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HIGHLIGHTED HANDOUT

ECO615

Poverty and Income Distribution

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TYPES OF POVERTY

TOPIC 001: IMPORTANCE OF THIS COURSE

- To understand the level and intensity of the poverty problem.
- Role of institutions in provision of basic human needs to the poor.
- Performance measure of the Government policies outcome.
- To detect, whether policies are pro-poor or pro-rich.
- Achievement of millennium development goals and sustainable development goals.
- Active social scientist with knowledge on the poverty and inequality.

TOPIC 002: WHO IS POOR? POVERTY IS UNI-DIMENSIONAL OR MULTI-DIMENSIONAL PHENOMENA

- According to World Bank (2000), "poverty is pronounced deprivation in wellbeing." So, poverty is measured by comparing individuals' income or consumption with some defined threshold below which they are considered to be poor.
- Anyone who is deprived, is considered as poor. Deprivation is not uni-dimensional, its multi-dimensional (education, health, psychological, societal, political, gender, etc).
- The Poverty and Shared Prosperity series provides a global audience with the latest and most accurate estimates on trends in global poverty and shared prosperity. The 2018 edition "Piecing Together the Poverty Puzzle" broadens the ways we define and measure poverty.
- It introduces a multi-dimensional poverty measure that is anchored on household consumption and the international poverty line of \$1.90 per person per day but broadens the measure by including information on access to education and basic infrastructure.
- If a person earns below than \$1.90 per day, then he will be considered as poor.
- Upto 1990, it was considered that poverty is uni-dimensional but now the globe has realized that poverty in multi-dimensional phenomena.

TOPIC 003: TYPES OF POVERTY IN MULTI-PERSPECTIVE

Amartya Sen (1976) defined two main steps that poverty measurement must address:

1. Identifying the poor among the total population;
2. Creating a numerical measure of poverty.

Uni-dimensional methods can be applied when one has a well-defined single-dimensional resource variable, such as income and has been selected as the basis for poverty evaluation. This variable is typically assumed to be cardinal; however, in some cases the variable may only have ordinal significance. Identification in the uni-dimensional context normally proceeds by setting a poverty line corresponding to a minimum level below which one is considered poor.

Multi-dimensional Poverty Measure

This measure was first developed in 2007 and aimed at constructing poverty measurement methods that could be used with discrete and qualitative data as well as continuous and cardinal data.

Theoretically, it aimed at re-examine the identification step (addressing the question 'who is poor?'). This poses a much greater challenge when there are multiple dimensions. This measure provides an aggregate poverty measure that reflects the prevalence of poverty and the joint distribution of deprivations.

Poverty is a multidimensional phenomenon and less amenable to simple solutions

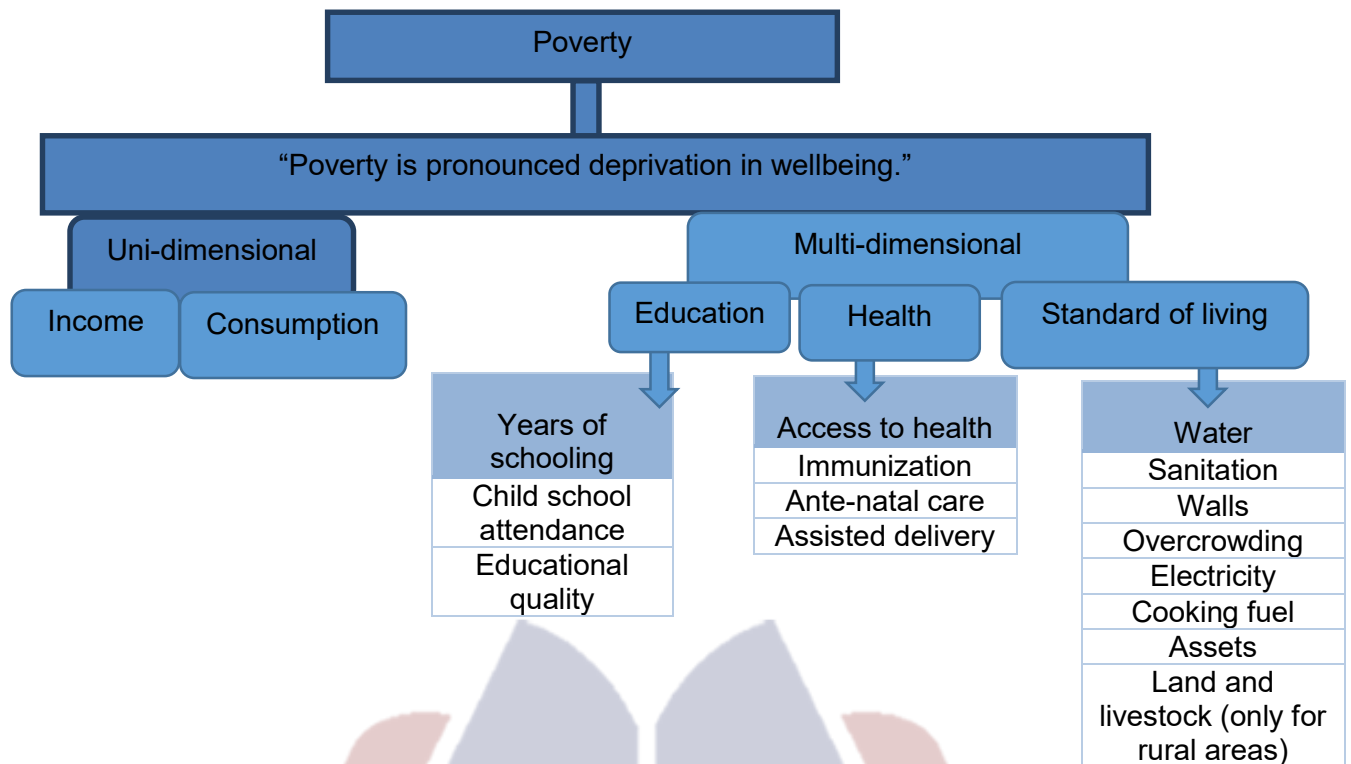
- Inadequate income
- Education
- Poor health

- Insecurity
- Low self-confidence
- Sense of powerlessness
- Absence of rights such as freedom of speech
- Poor quality of work
- Threat from violence
- Gender poverty
- Cultural poverty
- Political poverty

Types of poverty in multi-perspective

Whether people are able to obtain a specific type of consumption good:
Do they have enough food or shelter? Or health care? Or education?



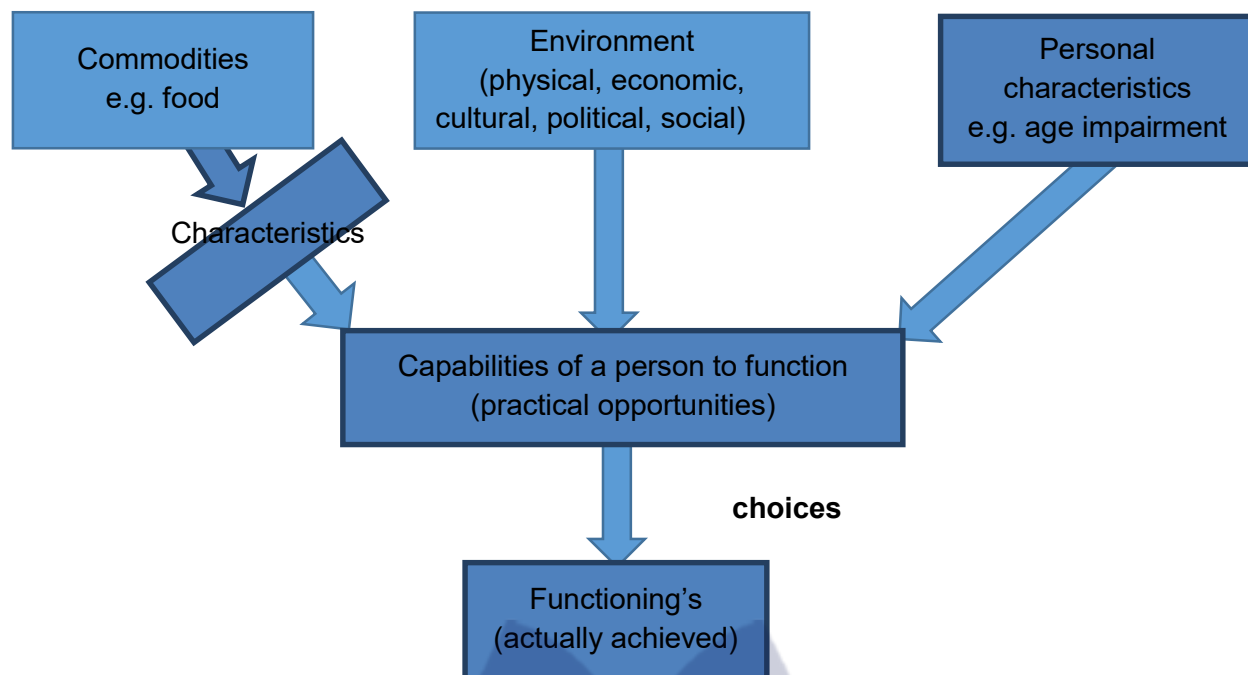


TOPIC 004: SEN'S CAPABILITY APPROACH FOR POVERTY

In Amartya Sen's capability approach, development is seen as a process of expanding the real freedoms of people. The capability to function is what matters the most and it goes beyond availability of commodities. In the capability approach, poverty is a situation where people lack the most basic capabilities to lead a reasonable life. *In the capabilities paradigm, poverty is understood as deprivation of basic capabilities.* Amartya Sen (1987), who argues that well-being comes from a capability to function in society. Thus, poverty arises when people lack key capabilities, and may get deprived of such capabilities in several ways; for example, ignorance, oppressive state policies, lack of financial resources, ill health, lack of proper education, sudden accidents, lack of security, absence of rights such as freedom of speech, lack of opportunities.

“The success of a society is to be evaluated primarily by the freedoms that members of the society enjoy” (Amartya Sen)

Sen's approach is both comprehensive and flexible. It provides dignity to human race because the economic model of development has reduced people to the status of producers and consumers. If the GDP growth model dis-empowers them, the capabilities approach makes their empowerment a central issue. Rather than talking of some theoretical equality of people or seeing them in terms of numbers, the capability approach explicitly recognizes the differences among individuals.



TOPIC 005: MULTI-DIMENSIONALITY OF POVERTY

The Multidimensional Poverty Index (MPI), developed by OPHI and UNDP's Human Development Report Office is a new measure to compute acute poverty. The MPI complements consumption based poverty measures by reflecting deprivations that individuals face in other dimensions such as education, health and standard of living.

The MPI captures the severe deprivations that each person experiences with respect to education, health and standard of living. The MPI provides disaggregated statistics on the main contributors to poverty in all its dimensions; education, health and standard of living.

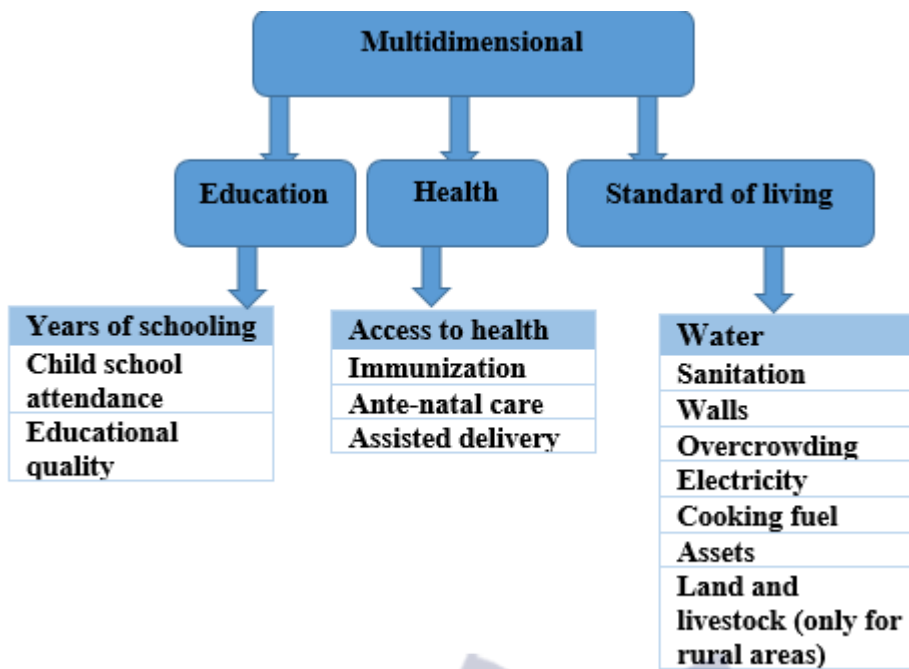
MPI is the product of two components:

- **Incidence of poverty (H):** the percentage of people who are identified as multidimensional poor, or the poverty headcount.
- **Intensity of Poverty (A):** the average percentage of dimensions in which poor people are deprived. In simple terms it means how intense, how bad the multidimensional poverty is, on average, for those who are poor.

Poverty is a multidimensional phenomenon and less amenable to simple solutions

- Inadequate income, Education, Poor health. Insecurity, Low self-confidence, Sense of powerlessness, Absence of rights such as freedom of speech, Poor quality of work, Threat from violence, Gender poverty, Cultural poverty, Political poverty etc

Pakistan's national MPI constitutes three dimensions; health, education and standard of living and 15 indicators. While each dimension carries an equal weight of 1/3, the weights of component indicators differ.



TOPIC 006: POVERTY, INEQUALITY AND VULNERABILITY

Poverty is related to, but distinct from, inequality and vulnerability.

What is Poverty?

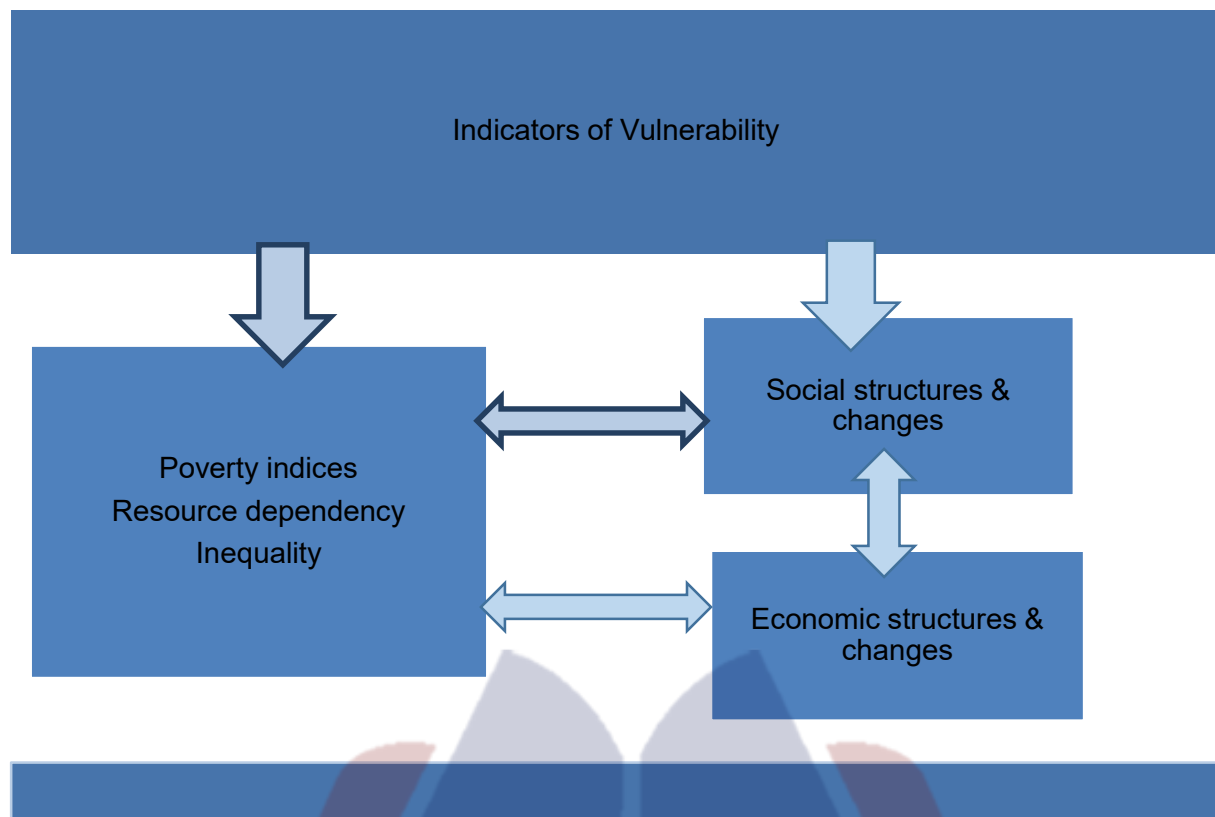
- A simple definition of poverty is lack of income. But in practice, poverty may mean lack of many things (education, health, dignity, freedom, etc.)
- According to WB (2000), “poverty is pronounced deprivation in wellbeing.”
- The conventional view links well-being primarily to command over commodities, 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.

