_1 = At\ least\ one\ of\ betas \neq 0$$

- Where

- HS=Household size, , EduHH= Education of household head, RB= Residential building, SC=shop and commercial building, EMPSTHH=employment status of household head, OCCHH=occupation of household head and ANIT=animal for transportation.