Inequality

Inequality focuses on the distribution of attributes, such as income or consumption, across the whole population. In the context of poverty analysis, inequality requires examination if one thinks that the welfare of individuals depends on their economic position relative to others in a society.

Vulnerability

the risk of falling into poverty in the future, even if the person is not necessarily poor now; it is often associated with the effects of “shocks”.it affects individuals’ behavior in terms of investment, production patterns, and coping strategies, and in terms of the perceptions of their own situations.



WHY MEASURE POVERTY?

TOPIC 007: 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.

- Keeping Poor People on the Agenda
- Targeting Domestic and Worldwide Interventions
- Monitoring and Evaluating Projects and Policy Interventions
- Evaluating the Effectiveness of Institutions

TOPIC 008: KEEPING POOR PEOPLE ON 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 thus necessary if it is to appear on the political and economic agenda.

TOPIC 009: TARGETING DOMESTIC AND WORLDWIDE INTERVENTIONS

A second reason for measuring poverty is in order to target interventions. Clearly, one cannot help the poor without at least knowing who they are. This is the purpose of a poverty profile, which sets out the major facts on poverty (and, typically, inequality), and then examines the pattern of poverty, to see how it varies by geography (by region, urban/rural, mountain/plain, etc.), by community characteristics (e.g. in communities with and without a school, etc.), and by household characteristics (e.g. by education of household head, by size of household). A well-presented poverty profile is invaluable, even though it typically uses rather basic techniques such as tables and graphs.

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. 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.

TOPIC 010: MONITORING AND EVALUATING PROJECTS AND POLICY INTERVENTIONS

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. To judge the effects, one would ideally like to monitor the effects of a policy on the poor, 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.

TOPIC 011: TO EVALUATE THE EFFECTIVENESS OF INSTITUTIONS WHOSE GOAL IS TO HELP POOR PEOPLE

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 good information on poverty. This does not only apply to governments. "Our dream is a world free of poverty", writes

the World Bank, and its first mission statement is “to fight poverty with passion and professionalism for lasting results”. The institutions success in pursuing this goal can only be judged if there are adequate measures of poverty.

TOPIC 012: THINKING SYSTEMATICALLY: POVERTY REDUCTION STRATEGY PAPERS

Measurement is necessary but not sufficient. It is also important to think clearly and systematically about how the position of poor people may be improved, and to act accordingly. To do this, the World Bank favors the Poverty Reduction Strategy Paper process. First introduced for Highly Indebted Poor Countries (HIPC) in 1999, this approach begins with a country-driven policy paper setting out a long-term strategy for fighting poverty and rooted in the latest available data and analysis.

Once poverty is measured and the poor are identified, the next steps in the PRSP are to choose public actions and programs that have the greatest impact on poverty, identify indicators of progress, and monitor change in a systematic manner. Poverty measurement and diagnostics are therefore central to informing policy making for poverty reduction in many countries. The creation of a good PRSP requires strong technical support. A central purpose of this manual is to impart the technical and analytical skills needed for this purpose.

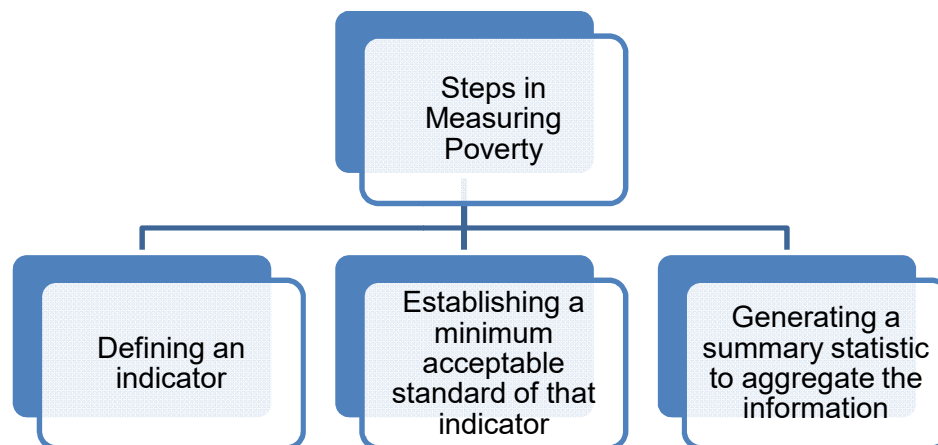


TOPIC 013: MULTI-DIMENSIONAL POVERTY INDEX

Table-3: Pakistan's National MPI-Indicators, deprivations cut offs and weights			
Dimension	Indicators	Deprivation Cutoff	Weights
Education	Years of Schooling	Deprived if no man AND no woman in the household above 10 years of age has completed 5 years of schooling	1/6 = 16.66%
	Child attendance	Deprived if any school-aged child is not attending school (ages between 6-11)	1/8 = 12.5%
	Educational quality	Deprived if any child not going to school because of quality issues (not enough teachers, far away, too costly, no male/female, substandard school), or is attending but dissatisfied with service	1/24 = 4.17%
Health	Access to clinic / BHU	Deprived if not using health facility at all, or only once in awhile, because of access constraints (too far, too costly, does not suit, lack of tools / staff, not enough facility)	1/6 = 16.67%
	Immunization	Deprived if any child under 5 is not fully immunized according to vaccinations calendar (households with no children under 5 are considered non-deprived).	1/18 = 5.56%
	Ante-natal care	Deprived if any woman has given birth in the household in the last 3 years did not received ante-natal check-up (household with no woman that has given birth are considered non-deprived).	1/18 = 5.56%
	Assisted delivery	Deprived if any woman that has given birth in the household in the last 3 years with untrained personnel (family member, friend, etc.) or in inappropriate facility (home, other) – household with no woman that has given birth are considered non-deprived	1/18 = 5.56%
Standard of Living	Water	Deprived if household has no access to improved source of water according to MDGs standards considering distance (less than 30 minutes for return trip): tap water, hand pump, motor pump, protected well, mineral water	1/21 = 4.76%
	Sanitation	Deprived if household has no access to adequate sanitation according to MDGs standards: flush system (sewerage, septic tank, drain), privy seat.	1/21 = 4.76%
	Wall	Deprived if household has no unimproved walls (mud, uncooked mud brick, wood/bamboo, other).	1/42 = 2.38%
	Overcrowding	Deprived if household is overcrowded (4 or more people per room).	1/42 = 2.38%
	Electricity	Deprived if household has no access to electricity	1/21 = 4.76%
	Cooking fuel	Deprived if household uses solid cooking fuels for cooking (wood, dung, cakes, crop residue, coal/charcoal, other)	1/21 = 4.76%
	Assets	A household is categorized as deprived if it doesn't have more than two small assets (radio, TV, iron, fan, sewing machine, VCP, chair, watch, air cooler, bicycle), OR no large asset (refrigerator, air conditioner, tractor, computer, motorcycle), AND has no car.	1/21 = 4.76%
	Land and livestock (only for rural areas)	Deprived if hh is deprived in land AND deprived in livestock, meaning: a) Deprived in land: hh has less than 2.25 acres of non-irrigated land AND less than 1.125 acres of irrigated land b) Deprived in livestock: hh has 1 or no cattle, less than 3 sheep/goat, less than 5 chicken AND no animal for transportation. [Urban households assumed non-deprived]	1/21 = 4.76%
Source: Poverty Section, Planning Commission			

HOUSEHOLD SURVEY'S IN POVERTY MEASUREMENT

TOPIC 014: STEPS IN MEASURING POVERTY



TOPIC 015: HOUSEHOLD SURVEYS FOR MEASURING POVERTY

Household surveys are playing an increasingly important role in the measurement of poverty and well-being around the world. The Living Standards Measurement Study, which was begun in the World Bank under the guidance of Graham Pyatt in 1979, has played an important role in this movement. Its surveys are widely used within the Bank to measure consumption-based poverty, and survey data are now the exclusive basis for the global poverty counts.

TOPIC 016: KEY ISSUES IN HOUSEHOLD SURVEY

Recognize the strengths and limitations arising from the need to use survey data in poverty analysis, including the choice of

- Sample frame
- Unit of observation
- Time period
- Choice of welfare indicators.

The sample frame

The survey may represent a whole country's population, or some more narrowly defined subset, such as workers or residents of one region. The appropriateness of a survey's particular sample frame will depend on the inferences one wants to draw from it. Thus, a survey of urban households would allow one to measure urban poverty, but not poverty in the country as a whole.

The unit of observation

This is typically the household or occasionally the individuals within the household. A household is usually defined as a group of persons eating and living together.

The number of observations over time

Most surveys are single cross-sections, covering a sample of households just once. Longitudinal surveys, in which the same households or individuals are resurveyed one or more times (also called panel data sets) are more difficult to do, but these have been undertaken in a

several countries (for example, the Vietnam Living Standards Surveys of 1992–93 and 1997–98, or parts of the Thailand Socioeconomic Surveys of 2002 and 2004),

The principal living standard indicator collected

Most measures of welfare are based on household consumption expenditure or household income. Many surveys collect both, although this typically requires two interviews per household: to save on costs, some surveys gather data on either income or expenditure.

Given budget constraints, there are always tradeoffs: Since a more detailed and complex questionnaire takes longer to administer, the sample size will have to be smaller, which reduces the precision of the statistics based on these data and limits the amount of disaggregation (for example, to the provincial level) that is possible.

TOPIC 017: SURVEY DESIGN AS COMMON PROBLEM

If the sample on which a survey is based is not random, then the resulting estimates of poverty are almost impossible to interpret. They are likely to be biased, but we do not know by how much

A simple national random sample would create a list of everyone in the country and then randomly choose subjects to be interviewed, with each person having an equal chance of being selected.

In practice, sampling always falls short of this ideal for three reasons.

- First, some people or households may be hard to find; for instance, most surveys interview people at their homes, but this completely overlooks homeless persons, a group that is likely to be poor.
- Second, some of the surveys that have been used to measure poverty were not designed for this purpose in that their sample frames were not intended to span the entire population.
- Third, it is very often cost-effective deliberately to oversample some small groups (for example, minority households in remote areas) and to under sample large and homogeneous groups. Such stratified random sampling whereby different subgroups of the population have different (but known) chances of being selected but all have an equal chance in any given subgroup can increase the precision in poverty measurement obtainable with a given number of interviews.

TOPIC 018: KEY QUESTIONS TO ASK ABOUT ANY SURVEY

Key questions to ask about any survey are the following:

- Does the sample frame (the initial listing of the population from which the sample was drawn) span the entire population?
- Is there likely to be a response bias? This may take one of two forms: unit nonresponse, which occurs when some households do not participate in the survey, and item nonresponse, which occurs when some households do not respond fully to all the questions in the survey.

TOPIC 019: USE OF SURVEY DATA FOR POVERTY AND INEQUALITY MEASUREMENT

Two important implications flow from the fact that measures of poverty and inequality are always based on survey data.

- First, it means that actual measures of poverty and inequality are *sample statistics*, and so estimate the true population parameters with some error. Although it is standard practice to say that, for instance, “the poverty rate is 15.2 percent,” it would be more accurate to say something like “We are 99 percent confident that the true poverty rate is between 13.5 percent and 16.9 percent; our best point estimate is that it is 15.2 percent.” Outside of academic publications, such caution is, unfortunately, rather rare.

- The second implication is that it is essential to know how the sampling was done, because the survey data may need to be weighted in order to get the right estimates of such measures as mean income or poverty rates. In practice, most household surveys oversample some areas (such as low-density mountainous areas, or regions with small populations), to get adequately large samples to compute tolerably accurate statistics for those areas. Conversely, areas with dense, homogeneous populations tend to be under sampled. For instance, the Vietnam Living Standards Survey of 1997/98 (VLSS98) oversampled the sparsely populated central highlands and under sampled the dense and populous Red River delta (Vietnam 2000).

TOPIC 020: EXAMPLE; IMPLICATIONS OF POVERTY MEASURES THROUGH SURVEY

Table 2.1 Illustration of Why Weights Are Needed to Compute Statistics Based on Stratified Samples

	Region A	Region B	Whole country
Population (million)	2.0	8.0	10.0
True income/capita (\$/year)	500	1,375	1,200
Case 1. Simple random sampling. Use simple average.			
Sample size (given initially)	400	1,600	2,000
Estimated total income, \$	196,000 $= 400 \times 490$	2,235,200 $= 1,600 \times 1,397$	2,431,200 $= 196,000 + 2,235,200$
Estimated income/capita, (\$/year)*	490	1,397	1,215.6 $= 2,431,200/2,000$
Case 2. Stratified sampling.			
Sample size (given initially)	1,000	1,000	2,000
Estimated total income, \$	490,000 $= 1,000 \times 490$	1,397,000 $= 1,000 \times 1,397$	1,887,000 $= 490,000 + 1,397,000$
Case 2a. Stratified sample, using simple average. This is incorrect, so don't do this!			
Estimated income/capita (\$/year)	490	1,397	943.5 $= 1,887,000/2,000$
Case 2b. Stratified sampling, using weighted average. This is the correct approach.			
Weight (Based on population)	0.2 $= 2.0/10.0$	0.8 $= 8.0/10.0$	
Estimated income/capita (\$/year)	490	1,397	1,215.6 $= (0.2 \times 490) + (0.8 \times 1,397)$

SAMPLING TECHNIQUES AND QUESTIONNAIRES

TOPIC 021 AND 022: SAMPLING TECHNIQUES USED FOR DATA COLLECTION ON POVERTY; RANDOM/STRATIFIED SAMPLING/CLUSTER SAMPLING

Simple random sampling	Stratified sampling	Cluster sampling
Simplest sampling design	Homogeneity within the group	Homogeneity between group
In simple random sampling each element has an equal chance of being selected	Heterogeneity between groups	Heterogeneity within groups
The procedure for selecting a Simple Random Sample is as follows: List all the units in the population (construct a sampling frame if one does not exist already), say from 1.... N	All groups are included	Random selection of groups
	Random sampling in each group	Census with in the groups
	Sampling efficiency improved by increasing accuracy at a faster rate than cost.	Sampling efficiency improved by decreasing cost at a faster rate than accuracy.

TOPIC 023: NATURE OF QUESTIONS DURING POVERTY SURVEYS

- More detailed the questions about income and expenditure.
- It is important to collect information on the volume and value of “own consumption”.
- It is also essential to collect enough information on housing (rent or current capital value if the household owns its residence). The main durable goods (age, purchase price, current value), In order to be able to quantify these important components of expenditure and income.

TOPIC 024: VARIABILITY AND TIME PERIOD DURING POVERTY MEASUREMENT

- Income and consumption vary from month to month, year to year, and over a lifetime. But income typically varies more significantly than consumption.
- In less-developed countries, most analysts prefer to use current consumption than current income as an indicator of living standards in poor countries for the following reasons:
 - In the short run it reflects more accurately the resources that households control.
 - Over the long term, it reveals information about incomes at other dates, in the past and future.
 - In poor countries, income is particularly difficult to measure accurately, especially in agriculture and for pastoralists.

This does not mean that consumption is a perfect measure of well-being. Any household that is credit-constrained—and this is likely to be especially true of poorer households—will be limited in the extent to which it can smooth consumption over its lifecycle.

TOPIC 025: COMPARISON OF DIFFERENT HOUSEHOLDS WITH SAME DEMOGRAPHIC CHARACTERISTICS

- Households vary not only in their income or expenditure levels, but in size, in the prices they face,
- In the publicly provided goods (such as roads and schools) to which they have access,
- In the amount of leisure time they enjoy, and in the agreeableness of the environment in which they live (some areas are too hot or too cold or too dry or too flood-prone).

- This makes it difficult to compare household welfare across households.

Example:

Thus an annual income of US\$1,000 might suffice for a couple living in a rural area, where food and housing are cheap, but it would be utterly inadequate for a family of four in an urban setting.

TOPIC 026: KEY FEATURES OF STANDARDIZED SURVEYS FOR POVERTY MEASUREMENT

Motivated by the need to measure poverty more accurately,

- The World Bank has taken the lead in the development of relatively standard, reliable household surveys, under its Living Standards Measurement Surveys (LSMS) project.

The LSMS surveys have two key features:

- Multi-topic questionnaires
- Considerable attention to quality control.

TOPIC 027: MULTI-TOPIC QUESTIONNAIRES

The LSMS surveys ask about a wide variety of topics, not simply demographic characteristics or health experience or some other narrow issue.

- Household questionnaire
- Community questionnaire
- Price questionnaire

• Household questionnaire

The most important single questionnaire is the household questionnaire, which often runs to 100 pages or more. The household questionnaire asks about household composition; consumption patterns, including food and nonfood; assets including housing; landholding and other durables; income and employment in agriculture/nonagricultural and wage/self-employment; sociodemographic variables, including education, health, migration, and fertility; and anthropometric information, especially the height and weight of each household member.

• Community questionnaire

In community questionnaire community leaders (teachers, health workers, village officials) for information about the whole community, such as the number of health clinics, access to schools, tax collections, demographic data, and agricultural patterns. Sometimes there are separate community questionnaires for health and education.

• Price questionnaire

The third part is the price questionnaire, which collects information about a large number of commodity prices in each community where the survey is undertaken. This is useful because it allows analysts to correct for differences in price levels by region and over time.

TOPIC 028: QUALITY CONTROL

The LSMS surveys are distinguished by their attention to quality control.

- They devote a lot of attention to obtaining a representative national sample (or regional sample, in a few cases).
- Make extensive use of screening questions and associated skip patterns.
- Numbered response codes are printed on the questionnaire.
- Questionnaires are designed to be easy to change and to translate.
- The data are collected by decentralized teams.
- The data entered are subject to a series of range checks.
- The LSMS data are usually of high quality, with accurate entries and few missing values.

- It is expensive to maintain high quality; the surveys are usually quite small; the median LSMS survey covers just 4,200 households.
- The LSMS data have a fairly rapid turnaround time, with some leading to a statistical abstract (at least in draft form) within two to six months of the last interview.



APPROACHES IN MEASURING POVERTY

TOPIC 029: MEASURING POVERTY: CHOOSING AN INDICATOR OF WELFARE:

There are a number of ways to measure well-being.

- The welfarist approach
- Non-welfarist approach
- Expenditure as measure of welfare

TOPIC 030: THE WELFARIST APPROACH

The welfarist approach (Sen1979) seeks to measure household utility, which in turn is usually assumed to be approximated by household consumption expenditure or household income; these may be considered as inputs into generating utility. Given enough income, the household is assumed to know best how to deploy these resources, whether on food, clothing, housing, or the like. When divided by the number of household members, this gives a per capita measure of consumption expenditure or income.

Of course, even household expenditure or income is an imperfect proxy for utility; for instance, it excludes potentially important contributors to utility such as publicly provided goods or leisure.

Non-welfarist approach

A more paternalistic, or non-welfarist, approach might focus on whether households have attained certain minimal levels of, say, nutrition or health. Thus, while the welfarist approach focuses on per capita consumption expenditure or income, other (nonwelfarist) measures of individual welfare might include indicators such as infant mortality rates in the region, life expectancy, the proportion of spending devoted to food, housing conditions, or child schooling; these may be thought of as measures of output, reflections of utility rather than inputs into the generation of utility.

TOPIC 031: EXPENDITURE AS MEASURE OF WELFARE

If we choose to assess poverty based on household consumption or expenditure per capita, it is helpful to think in terms of an expenditure function, which shows the minimum expense required to meet a given level of utility u , which is derived from a vector of goods x , at prices p . It can be obtained from an optimization problem in which the objective function (expenditure) is minimized subject to a set level of utility, in a framework where prices are fixed.

Let the consumption measure for the household i be denoted by y_i . Then an expenditure measure of welfare may be denoted by

$$y_i = p \cdot q = e(p, x, u)$$

where p is a vector of prices of goods and services, q is a vector of quantities of goods and services consumed, $e(\cdot)$ is an expenditure function, x is a vector of household characteristics (number of adults, number of young children, and so on), and u is the level of "utility" or well-being achieved by the household.

TOPIC 032: MONETARY MEASURE; INCOME AS POVERTY MEASURE

Income: defined in principle as **consumption + change in net worth**, is generally used as a measure of welfare in developed countries, but it tends to be seriously understated in less-developed countries. Consumption is less understated and comes closer to measuring permanent income.

$$\text{Income} = \text{Consumption} + \text{Change in net worth}$$

Example: Suppose I had assets of \$10,000 at the beginning of the year. During the year I spent \$3,000 on consumption. And at the end of the year I had \$11,000 in assets. Then my income was \$4,000, of which \$3,000 was spent, and the remaining \$1,000 added to my assets.

TOPIC 033: ISSUES IN INCOME AS A GOOD MEASURE OF POVERTY

- People forget, particularly when asked in a single interview, about items they may have sold, or money they may have received, up to a year before.
- People may be reluctant to disclose the full extent of their income, lest the tax collector or a neighbor get wind of the details.
- People may be reluctant to report income earned illegally, for instance, from smuggling, corruption, poppy cultivation, or prostitution.
- Some parts of income are difficult to calculate, for example, the extent to which the family buffalo has risen in value.

TOPIC 034: CONSUMPTION AS POVERTY MEASURE

Consumption includes both goods and services that are purchased and those that are provided from one's own production (in-kind).

Table 2.3 Income and Expenditure by per Capita Expenditure Quintiles, Vietnam
(In thousands of dong per capita per year, 1992/93)

	Lowest	Lower-mid	Middle	Mid-upper	Highest	Overall
Income/capita	494	694	956	1,191	2,190	1,105
Expenditure/capita	518	756	984	1,338	2,540	1,227
Memo						
Food spending/capita	378	526	643	807	1,382	747
Food as % of expenditure	73	70	65	60	54	61

Source: Vietnam 1994.

Note: In 1993, exchange rate was about 10,000 dong/US\$.

TOPIC 035: COMPARISON OF INCOME VS CONSUMPTION AS POVERTY MEASURE

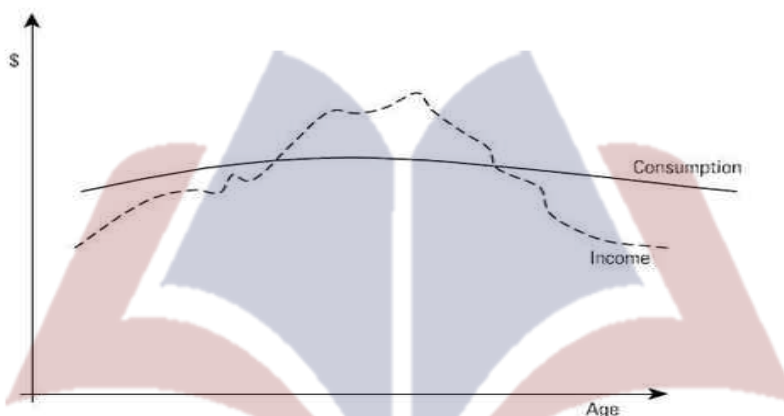
- In developed countries, a strong case can be made that consumption is a better indicator of lifetime welfare than is income.
- Income typically rises and then falls in the course of one's lifetime, in addition to fluctuating somewhat from year to year, whereas consumption remains relatively stable.
- This smoothing of short-term fluctuations in income is predicted by the permanent income hypothesis, under which transitory income is saved while long-term (permanent) income is largely consumed.

CONSUMPTION MEASUREMENT AND POVERTY SURVEY'S**TOPIC 036: LIFE CYCLE HYPOTHESIS FOR INCOME AND CONSUMPTION OVER TIME**

The Life cycle hypothesis was developed by Franco Modigliani in 1957. The theory states that individuals seek to smooth consumption over the course of a lifetime borrowing in times of low income and saving during periods of high income.

The lifecycle of income and consumption is captured graphically in figure 2.2. While the available evidence does not provide strong support for this lifecycle hypothesis in the context of less-developed countries, households there do appear to smooth out the very substantial seasonal fluctuations in income that they typically face during the year (see Alderman and Paxson 1994; Paxson 1993). Thus, information on consumption over a relatively short period, such as one a month, as typically collected by a household survey is more likely to be representative of a household's general level of welfare than equivalent information on income, which is more volatile.

Figure 2.2 Lifecycle Hypothesis: Income and Consumption Profile over Time

**TOPIC 037: MEASURING DURABLE GOODS IN POVERTY MEASURES**

In measuring poverty, it might be argued that only food, the ultimate basic need (which constitutes seven-tenths of the spending of poor households), should be included. On the other hand, even households that cannot afford adequate quantities of food devote some expenditures to other items, such as clothing, and shelter.

The problem is that durable goods, such as bicycles and televisions, are bought at a point in time, and then consumed over a period of several years. Consumption should only include the amount of a durable good that is eaten up during the year, which can be measured by the change in the value of the asset during the year, plus the cost of locking up one's money in the asset.

Example: For instance, if my watch was worth \$25 a year ago, and is worth \$19 now, then I used \$6 worth of watch during the year; I also tied up \$25 worth of assets in the watch, money that could have earned me \$2.50 in interest (assuming 10 percent) during the year. Thus, the true cost of the watch during the year was \$8.50. This is essentially the amount that I would have to pay if I were to try to rent the watch for a year.

TOPIC 038: VALUE OF HOUSING SERVICES IN POVERTY MEASURES AND HOUSEHOLD SURVEYS:

- If you own your house or apartment, it provides housing services that should be considered as part of consumption.
- The most satisfactory way to measure the values of these services is to ask how much you would have to pay if, instead of owning your home, you had to rent it, although this question is seldom asked in practice.
- The standard procedure is to estimate, for those households that rent their dwellings, a function that relates the rental payment to such housing characteristics as the size of the house (in square feet of floor space), the year in which it was built, the type of roof, and whether there is running water. This gives the following:

Rent = f (area, running water, year built, type of roof, location, number of bathrooms)

TOPIC 039: WEDDING AND FUNERAL IN CONSUMPTION/SURVEYS

- Families spend money on weddings.
- Such spending is often excluded when measuring household consumption expenditure.
- The logic is that the money spent on weddings mainly gives utility to the guests, not the spender.
- Of course if one were to be strictly correct, then expenditure should include the value of the food and drink that one enjoys as a guest at other people's weddings, although in practice this is rarely included.
- Alternatively, one might think of wedding expenditures as rare and exceptional events, which shed little light on the living standard of the household.
- Similar considerations apply to other large and irregular spending, on items such as funerals and dowries

TOPIC 040: DIFFERENCES IN HOUSEHOLD COMPOSITION

Households differ in size and composition, and so a simple comparison of aggregate household consumption can be quite misleading about the well-being of individuals in a given household. Most researchers recognize this problem and use some form of normalization.

The most straightforward method is to convert from household consumption to individual consumption by dividing household expenditures by the number of people in the household.

Then, total household expenditure per capita is the measure of welfare assigned to each member of the household. Although this is by far the most common procedure, it is not very satisfactory for two reasons:

- First, different individuals have different needs. A young child typically needs less food than an adult, and a manual laborer requires more food than an office worker.
- Second, there are economies of scale in consumption, at least for such items as housing. It costs less to house a couple than to house two individuals separately.

TOPIC 041: EXAMPLE ON COMPARISON

Example: Suppose we have a household with two members and monthly expenditure of \$150 in total. We would then assign each individual \$75 as their monthly per capita expenditure. If we have another household with three members, it would appear that each member is worse off, with only \$50 per capita per month. However, suppose we know that the two-person household contains two adult males age 35, whereas the second household contains one adult female and two young children. This added information may change our interpretation of the level of well-being in the second household, since we suppose that young children may have much lower costs (at least for food) than adults.

EQUIVALENT SCALES IN POVERTY MEASUREMENT

TOPIC 042: ADULT EQUIVALENTS IN POVERTY MEASUREMENT

For a household of any given size and demographic composition (such as one male adult, one female adult, and two children), an equivalence scale typically measures the number of adult males to which that household is deemed to be equivalent. Each member of the household counts as some fraction of an adult male. Effectively, household size is the sum of these fractions and is not measured in numbers of persons but in numbers of adult equivalents. Economies of scale can be allowed for by transforming the number of adult equivalents into effective adult equivalents.

TOPIC 043: OECD SCALE FOR ADULT EQUIVALENT

OECD scale The OECD scale is widely used, and may be written as

$$AE = 1 + 0.7 (N_{adults} - 1) + 0.5 N_{children}$$

Where, AE refers to “adult equivalent.” A one-adult household would have an adult equivalent of 1, a two-adult household would have an AE of 1.7, and a three-adult household would have an AE of 2.4. Thus the 0.7 reflects economies of scale; the smaller this parameter, the more important economies of scale are considered to be.

In developing countries, where food constitutes a larger part of the budget, economies of scale are likely to be less pronounced than in rich countries. The 0.5 is the weight given to children, and presumably reflects the lower needs (for food, housing space, and so forth) of children.

TOPIC 044: OTHER SCALES FOR ADULT EQUIVALENCE

Many other scales have been used. For instance, a number of researchers used the following scale in analyzing the results of the LSMS that were undertaken in the Côte d'Ivoire, Ghana, and Peru (Glewwe and Twum-Baah 1991:

Age (years)	0-6	7-12	13-17	>17
Weight (i.e., adult equivalences)	0.2	0.3	0.5	1.0

An elegant formulation is as follows:

$$AE = (N_{adults} + \alpha N_{children})^{\theta}$$

where α measures the cost of a child relative to an adult, and $\theta \leq 1$ is a parameter that captures the effects of economies of scale. Consider a family with two parents and two children. For $\alpha = \theta = 1$, $AE = 4$ and our welfare measure becomes expenditure per capita. But if $\alpha = 0.7$ and $\theta = 0.8$, then $AE = 2.67$, and the measure of expenditure per adult equivalent will be considerably larger. Comparison of income vs consumption as indicator of welfare.

TOPIC 045: ESTIMATE AN EQUIVALENCE SCALE

Several researchers have tried to estimate the extent to which there are economies of scale in consumption, essentially by looking at how aggregate household consumption of goods, such as food, varies with household size and composition (for example, Pendakur 1999; see, too, Jenkins and Cowell 1994). There are a number of problems here.

- First, it assumes that resources like food are equitably distributed within the household, although in practice the intrahousehold allocation is likely to reflect the distribution of power among household members.
- Second, there is a very basic identification problem: If children provide utility to parents, then how can we say that a couple with a child, earning \$10,000, is necessarily worse off than a childless couple with the same income? (Pollack and Wales 1979). The consensus view is summed up by Deaton and Zaidi (1998), who argue, “there are so far no satisfactory methods for estimating economies of scale.”

TOPIC 046: LOGIC OF INCOME OR EXPENDITURES IN DEVELOPING AND DEVELOPED ECONOMIES FOR POVERTY

- Most rich countries measure poverty using income, while most poor countries use expenditure.
- There is a logic to this; in rich countries, income is comparatively easy to measure (much of it comes from wages and salaries), while expenditure is complex and hard to quantify.
- On the other hand, in less-developed countries income is hard to measure (much of it comes from self-employment), while expenditure is more straightforward and hence easier to estimate.



COMPARISON OF POVERTY INDICATORS

TOPIC 47: COMPARISON OF INCOME VS CONSUMPTION FOR WELFARES

Income pros: • Easy to measure, given the limited number of sources of income. • Costs only a fifth as much to collect as expenditure data, so sample can be larger. Income cons: • Likely to be underreported. • May be affected by short-term fluctuations (for example, the seasonal pattern of agriculture). • Some parts of income are hard to observe (for example, informal sector income, home agricultural production, self-employment income). • Link between income and welfare is not always clear.	Consumption pros: • Less understated than income. • Expenditure is easier to recall. • Shows current actual material standard of living. Consumption cons: • Households may not be able to smooth consumption (for example, via borrowing, social networks). • Consumption choices made by households may be misleading (for example, if a rich household chooses to live simply that does not mean it is poor). • Some expenses are not incurred regularly, so data may be noisy. • Difficult to measure some components of consumption, including durable goods.
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Consumption ("achievement")

While consumption per capita is the most commonly used measure of welfare.

TOPIC 048: CALORIE APPROACH IN POVERTY MEASURE

If one accepts the (non-welfarist) notion that adequate nutrition is a prerequisite for a decent level of well-being, then we could just look at the quantity of calories consumed per person. Anyone consuming less than a reasonable minimum often set at 2350 Calories per person per day would be considered poor. However, at this point we just note that it is not always easy to measure calorie intake, particularly if one wants to distinguish between different members of a given household. Nor is it easy to establish the appropriate minimum number of calories per person, as this will depend on the age, gender, and working activities of the individual.

TOPIC 049: FOOD CONSUMPTION AS A FRACTION OF TOTAL EXPENDITURE

Over a century ago, Ernst Engel observed in Germany that as household income per capita rises, spending on food rises too, but less quickly.

Example: For instance, households that devote more than (say) 60 percent of their expenditures to food might be considered to be poor. The main problem with this measure is that the share of spending going to food also depends on the proportion of young to old family members (more children indicates a higher proportion of spending on food), and on the relative price of food (if food is relatively expensive, the proportion of spending going to food will tend to be higher).

TOPIC 050: ANTHROPOMETRIC STANDARD AS POVERTY MEASURE

Establishing a baseline anthropometric standard against which to judge whether someone is malnourished., anthropometric indicators have the advantage that they can reveal living conditions within the household (rather than assigning the overall household consumption measure across all members of the household without really knowing how consumption expenditure is divided among household members).

TOPIC 051: PEER ASSESSMENT AS POVERTY MEASURE

In Vietnam, very poor households are eligible for some subsidies, to cover health care and educational fees, for instance. The decision about who qualifies as being sufficiently poor is taken at the village level, where the local People's Committee typically knows enough about individual households to make the determination some analysts use consumption per adult equivalent, in order to capture differences in need by age, and economies of scale in consumption.

TOPIC 052: POVERTY AND QUALITY OF LIFE INDICATORS

There is variety of indicators used as quality of life indicators from education, health and societal perspective.

Countries	GNP per capita (1999 dollars)	% population below poverty line	Female life expectancy at birth, years (1998)	Prevalence of child malnutrition, % children <5 years (1992-98)	Female adult illiteracy rate, % of people 15+ years, (1998)
Algeria	1,550	22.6 (1995)	72	13	46
Bangladesh	370	35.6 (1995/96)	59	56	71
Cambodia	260	36.1 (1997)	55	—	80
Colombia	2,250	17.7 (1992)	73	8	9
Indonesia	580	20.3 (1998)	67	34	20
Jordan	1,500	11.7 (1997)	73	5	17
Morocco	1,200	19.0 (1998/99)	69	10	66
Nigeria	310	34.1 (1992/93)	55	39	48
Peru	2,390	49.0 (1997)	71	8	16
Sri Lanka	820	35.3 (1990/91)	76	38	12
Tunisia	2,100	14.1 (1990)	74	9	42

Source: World Bank 2000.

CHOICES OF POVERTY THRESHOLD

TOPIC 053: WHAT IS POVERTY LINE?

Assume we have chosen a measure of household well-being, say, consumption expenditure. The next step is to choose a poverty line. Households whose consumption expenditure falls below this line are considered poor.

- The minimum expenditure required to fulfill basic needs.
- The threshold consumption needed for a household to escape poverty.
- Somewhat arbitrary because the line between poor and non-poor can be hard to define.

The Poverty and Shared Prosperity series provides a global audience with the latest and most accurate estimates on trends in global poverty and shared prosperity. The 2018 edition “Piecing Together the Poverty Puzzle” broadens the ways we define and measure poverty.

- It introduces a multi-dimensional poverty measure that is anchored on household consumption and the international poverty line of \$1.90 per person per day but broadens the measure by including information on access to education and basic infrastructure.
- If a person earns below than \$1.90 per day, then he will be considered as poor.

TOPIC 054: POVERTY LINE FOR HOUSEHOLD

As per Ravallion (1998), the poverty line for a household, z_i , may be defined as the minimum spending or consumption (or income, or other measure) needed to achieve at least the minimum utility level u_z , given the level of prices (p) and the demographic characteristics of the household (x), so

$$z_i = e(p, x, u_z)$$

There are two approaches to compute poverty line:

- A poverty line for each household, adjusting it from household to household to take into account differences in the prices they face and their demographic composition.

Example: A small household in a rural area may face low housing costs and relatively modest food prices. Thus, their z_i may be lower compared with a large household in a city where housing is more expensive and food prices are perhaps higher. This gives a different poverty line for each household.

- A second and more widely used approach is to construct one per capita poverty line for all individuals, but to adjust per capita expenditure (or income) y_i for differences in prices and household composition. The adjusted per capita y_i is then compared with the poverty line to determine if the individual is living below the poverty line. With this approach, it is easier to talk of “the poverty line” and present it as a single number.

TOPIC 055: RELATIVE POVERTY

Relative poverty is defined in terms of the society in which a person lives. It applies to wealthy, developed countries such as the UK. A ‘minimum income standard’ is set, beneath which a person is said to be living in poverty.

‘Households below Average Income’ is a government report which is published regularly. This report measures level of poverty in the UK, based on the number of people living on an income of below 60 per cent of the average national income.

TOPIC 056: ABSOLUTE POVERTY

Absolute poverty refers to a set standard which is the same in all countries and which does not change over time. An income-related example would be living on less than \$X per day.

This term is used to describe the type of poverty experienced in very poor, lesser developed countries. This could be when people are living on very little money to survive, for example \$1/2 per day. In the United Kingdom nobody lives on incomes this low. So, does absolute poverty exist in the UK? In recent years the government has defined absolute poverty as households living on half the average national income.

TOPIC 057: EXAMPLE; THE \$1 PER DAY AS STANDARD

Cross-country comparisons of poverty rates are notoriously difficult (see chapter 10), but Shaohua Chen and Martin Ravallion (2008) of the World Bank have tried to get around this problem by computing the proportion of the population in different countries living on less than US\$1.25 per person per day (in 2005 U.S. dollars). This line refers to the poverty line used by the 15 poorest countries in their sample, converted to U.S. dollars using the most recent measures of purchasing power parity. The numbers shown in the table below suggest that the poverty rate in Vietnam compares favorably with that of India and is falling rapidly, but lags behind (more affluent) China.

Country	Percentage of population living on less than \$1.25/day	Year	Country	Percentage of population living on less than \$1/day	Year
China, rural	26	2005	Indonesia, rural	24	2005
China, urban	2	2005	Indonesia, urban	19	2005
India, rural	44	2004/05	Philippines	23	2006
India, urban	36	2004/05	Vietnam	50	1998
Nigeria	64	2003	Vietnam	22	2006

Source: PovCalNet (accessed November 11, 2008).

TOPIC 058: ISSUES IN CHOOSING POVERTY LINE; DECIDE THE STANDARD OF LIVING

This is very critical point in choosing the appropriate poverty line and globally we have different poverty line as;

- Food Poverty Line (FPL)
- Cost of Basic Needs (CBN) Approach
- US\$ 1.90 /day
- Multidimensional Poverty Index (MPI)
- Human Development Index (HDI)
- Human Poverty Index (HPI)
- Happiness Index
- Poverty of Opportunities Index (POPI)

TOPIC 059: DATA ON ABSOLUTE VS RELATIVE POVERTY RATES IN DIFFERENT REGIONS OF THE GLOBE

Region	Percentage of population living on less than \$1/day (in 1998)	Percentage of population living on less than one-third of average national consumption for 1993 (in 1998)
East Asia and Pacific	15.3	19.6
East Asia and Pacific excluding China	11.3	24.6
Europe and Central Asia	5.1	25.6
Latin America and the Caribbean	15.6	51.4
Middle East and North Africa	1.9	10.8
South Asia	40.0	40.2
Sub-Saharan Africa	46.3	50.5
Total	24.0	32.1
Total excluding China	26.2	37.0

Source: World Bank 2000.



POVERTY LINES IN PAKISTAN

TOPIC 060: OBJECTIVE POVERTY LINES; THE COST OF BASIC NEEDS METHO

- **Objective poverty lines:**

The strengths and weaknesses of defining poverty lines based on three methods:

- The cost of basic needs.
- Food energy intake.
- Subjective evaluations.

The cost of basic needs (CBN) approach

This approach is most commonly used. It first estimates the cost of acquiring enough food for adequate nutrition—usually 2,100 Calories per person per day—and then adds the cost of other essentials such as clothing and shelter.

The most satisfactory approach to building up a poverty line, while remaining in the spirit of trying to ensure that the line covers basic needs, proceeds as follows:

- Stipulate a consumption bundle that is deemed to be adequate, with both food and nonfood components.
- Estimate the cost of the bundle for each subgroup (urban or rural, each region, and so forth).

TOPIC 061: POVERTY LINES IN PAKISTAN

Pakistan has determined its poverty line and poverty estimation methodology in 2001 based on the consumption data of 1998-99. Headcount poverty in Pakistan is estimated using Pakistan Household Integrated Economic Survey data on the basis of food energy intake (FEI) method as is the case with many developing countries. Planning Commission estimated official poverty line at Rs. 637.54 per person per month at 1998-99 prices on the basis of a threshold level of consuming minimum 2350 kcal/day. The poverty lines thereafter, updated for each successive survey period to incorporate the inflation impact between two survey periods. This methodology uses 1998-99 consumption basket and regress overall expenditure of the lowest 60 percent of population on minimum calories (2350 kcal/day). after 2015, The Poverty and Shared Prosperity series provides a global audience with the latest and most accurate estimates on trends in global poverty and shared prosperity. The 2018 edition “Piecing Together the Poverty Puzzle” broadens the ways we define and measure poverty. It introduces a multi-dimensional poverty measure that is anchored on household consumption and the international poverty line of \$1.90 per person per day but broadens the measure by including information on access to education and basic infrastructure.

TOPIC 062: PAKISTAN POVERTY BASKETS, MONETARY VALUE AND POVERTY LINES

Food items (g)	Age between 2 to under 5 years (N = 59)	Age between 5-9 years (N = 25)	Adolescent girl (10-17 years) (N = 31)	Adult female (18 year and above) (N= 63)	Lactating mother (N = 36)
Total	437.65	471.4	649.4	734.8	727.0
Cereals	147.50	180.4	257.4	280.0	290.8
Rice	136.20	174.7	235.1	264.0	258.0
Wheat	6.00	1.0	8.5	12.0	23.8
Others	5.30	4.7	13.8	4.0	9.0
Root and tuber	53.50	65.8	105.2	135.1	126.3
Potatoes	53.50	65.8	105.2	135.1	126.3
Vegetables	136.80	147.8	214.6	231.1	232.2
Leafy vegetables	53.30	29.2	50.7	41.3	56.0
Yellow vegetables	34.50	50.5	45.4	86.3	93.4
Others	49.00	38.1	118.5	103.5	82.8
Pulses	7.30	4.5	18.5	12.3	13.5
Meat, poultry, eggs	8.15	2.5	4.1	4.2	4.7
Mutton	0.00	0.0	0.0	0.0	0.0
Beef	1.75	0.4	0.0	0.8	0.0
Chicken/duck	1.00	0.0	0.0	0.0	0.0
Eggs	5.40	2.1	4.1	3.4	4.7
Others	0.00	0.0	0.0	0.0	0.0
FISH	12.70	23.7	14.1	30.5	23.3
Milk/milk prod	23.00	18.4	9.7	7.1	12.1
Edible oils	8.00	6.8	7.6	7.4	7.8
Fruits	4.50	0.6	2.5	0.0	0.0
Sugar	3.70	1.3	1.2	1.5	2.1
Miscellaneous	32.50	19.6	14.5	25.6	14.2

Poverty Bands	Percentage of Population		
	National	Urban	Rural
Extreme Poor (< 50% of Poverty Line)	0.42	0.21	0.54
Ultra Poor (> 50% and < 75% of Poverty Line)	6.00	2.39	7.95
Poor (> 75% and < 100% of Poverty Line)	17.89	9.93	22.18
Vulnerable (> 100% and < 125% of Poverty Line)	19.87	14.46	22.78
Quasi Non-Poor (> 125% and < 200% of Poverty Line)	34.77	37.68	33.21
Non-Poor (> 200% of Poverty Line)	21.04	35.33	13.34
Total Population	100	100	100

TOPIC 063: FOOD ENERGY INTAKE METHOD FOR POVERTY LINE

When price information is unavailable food energy intake method can be used. This method plots expenditure (or income) per capita against food consumption (in calories per person per day) to determine the expenditure (or income) level at which a household acquires enough food. The basic needs approach outlined above requires information on the prices of the goods that the poor consume, especially when making comparisons across regions or over time. When price data are not available, a number of researchers have used an alternative method to construct the poverty line—the food energy intake method. As before, the goal here is to find the level of consumption expenditure (or income) that allows the household to obtain enough food to meet its energy requirements.

Note that consumption will include nonfood as well as food items; even underfed households typically consume some clothing and shelter, which means that at the margin these “basic needs” must be as valuable as additional food.

TOPIC 064: POVERTY LINE ASSESSMENT, ABSOLUTE VS RELATIVE

Absolute (17 cases)

Calorie requirement (12)

Calories only

Calorie cost/food share (1)

Calories + basket of goods (5)

Basket of goods (including food) (5)

Relative (23 cases)

Relative to income base

Multiple of wage

Share of mean income or expenditure (11)

Specified percentage of income distribution (11)

Source: Hanman, Pyatt, and White 1999.

TOPIC 065: PER CAPITA DAILY CALORIE INTAKE AND POVERTY LINE

First one needs to determine the amount of food that is adequate. Vietnam pegs this level at 2,100 calories per person per day, in line with UN Food and Agriculture Organization recommendations, but it is recognized that individuals may need more or less food than this. Clearly, the needs of young children, growing teenagers, manual workers, pregnant women, or sedentary office workers may differ quite markedly; physical stature also plays a role. Not all countries have set the same cutoff point, as table 3.8 shows.

Table 3.8 Per Capita Daily Calorie Intake Used in Poverty Line Construction

	Years	Urban	Rural
Bangladesh	1996–99	2,112	2,122
India	1993–95	2,100	2,400
Indonesia	1990, 1999	2,100	2,100
Laos	1995	2,100	2,100
Pakistan	1992–93, 1996–97	2,295	2,550
Thailand	1990, 1998	2,100	2,100
Vietnam	1993, 1998	2,100	2,100

Source: www.idrc.ca/uploads/user-S/10282146370mimap60.doc [accessed July 16, 2008].

Note: Thailand now uses Calorie levels that are differentiated by age and gender; for instance, for adults ages 31–50, 2,100 Calories for men and 1,750 Calories for women.

POVERTY MEASUREMENT

TOPIC 066: FOOD ENERGY INTAKE METHOD, DEMERITS

First one needs to determine the amount of food that is adequate. In Vietnam, 2,100 calories per person per day, in line with UN Food and Agriculture Organization recommendations, but it is recognized that individuals may need more or less food than this, based on age, working conditions, women status and physical activity.

Not all countries have set the same cutoff point.

TOPIC 067: RURAL-URBAN PROBLEMS IN POVERTY LINE IDENTIFICATION

The Urban-Rural Problem.

Rural	Urban
Rural households can obtain food more cheaply, both because food is typically less expensive	Urban consumers are more likely to buy higher quality foodstuffs, which raises the cost per calorie
Rural areas and also because they are more willing to consume foodstuffs that are cheaper per calorie (such as cassava rather than rice)	The calorie income function for rural household's will typically be higher than that for urban households.

The implication is that for a given level of food energy intake, the poverty line in the rural area will be lower than in the urban area.

TOPIC 068: RELATIVE PRICE PROBLEM IN MEASURING POVERTY

When researchers tried to apply the food energy intake approach to data from the Vietnam Living Standards Survey of 1998, the method failed. As with the 1993 data, the idea was to compute food expenditure functions, find the cost of 2,100 Calories of food, and calculate the related level of expenditure per capita, which would then serve as a poverty line. After undertaking this exercise, researchers found a higher level of poverty in 1998 than in 1993, an implausible result in an economy whose real GDP grew by 9 percent annually between 1993 and 1998, and where there was a general sense that the benefits of this growth had spread widely.

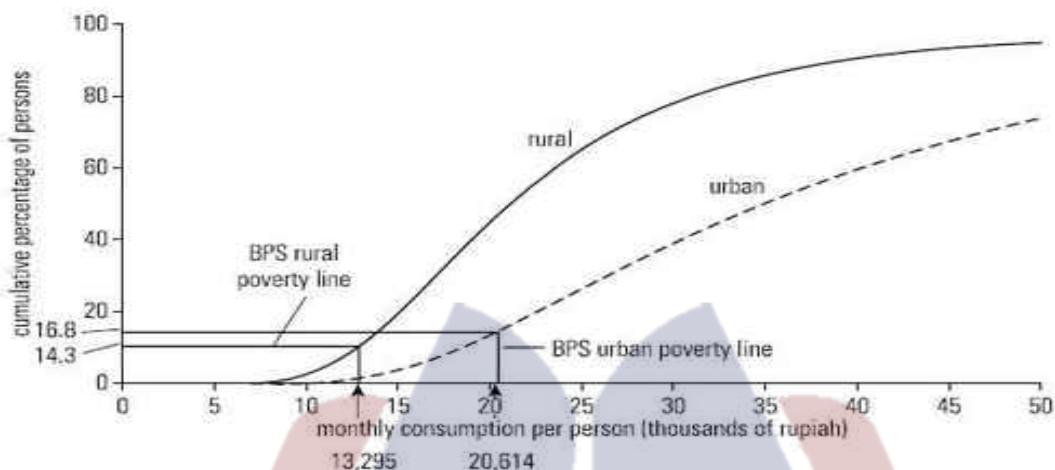
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Table 3.10 Poverty Lines in Indonesia Using Food Energy Intake Method, 1990

Poverty measure	Indonesia overall	Urban areas	Rural areas
P_0 (%)	15.1	16.8	14.3
P_1 (%)	2.42	3.23	1.06
P_2 (x 100)	0.66	0.94	0.53

Source: Ravallion and Bidani 1994.

Figure 3.5 Cumulative Distribution Functions for Consumption, Indonesia, 1990



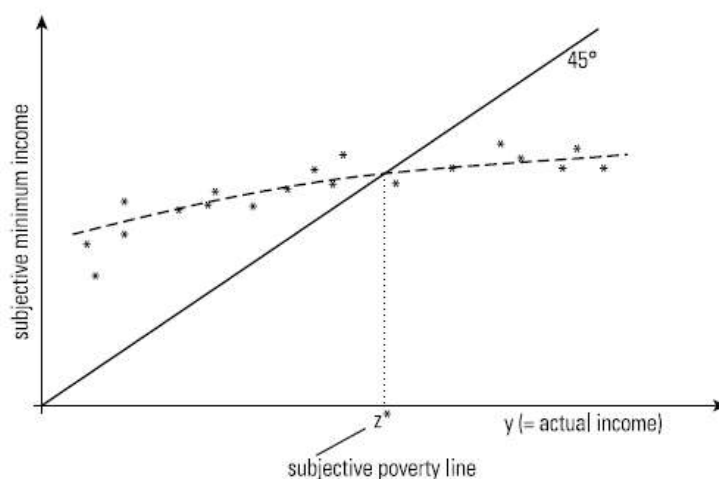
TOPIC 069: SUBJECTIVE POVERTY LINES

Subjective poverty lines are based on asking people what minimum income level is needed just to make ends meet.

We could measure poverty by asking people to define a poverty line, and using this to measure the extent of poverty. For instance, in a survey one might ask "What income level do you personally consider to be absolutely minimal? That is to say, with less you could not make ends meet".

The answers will vary from person to person (and by size of household), but they could be plotted, and a line fitted through them, to get a subjective poverty line such as z^* in figure 3.7. It may also be possible to get adequate results by asking "do you consider your current consumption to be adequate to make ends meet?"

Figure 3.7 Estimating a Subjective Poverty Line



TOPIC 070: POVERTY MEASUREMENT

A number of aggregate measures of poverty can be computed. The formulas presented in this chapter are all based on the assumption that the survey represents a simple random sample of the population, which makes them relatively easy to understand. Where the sampling is more complex the typical situation in practice weighting is needed, and the relevant formulas and associated programming are somewhat more difficult, but can be handled fairly easily by most major statistical packages such as Stata, SPSS, and SAS.

TOPIC 071: HEAD COUNT INDEX OR INCIDENCE OF POVERTY

The headcount index (P_0) measures the proportion of the population that is poor. It is popular because it is easy to understand and measure. But it does not indicate how poor the poor are.

$$P_0 = N_p / N$$

Where N_p is number of poor living below the poverty line and N in total population. Head count ratio gives us the percentage of poor in the total population only.

TOPIC 072: DEMERITS OF HEAD COUNT RATION

Example

If 60 people are poor in a survey that samples 300 people, then $P_0 = 60/300 = 0.2 = 20$ percent. However, the measure has at least three weaknesses:

- First, the headcount index does not take the intensity of poverty into account.
- Second, the headcount index does not indicate how poor the poor are, and hence does not change if people below the poverty line become poorer
- Third, the poverty estimates should be calculated for individuals, not households.

INDICES USED IN POVERTY MEASUREMENT-I

TOPIC 073: POVERTY GAP INDEX

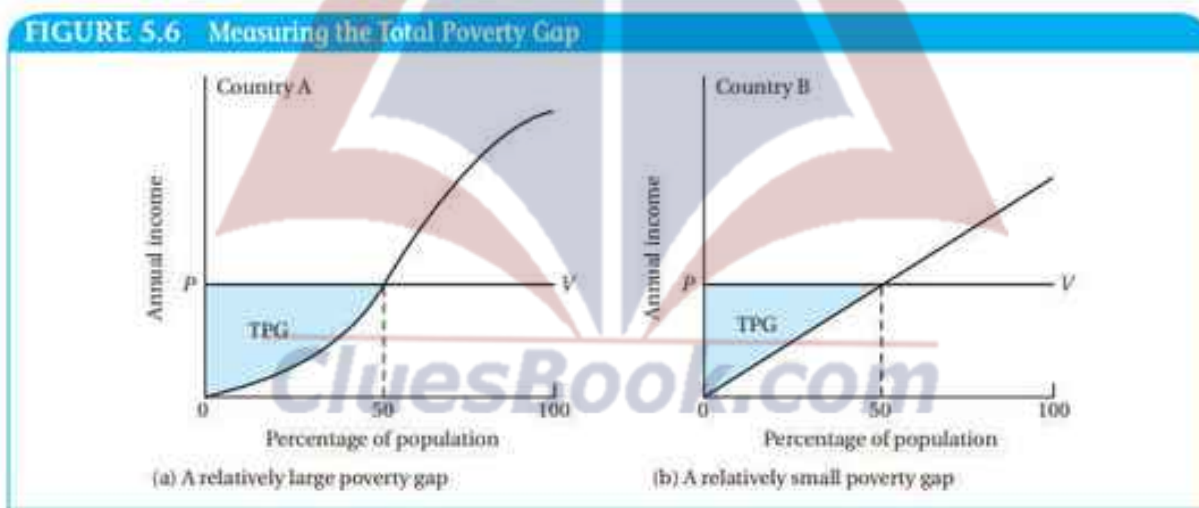
- The poverty gap index (P1) measures the extent to which individuals fall below the poverty line (the poverty gaps) as a proportion of the poverty line.
- The sum of these poverty gaps gives the minimum cost of eliminating poverty, if transfers were perfectly targeted.
- The measure does not reflect changes in inequality among the poor.

$$P_1 = \frac{1}{N} \sum_{i=1}^N \frac{G_i}{z}$$

- Poverty gap (G_i)
- Poverty line (z)
- Less actual income (y_i)

TOPIC 074: GRAPHICAL PRESENTATION OF POVERTY GAP INDEX

Figure 5.6 shows two case studies for Country A and B. Head count poverty is same i.e 50percent while poverty gap is higher in Country A as compared with B, as shown in shaded area.



TOPIC 075: USE OF POVERTY GAP INDEX IN PRO-POOR POLICY DESIGN

On the basis of poverty gap statistics, Institutions and Governments can take decisions of subsidies, support in income, social safety nets, provision of basic needs, tax incentives, etc. Higher Poverty Gap indicates that high level of government support is desired for accessing the poverty line and vice versa.

TOPIC 076: SQUARED POVERTY GAP OR SEVERITY OF POVERTY

The squared poverty gap index (also known as the poverty severity index, P2) averages the squares of the poverty gaps relative to the poverty line.

To construct a measure of poverty that takes into account inequality among the poor, some researchers use the squared poverty gap index. This is simply a weighted sum of poverty gaps (as a proportion of the poverty line), where the weights are the proportionate poverty gaps themselves; a poverty gap of, say, 10 percent of the poverty line is given a weight of 10 percent while one of 50 percent is given a weight of 50 percent; this is in contrast with the poverty gap index, where the gaps are weighted equally. Hence, by squaring the poverty gap index, the measure implicitly puts more weight on observations that fall well below the poverty line. Formally,

$$P_2 = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z} \right)^2.$$

Calculating the Poverty Gap Index, Assuming Poverty Line of 125

	Expenditure for each individual in country				Squared poverty gap index (P_2)
Expenditure in country C	100	110	150	160	
Poverty gap	25	15	0	0	
G_i/z	0.20	0.12	0	0	
$(G_i/z)^2$	0.04	0.0144	0	0	0.0136 [= 0.0544/4]

TOPIC 077: FOSTER-GREER-THORBECK POVERTY MEASURES

It is one of the Foster-Greer-Thorbeck (FGT) class of poverty measures that allow one to vary the amount of weight that one puts on the income (or expenditure) level of the poorest members in society. The FGT poverty measures are additively decomposable. It is also possible to separate changes in the FGT measures into a component resulting from rising average incomes, and a component resulting from changes in the distribution of income.

$$P_\alpha = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z} \right)^\alpha, \quad (\alpha \geq 0),$$

where α is a measure of the sensitivity of the index to poverty and the poverty line is z , the value of expenditure per capita for the i th person's household is x_i , and the poverty gap for individual i is $G_i = z - x_i$ (with $G_i = 0$ when $x_i > z$). When parameter $\alpha = 0$, P_0 is simply the headcount index. When $\alpha = 1$, the index is the poverty gap index P_1 , and when α is set equal to 2, P_2 is the poverty severity index. For all $\alpha > 0$, the measure is strictly decreasing in the living standard of the poor (the higher one's standard of living, the less poor one is deemed to be). Furthermore, for $\alpha > 1$ the index also has the property that the increase in measured poverty because of a fall in one's standard of living will be deemed greater the poorer one is. The measure is then said to be "strictly convex" in incomes (and "weakly convex" for $\alpha = 1$).

TOPIC 078: SEN INDEX OF POVERTY MEASURE

Sen (1976) proposed an index that seeks to combine the effects of

- The number of poor.
- The depth of their poverty.
- The distribution of poverty within the group.

$$P_s = P_0 \left(1 - (1 - G^p) \frac{\mu^p}{z} \right),$$

Where, P_0 is the headcount index, μ^p is the mean income (or expenditure) of the poor, and G^p is the Gini coefficient of inequality among the poor.

- The Sen index can also be written as the average of the headcount and poverty gap measures, weighted by the Gini coefficient of the poor

$$P_s = P_0 G^p + P_1 (1 - G^p)$$

- It can be shown (Xu and Osberg 2002) that the Sen index may also be written as

$$P_s = P_0 P_1^p (1 + G^{pp}),$$

Where, G^{pp} is the Gini coefficient of the poverty gap ratios of only the poor and P_1^p is the poverty gap index calculated over poor individuals only.



INDICES USED IN POVERTY MEASUREMENT-II

TOPIC 079: SEN-SHORROCKS-THON INDEX FOR POVERTY MEASURE

It is defined as:

$$P_{SST} = P_0 P_1^P (1 + \hat{G}^P),$$

Which is the product of the headcount index, the poverty gap index (applied to the poor only), and a term with the Gini coefficient of the poverty gap ratios (that is, of the G_n 's) for the whole population. This Gini coefficient typically is close to 1, indicating great inequality in the incidence of poverty gaps.

Example: In 1996, 12.4 percent of the population of Quebec province (Canada) was in poverty. The poverty gap index, applied to the poor only, stood at 0.272. And the Gini coefficient of the poverty gap ratios was 0.924. Thus the SST index was $0.065 = (0.124 \times 0.272 \times (1 + 0.924))$.

TOPIC 080: THE WATTS INDEX FOR POVERTY MEASURE

The first distribution-sensitive poverty measure was proposed in 1968 by Watts (see Zheng 1993), and in its discrete version takes the form

$$W = \frac{1}{N} \sum_{i=1}^q [\ln(z) - \ln(y_i)] = \frac{1}{N} \sum_{i=1}^q \ln\left(\frac{z}{y_i}\right),$$

Where, the N individuals in the population are indexed in ascending order of income (or expenditure), and the sum is taken over the q individuals whose income (or expenditure) y_i falls below the poverty line z .

The Watts index is computed, by dividing the poverty line by income, taking logs, and finding the average over the poor. Although it is not a particularly intuitive measure, the Watts index is increasingly used by researchers because it satisfies all the theoretical properties that one would want in a poverty index. Ravallion and Chen (2001) argue that three axioms are essential to any good measure of poverty. Under the focus axiom, the measure should not vary if the income of the non-poor varies; under the monotonicity axiom, any income gain for the poor should reduce poverty; and under the transfer axiom, inequality-reducing transfers among the poor should reduce poverty. The Watts index satisfies these three axioms, but the headcount (P_0) and poverty severity (P_1) measures do not.

TOPIC 081: CALCULATING THE WATTS INDEX

Calculating the Watts Index, Assuming Poverty Line of 125

	Expenditure for each individual in country				Watts index
<i>Case 1 (poor)</i>					
Expenditure in country C	100	110	150	160	
z/y_i	1.25	1.14	0.83	0.78	
$\log(z/y_i)$	0.223	0.128	-0.182	-0.247	0.088
<i>Case 2 (less poor)</i>					
Expenditure in country C	110	120	150	160	
z/y_i	1.14	1.04	0.83	0.78	
$\log(z/y_i)$	0.128	0.041	-0.182	-0.247	0.042
<i>Case 3 (deeper poverty)</i>					
Expenditure in country C	90	120	150	160	
z/y_i	1.25	1.10	0.83	0.78	
$\log(z/y_i)$	0.329	0.041	-0.182	-0.247	0.092

TOPIC 082: COMPARISON OF POVERTY MEASURES IN DIFFERENT COUNTRIES

Table 4.3 Measures of Poverty (with a \$2/day Poverty Line) and Inequality for Selected Countries and Regions

	Year	Mean per month ^a	P_0 (%)	P_1 (%)	$P_2 \times 100$	Watts	Gini	Mean log deviation
Nigeria	2003	39	83.9	46.9	30.78	0.838	0.429	0.320
India, rural	2004/5	50	79.5	30.9	14.66	0.429	0.305	0.160
Uganda	2005	53	75.6	36.4	21.12	0.581	0.426	0.305
India, urban	2004/5	62	65.8	26.0	12.90	0.378	0.376	0.233
Haiti	2001	64	72.1	41.8	28.98	0.812	0.595	0.675
Senegal	2005	67	60.3	24.6	12.96	0.374	0.392	0.259
China, rural	2005	71	55.6	19.5	8.92	0.274	0.359	0.213
Vietnam	2006	83	48.4	16.2	7.04	0.223	0.378	0.234
Armenia	2003	84	43.4	11.3	4.13	0.143	0.338	0.198
South Africa	2000	153	42.9	18.3	9.66	0.273	0.578	0.605
China, urban	2005	162	9.4	2.1	0.81	0.029	0.348	0.209
Guatemala	2006	200	24.3	8.9	4.43	0.129	0.537	0.525
Peru	2005	224	19.4	6.3	2.68	0.088	0.520	0.484
Paraguay	2005	257	18.4	7.3	4.06	0.108	0.539	0.546
Mexico	2006	330	4.8	1.0	0.31	0.012	0.481	0.405

Source: World Bank, PovcalNet, accessed November 4, 2008.

Note: P_0 is the headcount poverty rate; P_1 is the poverty gap index; and P_2 is the poverty severity index. The poverty line is set at US\$2 per day (\$60.8 per month).

a. Mean monthly expenditure (or income) per capita in 2005 purchasing power parity US\$.

TOPIC 083: TIME TAKEN TO EXIT FROM POVERTY

When thinking about poverty reduction strategies, it may be useful to show how long it would take, at different potential economic growth rates, for the average poor person to exit poverty.

A poverty statistic with this property was derived by Morduch (1998); the statistic is decomposable by population subgroups and is also sensitive to the distribution of expenditure (or income) among the poor. For the j th person below the poverty line, the expected time to exit poverty (that is, to reach the poverty line), if consumption per capita grows at positive rate g per year, is

$$t_g^j \approx \frac{\ln(z) - \ln(x_j)}{g} = \frac{W}{g}.$$

Thus, the time taken to exit is the same as the Watts index divided by the expected growth rate of income (or expenditure) of the poor.



ERRORS IN POVERTY MEASUREMENT

TOPIC 084: ERRORS IN MEASURING POVERTY

- First is sampling error, which arises because we are trying to measure the poverty rate for the country as a whole on the basis of information from a relatively modest number of households.
- Second, there is likely to be measurement error, so that our measures of poverty are inherently imprecise.
- Third, there are unknown differences in needs between households at similar consumption levels, yet considerable arbitrariness in the way in which equivalence scales are used to address this problem.
- Fourth is uncertainty and arbitrariness about both the poverty line and the precise poverty measures used.

TOPIC 085: SAMPLING ERROR

Suppose one wants to determine the average per capita expenditure level in a country. It is unrealistic to measure everyone's expenditure, so pick a simple random sample of individuals and measure their expenditure. The average expenditure for those sampled (the sample mean,) is found to be \$652 per year. For now, this is the best estimate of the average per capita expenditure for all people in the population. But if another simple random sample were to be taken, it would almost certainly yield a slightly different sample mean, \$655 for instance. In other words, the sample mean is a random variable; to the extent that it only approximates the true mean expenditure per capita of the population, we have a degree of sampling error.

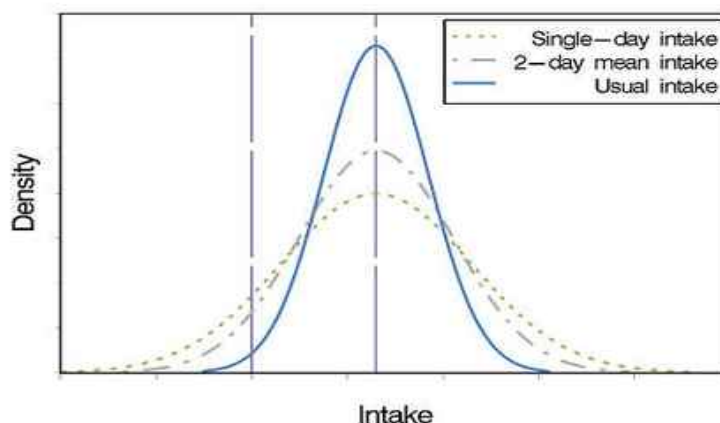
TOPIC 086: MEASUREMENT ERROR

Measurement error is the difference between a measured value of a quantity and its true value. In statistics, an error is not a "mistake". Variability is an inherent part of the results of measurements and of the measurement process.

Measurement errors can be divided into two components: random error and systematic error

- Random errors are errors in measurement that lead to measurable values being inconsistent when repeated measurements of a constant attribute or quantity are taken. Systematic errors are errors that are not determined by chance but are introduced by an inaccuracy (involving either the observation or measurement process) inherent to the system.
- Systematic error may also refer to an error with a non-zero mean, the effect of which is not reduced when observations are averaged

Figure 2: The effect of purely random error on population distribution



TOPIC 087: EQUIVALENCE SCALES

Poverty studies usually measure living standards using expenditure (or income) per capita. because needs vary among household members, and because there are economies of scale in consumption, poverty measures based on per capita welfare indicators may not be good estimates. An alternative is to base our poverty measures on expenditure (or income) per adult equivalent. If poverty estimates are not affected by the adult equivalence weights that we choose, it is safe to say that those poverty estimates are not biased as a consequence of the weighting procedure used.

Table 5.1 Sensitivity of Headcount Poverty Rate (P_0) to Different Specifications of Adult Equivalence Scales, United States, 1999

Adult equivalence scale used	Headcount poverty rate, %
$N_a + N_c$ (that is, use income per capita)	13.3
$(N_a + 0.7 N_c)^{0.65}$	13.1
$(N_a + 0.7 N_c)^{0.70}$	12.3
$(N_a + 0.7 N_c)^{0.75}$	12.7
$(N_a + 0.7 N_c)^{0.85}$	13.4
$(N_a + 0.7 N_c)^{0.9}$	12.7
$(N_a + 0.85 N_c)^{0.65}$	12.7
$1 + 0.4(N_a - 1) + 0.4(\text{child } 1) + 0.3(N_c - 1)$ (Canadian scale)	13.8
One adult: 1. Two adults: 1.41. Single parents: $(N_a + 0.8 + 0.5N_c - 1)$.	
All other families: $(N_a + 0.5N_c)^{0.7}$	13.1

Source: Short et al. 1999.

Note: N_a = Number of adults. N_c = Number of children.

TOPIC 088: CHOICE OF POVERTY LINE AND POVERTY MEASURES

- The choice of a poverty line and associated poverty rate (for example, headcount index, and poverty gap index) is arbitrary. Sometimes, although not always, these choices matter.
- By comparing the cumulative distribution function of expenditure (or income) per capita sometimes called the poverty incidence curve—between two situations, one may judge whether the choice of poverty line affects the conclusion about the change in poverty.

- If there is first order stochastic dominance, the choice of poverty line is not crucial; otherwise it is often possible to use higher-order tests (for example, second-order stochastic dominance) to help reach a clear conclusion about whether poverty differs between two time periods (or regions or countries).

Table 5.4 Classifying the Poor Using Alternative Measures of Welfare, Vietnam, 2006

	Percentages					Number of observations
	OECD expenditure		Economies of scale expenditure		Total	
	Not poor	Poor	Not poor	Poor		
Expenditure per capita						
Not poor	78.4	1.6	77.8	2.2	80.0	7,351
Poor	1.6	18.4	2.2	17.8	20.0	1,838
Total	80.0	20.0	80.0	20.0	100.0	
Number of observations	7,351	1,838	7,350	1,839		

TOPIC 089: STANDARD OF LIVING MEASUREMENT

A natural extension of the idea of checking the effect of different poverty lines on the poverty rate is to look at the entire distribution, using the theory of stochastic dominance. Ravallion (1998) provides a clear exposition,

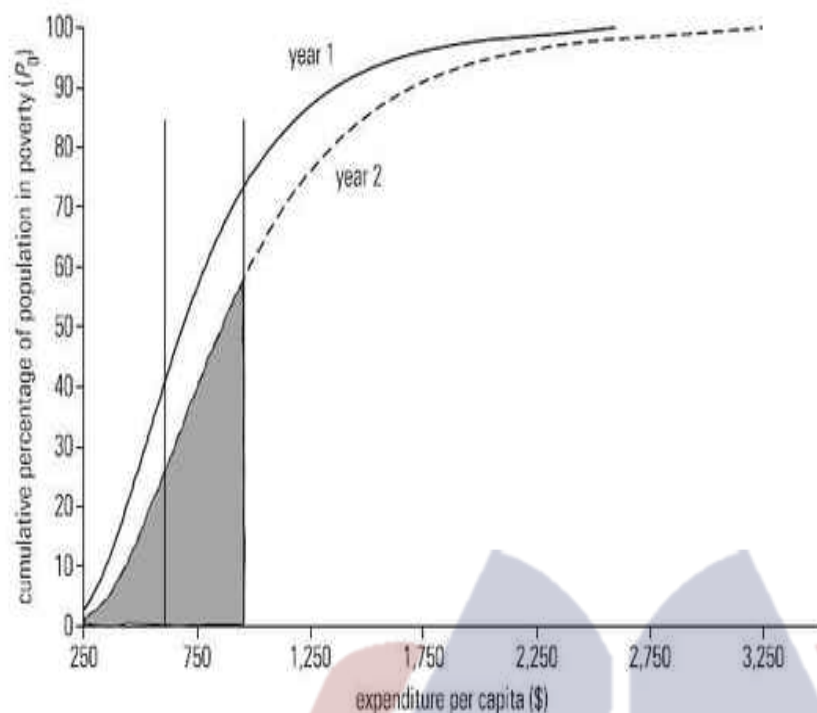
Table 5.5 Sensitivity of Poverty Rate in Vietnam to Changes in the Poverty Line, 2006

	Poverty rate (%)	Standard error of estimate of the poverty rate (%)
Poverty line + 10 percent	21.2	0.76
Poverty line + 5 percent	18.9	0.74
Poverty line	16.6	0.69
Poverty line – 5 percent	14.6	0.65
Poverty line – 10 percent	12.6	0.60

Source: VHLSS06.

Note: Based on observations of 9,189 households. The poverty rates have been adjusted for stratification (64 provinces and cities) and clustering (630 primary sampling units).

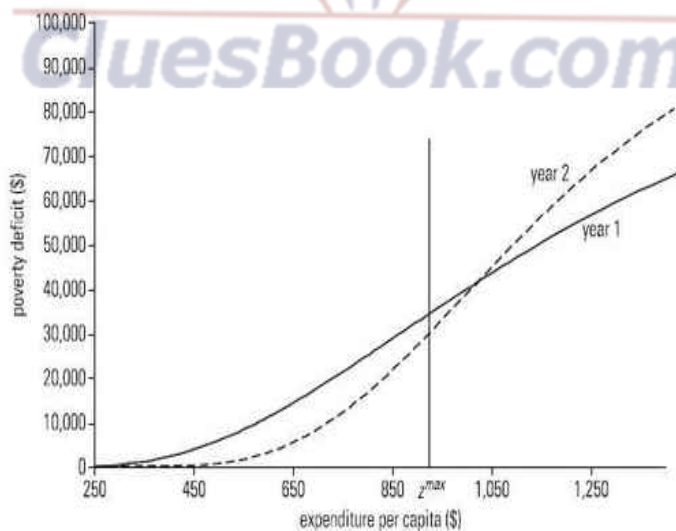
Figure 5.2 Poverty Incidence Curves with First-Order Stochastic Dominance



In figure 5.2, the ranking was unambiguous, using a poverty line of \$600, poverty is higher in year 1; but with a poverty line of \$1,000, poverty is higher in year 2 (as measured by the headcount index). In this case it is not at all clear whether poverty has risen or fallen.

TOPIC 090: POVERTY DEFICIT CURVES

Figure 5.3 Poverty Deficit Curves



TOPIC 091: ROBUSTNESS IN POVERTY MEASURE

- We have assumed that the poverty line applicable to each household is measured correctly, so that we have an accurate appreciation of the needs of different people. However, these needs may themselves vary in an unknown way some people need more food, or special medicine, which would increase the resources they would need to avoid being poor. We may think of this as equivalent to knowing the poverty line only imperfectly, and ask what would happen if the poverty line itself were subject to error.
- When the poverty line is best considered as a random variable, the true poverty rate will, under plausible conditions, likely be higher than the rate that is measured based on the survey data.
- Sometimes we might recognize that needs differ in some systematic way for instance, we might believe that rural households need more food than urban households but are not sure how to compare needs between these groups. In this case, it is difficult to apply a test for first-order dominance globally. However, we may be able to apply the test separately for rural and for urban households; if first order dominance applies for each group separately, it turns out that it will also hold in the aggregate, as long as we are using additive poverty measures (such as the headcount or poverty gap measures).
- More general tests can be devised for a large variety of situations, but many are difficult to explain non-mathematically and so are unlikely to be convincing to policy makers.
- When making poverty comparisons, or even when reporting on poverty at a single time, it is important to examine the robustness of the results; sometimes estimated poverty rates can be surprisingly fragile.



INEQUALITY, TYPES AND SOCIAL DIMENSIONS OF INEQUALITY**TOPIC 092: CONCEPT OF INEQUALITY**

No society can surely be flourishing and happy, of which by far the greater part of the numbers are poor and miserable.

Adam Smith, 1776 Inequality state of not being equal, especially in status, rights, and opportunities is a concept very much at the heart of social justice theories. However, it is prone to confusion in public debate as it ends to mean different things to different people. Some distinctions are common though. Many authors distinguish “economic inequality”, mostly meaning “income inequality”, “monetary inequality” or, more broadly, inequality in “living conditions”. Others further distinguish a rights-based, legalistic approach to inequality, inequality of rights and associated obligations (e.g. when people are not equal before the law, or when people have unequal political power).

Concerning economic inequality, much of the discussion has boiled down to two views.

- One is chiefly concerned with the inequality of outcomes in the material dimensions of well-being and that may be the result of circumstances beyond one’s control (ethnicity, family background, gender, and so on) as well as talent and effort. This view takes an ex-post or achievement-oriented perspective.
- The second view is concerned with the inequality of opportunities, that is, it focuses only in the circumstances beyond one’s control, that affect one’s potential outcomes. This is an ex-ante or potential achievement perspective.

TOPIC 093: GLOBAL INEQUALITIES

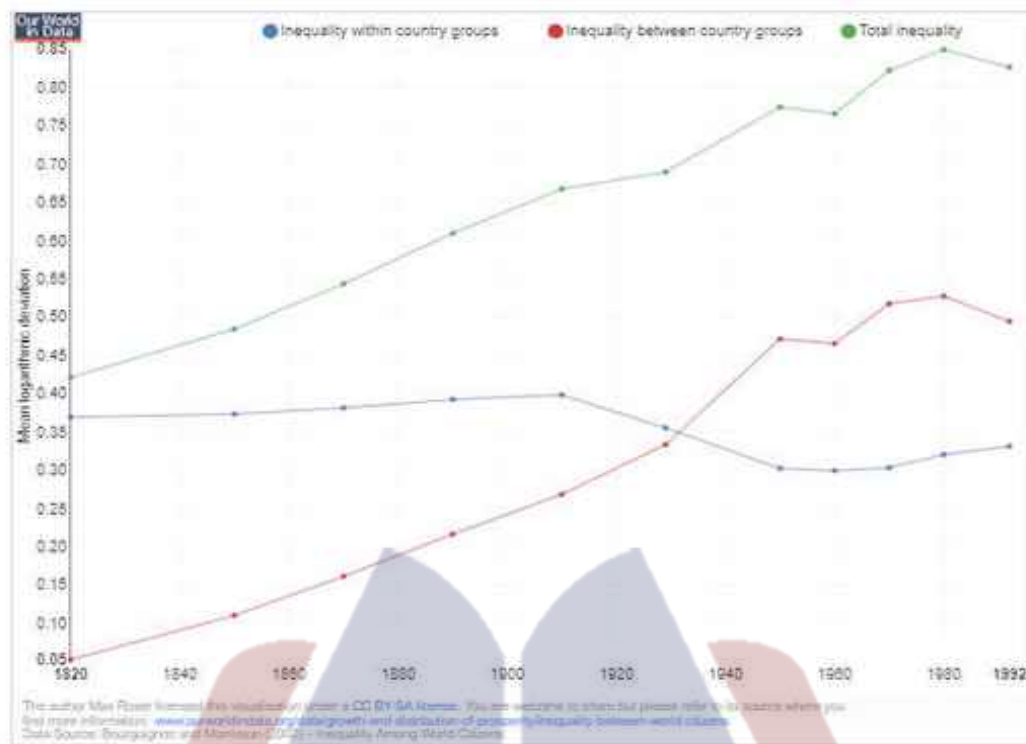
Global Inequality takes us back hundreds of years, and as far around the world as data allow, to show that inequality moves in cycles, fueled by war and disease, technological disruption, access to education, and redistribution. The recent surge of inequality in the West has been driven by the revolution in technology, just as the Industrial Revolution drove inequality 150 years ago. But even as inequality has soared within nations, it has fallen dramatically among nations, as middle-class incomes in China and India have drawn closer to the stagnating incomes of the middle classes in the developed world. A more open migration policy would reduce global inequality even further.

Global inequality is driven by changes both of the inequality within countries and the inequality between countries. The below visualization shows how both of these changes determine the changing global inequality.

- Inequality within countries followed a U-shape pattern over the course of the 20th century.
- Inequality between countries increased over the course of 2 centuries and reached its peak level in the 1980s according to the data from Bourguignon and Morrison shown here. Since then, inequality between countries has declined.

As is shown in the visualization below, the inequality of incomes between different countries is much higher than the inequality within countries. The consequence of this is that the trend of global inequality is very much driven by what is happening to the inequality between countries.

Global inequality between world citizens and its components: 1820-1992¹¹



TOPIC 094: TYPES OF INEQUALITY; HORIZONTAL VS VERTICAL INEQUALITY

Vertical inequality:

- Vertical inequality consists in inequality among individuals or households,
- The nature and extent of vertical inequality is important for a number of reasons:
 - One is that of creating a just society;
 - Secondly, the extent of inequality, for any given national income per capita, determines the level of poverty.
 - Thirdly, happiness tends to be higher in more equal societies (Graham and Pettinato, 2002; Luttmer, 2004)
 - Fourthly, there is evidence that more equal economies grow faster (Alesina and Rodrik, 1994; World Bank, 2006);
 - Fifthly, higher inequality is associated with higher rates of criminality (Bourignon, 2001). Therefore, developing policies to reduce VI is important.

Horizontal inequality:

- Horizontal inequality is defined as inequality among groups, typically culturally defined – e.g. by ethnicity, religion or race.
- Horizontal inequalities, rather than vertical, are particularly important in conflict-prone societies, since there is growing evidence that the nature and level of HIs are important determinants of the risk of violent conflict. Violent conflict in turn undermines development and increases poverty levels (Stewart, 2001; Collier and World Bank, 2003).

TOPIC 95: SOCIAL JUSTICE AND DISTRIBUTIONAL ISSUES

Whether households and neighbors are being treated equally in provision of services, or not.

These measures can be used to indicate imbalances; i.e. doctor uses body temperature/blood pressure as indicators of a patient's health.

Thus, the utility of using measures of social equity is twofold. First, these measures can inform planners of potential imbalances. Second, they can promote public awareness of equity issues.

TOPIC 096: SOCIAL DIMENSIONS OF INEQUALITY (RACE, ETHNICITY, CLASS, GENDER, IMMIGRATION STATUS, DISABILITY, AGE, SEXUAL ORIENTATION AND FAMILY STRUCTURE)

Some of the important aspects of social inequality have already been discussed in Horizontal Inequality.

Main Societal aspects are as; Race, Ethnicity, Class, Gender, Immigration Status, Disability, Age, Family structure and Education.

Social inequality occurs when resources in a given society are distributed unevenly.

It is the differentiation preference of access of social goods in the society brought about by power, religion, kinship, prestige, race, ethnicity, gender, age, and class.

Social inequality linked to economic inequality, usually described on the basis of the unequal distribution of income or wealth, followed by limited access to opportunities.

TOPIC 097: CONTRIBUTIONS OF SEN, RAWLS, NOZICK, NUSSBAUM

John Rawls Philosophy; a person's class of origin can ensure access to resources including wealth and power. These factors are as;

Natural factors: a person may have inherent natural endowments that can be fully exploited given the opportunity.

Fortunate factors: a person may encounter circumstances that limit or enhance access to resources from time to time, such as ill health, unemployment, lottery winning etc.

Amartya Sen developed a capability framework to consider equality, which extends beyond the economic issues of equity.

A person less able in using primary goods to secure freedoms, (e.g. because of disability, illness, biological constraint related to gender) is disadvantaged compared with another more favourably placed in that respect even if both have the same bundle of primary goods.

Robert Nozick applied "Entitlement Theory" in rejecting the concept of government intervention to redistribute resources.

No person/group is entitled to control the resources and decisions.

What each person gets, he gets from others who give to him in exchange for something.

Nozick rejects taxation because a person is forced to work for money to pay taxes which will be reallocated according to some principle, not chosen by the taxpayer

Nussbaum's capability approach: She has focused on following elements for living; Thrilled Life, Bodily health and integrity, Being able to use the senses; being able to imagine, to think, and to reason, Emotions, Practical reasons and Social Interaction

TOPIC 098: BREAKDOWN OF INCOME IN PAKISTAN BY QUINTILES

QUINTILES	AVERAGE MONTHLY HOUSEHOLD INCOME (RS.)					
	2013-14			2015-16		
	URBAN	RURAL	TOTAL	URBAN	RURAL	TOTAL
1 st	17414	16428	16583	20441	19625	19742
2 nd	21744	20015	20436	25292	23392	23826
3 rd	20220	23273	24100	28940	27613	28020
4 th	29225	29275	29255	34407	33170	33688
5 th	57860	46424	53001	65950	52008	60451
TOTAL	30923	26452	30999	45283	30110	35662

Economic Survey 2010-11

Table-13.3: Impact of Food Price Increases on Poverty (\$1.25-a-day poverty line)

	Change in Percentage of Poor (in percentage points) with an Increase in Food Prices by			Change in Number of Poor (in millions) with an Increase in Food Prices by		
	10%	20%	30%	10%	20%	30%
Bangladesh	2.5	5.0	7.5	3.83	7.65	11.48
India Rural	2.9	5.8	8.8	22.82	45.64	69.45
India Urban	2.1	4.3	6.4	6.68	13.36	20.04
Pakistan	2.2	4.5	6.7	3.47	6.94	10.41
Bhutan	1.8	3.5	5.3	0.01	0.02	0.03
Philippines	1.6	3.2	4.9	1.37	2.75	4.12
Sri Lanka	1.2	2.4	3.6	0.24	0.47	0.71
Thailand	0.1	0.2	0.2	0.05	0.10	0.15
Viet Nam	1.9	3.7	5.6	1.55	3.10	4.65

Source: ADB staff calculations using the latest POVCAL database (accessed 18 February 2011).

TOPIC 099: BREAKDOWN OF CONSUMPTION IN PAKISTAN BY QUINTILES

Table13.4: Gini-Coefficient and Consumption Shares by Quintiles

	PIHS 2001-02			HIES 2004-05			PSLM 2005-06			PSLM 2007-08		
	Urban	Rural	Pakistan	Urban	Rural	Pakistan	Urban	Rural	Pakistan	Urban	Rural	Pakistan
Gini Coefficient	0.32	0.23	0.27	0.33	0.25	0.29	0.34	0.24	0.30	0.32	0.25	0.29
Consumption share by Quintile (%)												
Quintile 1	5.3	12.8	10.1	4.8	12.6	9.5	4.5	13.5	9.6	5.0	13.1	9.9
Quintile 2	8.1	16.9	13.7	7.6	17.1	13.2	8.2	16.8	13.1	9.1	16.1	13.3
Quintile 3	12.1	1	16.8	11.6	19.7	16.4	11.1	20.1	16.2	11.7	19.6	16.4
Quintile 4	19.4	22.4	21.3	18.3	23	21.4	17.8	23	20.8	19.6	22.1	21.1
Quintile 5	55.1	28.4	38	57.7	27.6	39.4	58.4	26.6	40.3	54.6	29.1	39.3
Ratio of Highest to Lowest Quintiles	10.4	2.22	3.76	12.0	2.19	4.15	13.0	1.97	4.2	10.9	2.2	4.0

Source: Calculations based on the data of PIHS 2001-02; HIES 2004-05; PSLM 2005-06, 2007-08



INEQUALITY MEASUREMENT

TOPIC 100: INEQUALITY TRENDS IN PAKISTAN

In the rural areas, the Gini coefficient has declined from 0.25 in 2004-05 to 0.24 in 2005-06 and again increased to 0.25 in the year 2007-08; whereas in urban areas, inequality increased from 0.32 in 2001-02 to 0.33 during the year 2004-05; and further increased to 0.34 during the year 2005-06. However, it registered a decline from 0.34 in 2005-06 to 0.32 for the year 2007-08. Importantly, urban income inequality increased faster than overall inequality during 2005-06. Table 13.4 shows the trends of consumption expenditure share by quintiles for Pakistan. The ratio of the highest to lowest quintile, which measures the gap between the rich and the poor, deteriorated from 4.15 in 2004-05 to 4.2 in 2005-06 at the national level, indicating a shifting of resources from poor to rich. However, the ratio declined to 4.0 during the year 2007-08, consistent with increased the share of the poor in rural areas in 2005-06. the rich-poor gap narrowed in 2005-06 as the ratio declined from 2.19 in 2004-05 to 1.97 in 2005-06. However, the ratio increased to 2.2 during the year 2007-08 indicating increase in inequalities.

TOPIC 101: MEASURES OF INEQUALITY

Following are the measurements of the inequality:

- Decile dispersion ratio for inequality measurement
- Gini coefficient of inequality
- Lorenz curve for inequality
- Generalized entropy measure of inequality
- Atkinson inequality measure
- Kuznets Ratio
- Palma Ratio

TOPIC 102: DECILE DISPERSION RATIO FOR INEQUALITY MEASUREMENT

- A simple and popular measure of inequality is the decile dispersion ratio, which presents the ratio of the average consumption (or income) of the richest 10 percent of the population to the average consumption (or income) of the poorest 10 percent.
- This ratio can also be calculated for other percentiles (for instance, dividing the average consumption of the richest 5 percent, the 95th percentile, by that of the poorest 5 percent, the 5th percentile).
- The decile dispersion ratio is readily interpretable, by expressing the income of the top 10 percent (the “rich”) as a multiple of that of those in the poorest decile (the “poor”).
- However, it ignores information about incomes in the middle of the income distribution, and does not even use information about the distribution of income within the top and bottom deciles.

TOPIC 103: GINI COEFFICIENT OF INEQUALITY

The most widely used single measure of inequality is the Gini coefficient. It is based on the Lorenz curve, a cumulative frequency curve that compares the distribution of a specific variable (for example, income) with the uniform distribution that represents equality. To construct the Gini coefficient, graph the cumulative percentage of households (from poor to rich) on the horizontal axis and the cumulative percentage of expenditure (or income) on the vertical axis.

The diagonal line represents perfect equality. The Gini coefficient is defined as $A / (A + B)$, where A and B are the areas shown in the figure. If $A = 0$, the Gini coefficient becomes 0, which means perfect equality, whereas if $B = 0$, the Gini coefficient becomes 1, which means complete

inequality. In this example, the Gini coefficient is about 0.35. Some users, including the World Bank, multiply this number by 100, in which case it would be reported as 35. Formally, let x_i be a point on the x-axis, and y_i a point on the y-axis. Then:

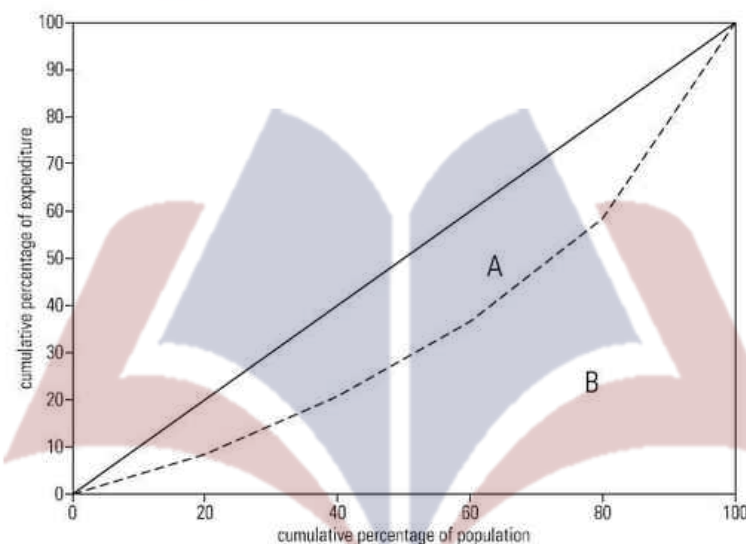
$$Gini = 1 - \sum_{i=1}^N (x_i - x_{i-1})(y_i + y_{i-1}).$$

When there are N equal intervals on the x-axis, above formula simplifies to

$$Gini = 1 - \frac{1}{N} \sum_{i=1}^N (y_i + y_{i-1}).$$

TOPIC 104: LORENZ CURVE FOR INEQUALITY

Figure 6.1 Lorenz Curve



TOPIC 105: CHARACTERISTICS OF GINI AS GOOD MEASURE FOR INEQUALITY

The Gini coefficient is not entirely satisfactory. To see this, consider the criteria that make a good measure of income inequality:

- **Mean independence.** If all incomes were doubled, the measure would not change. The Gini satisfies this.
- **Population size independence.** If the population were to change, the measure of inequality should not change, all else equal. The Gini satisfies this, too.
- **Symmetry.** If any two people swap incomes, there should be no change in the measure of inequality. The Gini satisfies this.
- **Pigou-Dalton Transfer sensitivity.** Under this criterion, the transfer of income from rich to poor reduces measured inequality. The Gini satisfies this, too.

TOPIC 106: GENERALIZED ENTROPY MEASURE OF INEQUALITY

The Theil indexes and the mean log deviation measure, both belong to the family of generalized entropy (GE) inequality measures. The general formula is given by:

$$GE(\alpha) = \frac{1}{\alpha(\alpha-1)} \left[\frac{1}{N} \sum_{i=1}^N \left(\frac{y_i}{\bar{y}} \right)^\alpha - 1 \right],$$

Where, $\bar{y}$ is the mean income per person (or expenditure per capita). The values of GE measures vary between zero and infinity, with zero representing an equal distribution and higher values representing higher levels of inequality. The parameter α in the GE class represents the weight given to distances between incomes at different parts of the income distribution, and can take any real value. For lower values of α , GE is more sensitive to changes in the lower tail of the distribution, and for higher.

Values of GE are more sensitive to changes that affect the upper tail. The most common values of α used are 0, 1, and 2. GE (1) is Theil's T index, which may be written as

$$GE(1) = \frac{1}{N} \sum_{i=1}^N \frac{y_i}{\bar{y}} \ln \left(\frac{y_i}{\bar{y}} \right).$$

GE (0), also known as Theil's L, and sometimes referred to as the mean log deviation measure, is given by

$$GE(0) = \frac{1}{N} \sum_{i=1}^N \ln \left(\frac{\bar{y}}{y_i} \right).$$

TOPIC 107: ATKINSON INEQUALITY MEASURE

Atkinson (1970) has proposed another class of inequality measures that are used from time to time. This class also has a weighting parameter ϵ (which measures aversion to inequality). The Atkinson class, which may be computed in Stata using the "ineqdeco" command, is defined as

$$A_\epsilon = 1 - \left[\frac{1}{N} \sum_{i=1}^N \left(\frac{y_i}{\bar{y}} \right)^{1-\epsilon} \right]^{1/(1-\epsilon)}, \quad \epsilon \neq 1$$

$$= 1 - \frac{\prod_{i=1}^N (y_i^{1/N})}{\bar{y}}, \quad \epsilon = 1.$$

To compute Theil's T, first compute $y_i/\bar{y}$, where $\bar{y}$ is the mean income level; then compute in $(y_i/\bar{y})$, take the product, add up the row, and divide by the number of people. Similar procedures yield other GE measures, and the Atkinson measures, too.

COMPARISON OF INEQUALITY MEASURES

TOPIC 108: COMPARISON OF INCOME INEQUALITY MEASURES

Table 6.3 Computing Measures of Inequality

Measure		Region 1					Region 2				
Incomes (y_i)		10	15	20	25	40	20	30	35	45	90
Mean income ($\bar{y}$)	33.00										
$y_i / \bar{y}$		0.30	0.45	0.61	0.76	1.21	0.61	0.91	1.06	1.36	2.73
$\ln(y_i / \bar{y})$		-0.52	-0.34	-0.22	-0.12	0.08	-0.22	-0.04	0.03	0.13	0.44
Product		-0.16	-0.16	-0.13	-0.09	0.10	-0.13	-0.04	0.03	0.18	1.19
GE(1), Theil's T	0.080										
$\ln(\bar{y} / y_i)$		0.52	0.34	0.22	0.12	-0.08	0.22	0.04	-0.03	-0.13	-0.44
GE(0), Theil's L	0.078										
$(y_i / \bar{y})^2$		0.09	0.21	0.37	0.57	1.47	0.37	0.83	1.12	1.86	7.44
GE(2)	0.666										
$(y_i / \bar{y})^{0.5}$		0.55	0.67	0.78	0.87	1.10	0.78	0.95	1.03	1.17	1.65
Atkinson, $\epsilon = 0.5$	0.087										
$(y_i)^{1/2}$		1.26	1.31	1.35	1.38	1.45	1.35	1.41	1.43	1.46	1.57
Atkinson, $\epsilon = 1$	0.164										
$(y_i / \bar{y})^{-1}$		3.30	2.20	1.65	1.32	0.83	1.65	1.10	0.94	0.73	0.37
Atkinson, $\epsilon = 2$	0.290										

TOPIC 109: COMPARISON OF CONSUMPTION INEQUALITY MEASURES

Table 6.4 Expenditure Inequality in Selected Developing Countries

Country	Gini coefficient	Theil's T	Theil's L
Côte d'Ivoire, 1985–86	0.435	0.353	0.325
Ghana, 1987–88	0.347	0.214	0.205
Jamaica, 1989	—	0.349	0.320
Peru, 1985–86	0.430	0.353	0.319
Vietnam, 1992–93	0.344	0.200	0.169

Source: Reported in Dollar and Glewwe (1996, 40).

Note: — = Not available. The numbers for Vietnam differ from those shown in table 6.2 because a slightly different measure of expenditure per capita was used in the two cases.

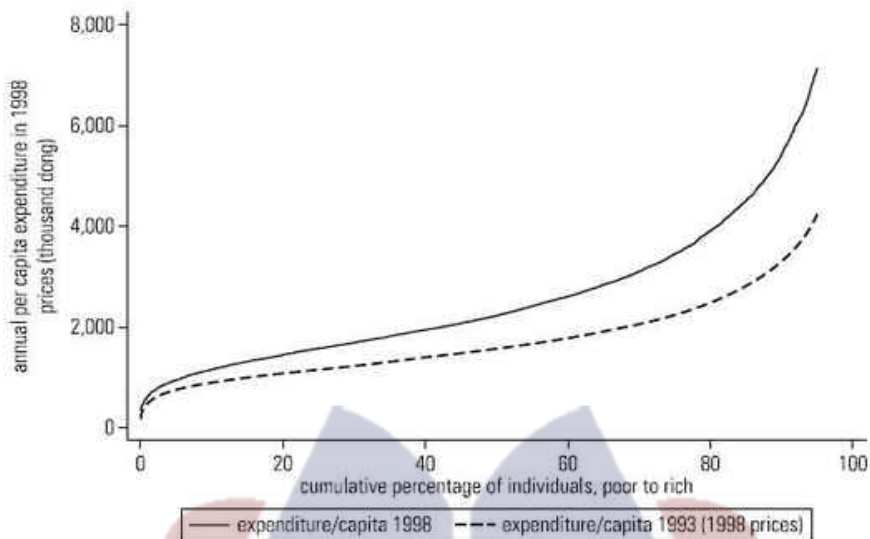
TOPIC 110: INEQUALITY MEASUREMENT COMPARISON

The nature of changes in inequality over time can also be analyzed. One could focus on changes for different groups of the population to show whether inequality changes have been similar for all or have taken place, say, in a particular sector of the economy. In rural Tanzania, average incomes increased substantially between 1983 and 1991—apparently tripling over this period—but inequality increased, especially among the poor. Although the nationwide Gini coefficient for income per adult equivalent increased from 0.52 to 0.72 during this period, the poverty rate fell from 65 percent to 51 percent. Ferreira (1996) argues that a major cause of the rise in both rural incomes and rural inequality was a set of reforms in agricultural price policy; despite higher prices, poorer and less efficient farmers found themselves unable to participate in the growth experienced by wealthier, more efficient farmers.

In comparing distributions over time, one of the more useful graphs is a Pen's Parade, which is a form of quantile graph. On the horizontal axis, every person is lined up from poorest to richest,

while the vertical axis shows the level of expenditure (or income) per capita. Often the graph is truncated toward the upper end of the distribution, to focus on changes at the lower end, including the zone in which people are in poverty. If the axes were flipped, this graph would simply be a cumulative density function.

Figure 6.2 Pen's Parade (Quantile Function) for Expenditure per Capita, Vietnam, 1993 and 1998



Source: Created by the authors, based on data from the Vietnam Living Standards Surveys of 1992–93 and 1998.

Note: This function is truncated at the 95th percentile.

TOPIC 111: PRO-POOR AND PRO-RICH GROWTH

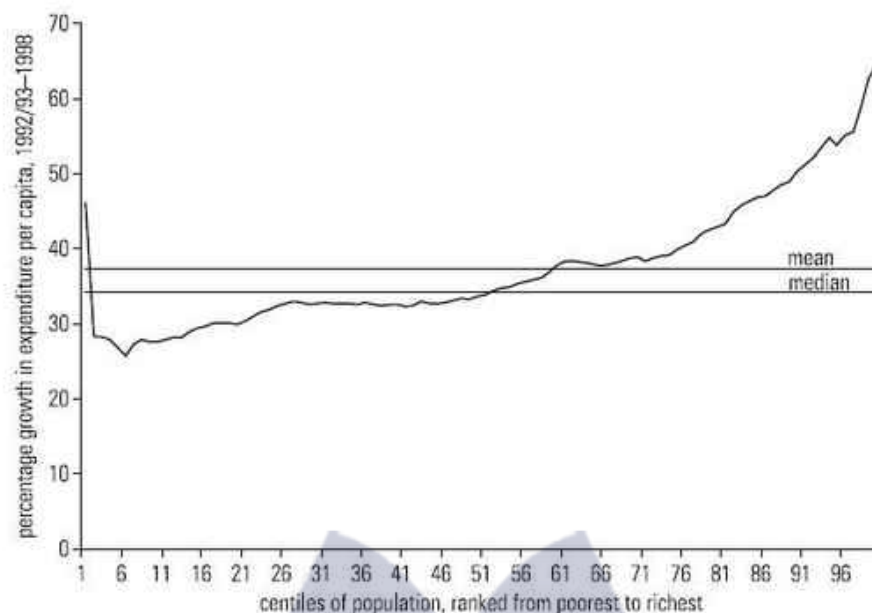
As national income (or expenditure) rises, the expenditure of the poor may rise more or less quickly than that of the country overall. A visually compelling way to show this effect is with a growth incidence curve, which can be computed as long as data are available from surveys undertaken at two times. The procedure is as follows:

- Divide the data from the first survey into centiles—for instance, using the `xtile` command in Stata—and compute expenditure per capita for each of the 100 centiles.
- Divide the data from the second survey into centiles, and again compute expenditure per capita for each centile.
- After adjusting for inflation, compute the percentage change in (real) expenditure per capita for each centile and graph the results.

TOPIC 112: MEASUREMENT OF PRO-POOR GROWTH

The “rate of pro-poor growth,” suggested by Ravallion and Chen (2003), is to compute the mean growth rate of expenditure per capita experienced by the poor. In 1992–93 the headcount poverty rate was 57 percent in Vietnam; averaging the growth in expenditure for this group using the data that underlie the growth incidence curve yields 32 percent. This means that, although expenditure per capita rose by 37 percent nationwide over the five-year interval between the two surveys, the increase was 32 percent for the poor.

Figure 6.3 Poverty Incidence Curve for Expenditure per Capita, Vietnam, 1993 and 1998



Source: Created by the authors, based on data from the Vietnam Living Standards Surveys of 1992-93 and 1998.

TOPIC 113: DECOMPOSITION OF INCOME INEQUALITIES

The common inequality indicators mentioned above can be used to assess the major contributors to inequality, by different subgroups of the population and by region.

Example: Average income may vary from region to region, and this alone implies some inequality “between groups.” Moreover, incomes vary inside each region, adding a “within-group” component to total inequality.

More generally, household income is determined by household and personal characteristics, such as education, gender, and occupation, as well as geographic factors including urban and regional location. Some overall inequality is due to differences in such characteristics—this is the “between-group” component—and some occurs because there is inequality within each group, for instance, among people with a given level of education or in a given occupation. The generalized entropy (GE) class of indicators, including the Theil indexes, can be decomposed across these partitions in an additive way, but the Gini index cannot.

To decompose Theil's T index (that is, GE (1)), let Y be the total income of all N individuals in the sample, and $\bar{Y} = Y/N$ be mean income. Likewise, Y_j is the total income of a subgroup (for example, the urban population) with N_j members, and

$\bar{Y}_j = Y_j/N_j$ is the mean income of this subgroup. Using T to represent GE (1),

$$\begin{aligned}
 T &= \sum_{i=1}^N \frac{y_i}{N\bar{y}} \ln \left(\frac{y_i N}{\bar{y} N} \right) \\
 &= \sum_{i=1}^N \frac{y_i}{Y} \ln \left(\frac{y_i N}{Y} \right) \\
 &= \sum_j \left(\frac{Y_j}{Y} \right) T_j + \sum_j \left(\frac{Y_j}{Y} \right) \ln \left(\frac{Y_j / Y}{N_j / N} \right),
 \end{aligned}$$

where T_j is the value of GE(1) for subgroup j . and the last equation separates the inequality measure into two components, the first of which represents within-group inequality while the second term measures the between-group inequality

TOPIC 114: EXAMPLES FOR INEQUALITY DECOMPOSITION

Table 6.5 Decomposition of Inequality in Expenditure per Capita by Area, Vietnam, 1993 and 1998

Area	Theil's L (GE(0))		
	1993	1998	Change
All Vietnam	0.160	0.199	0.039
Urban only	0.173	0.189	0.016
Rural only	0.118	0.120	0.002
Decomposition			
"Within" inequality	0.129	0.135	
"Between" inequality	0.031	0.064	
Memo: "Between" inequality as percentage of total inequality	20	32	

Source: Authors' calculations based on Vietnam Living Standards Surveys of 1992-93 and 1998.

GINI COEFFICIENT AND INCOME DYNAMICS**TOPIC 115: CHANGE IN INCOME AND GINI COEFFICIENT**

We are often interested in which of the different income sources, or components of a measure of well-being, are primarily responsible for the observed level of inequality.

For example, if total income can be divided into self-employment income, wages, transfers, and property income, the distribution of each income source can be examined.

However, a rise in property income would be associated with an increase in inequality.

Generally, results such as these depend on two factors:

- The importance of the income source in total income (for larger income sources, a given percentage increase will have a larger effect on overall inequality)
- The distribution of that income source (if it is more unequal than overall income, an increase in that source will lead to an increase in overall inequality).

Table 6.6 Expected Change in Income Inequality Resulting from a 1 Percent Change in Income (or Wealth) Source, 1997 (as Percentage of Change in Gini Coefficient), Peru

Income source	Expected change	Wealth sources	Expected change
Self-employment income	-4.9	Housing	1.9
Wages	0.6	Durable goods	-1.5
Transfers	2.2	Urban property	1.3
Property income	2.1	Agricultural property	-1.6
		Enterprises	0

Source: Rodriguez 1998.

TOPIC 116: INCOME DISTRIBUTION DYNAMICS

There is a longstanding, if inconclusive, debate about the links between income distribution and economic growth. Simon Kuznets (1966), based on his analysis of the historical experience of the United Kingdom and the United States, believed that in the course of economic development, inequality first rises and then falls. Although there are other cases where this pattern has been observed, it is by no means inevitable. There are many components of inequality, and they may interact very differently depending on the country. Bourguignon, Ferreira, and Lustig (2005) emphasize this diversity of outcomes, and argue that changes in income distribution are largely due to three “fundamental forces”:

- Changes in the distribution of assets and the personal characteristics of the population (for example, educational levels, gender, ethnicity, capital accumulation)—the endowment effects
- Changes in the returns to these assets and characteristics (for example, the wage rate, or profit rate)—the price effects
- Changes in how people deploy their assets, especially in the labor market (for example, whether they work, and if they do, in what kind of job)—the occupational choice effects.

To these three one might also add demographic effects; for instance, if households have fewer children, the earnings of working members will stretch further, and measured income per capita will rise.

TOPIC 117: SIZE DISTRIBUTION AND INEQUALITY MEASURE

Table 5.1: Typical Size Distribution of Personal Income in a Developing Country by Income Shares—Quintiles and Deciles

Individuals	Personal Income (money units)	Share of Total Income (%)	
		Quintiles	Deciles
1	0.8		
2	1.0		1.8
3	1.4		
4	1.8	5	3.2
5	1.9		
6	2.0		3.9
7	2.4		
8	2.7	9	5.1
9	2.8		
10	3.0		5.8
11	3.4		
12	3.8	13	7.2
13	4.2		
14	4.8		9.0
15	5.9		
16	7.1	22	13.0
17	10.5		
18	12.0		22.5
19	13.5		
20	15.0	51	28.5
Total (national income)	100.0	100	100.0

Note: Measure of inequality = ratio of top 20% to bottom 40% = $51/14 = 3.64$.

TOPIC 118: CURVATURE OF THE LORENZ CURVE AND INEQUALITY

The Lorenz Curve:

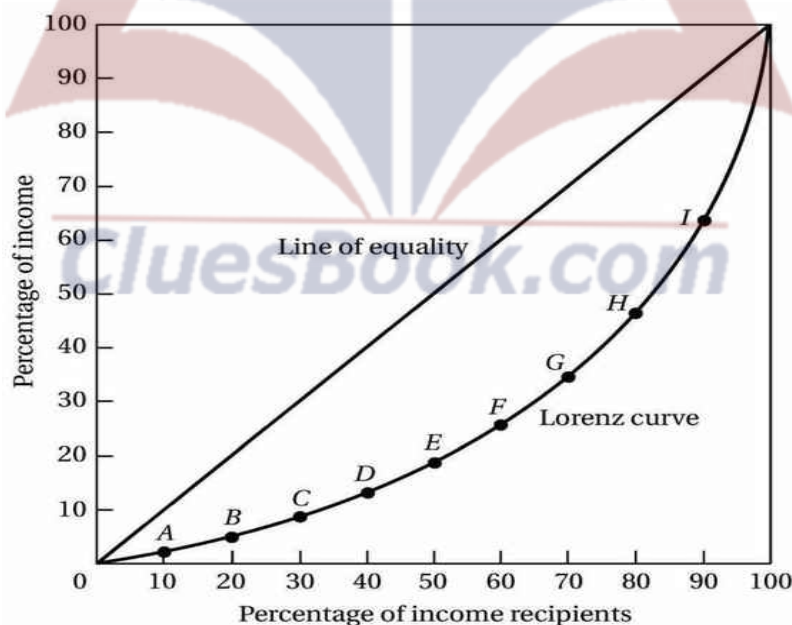
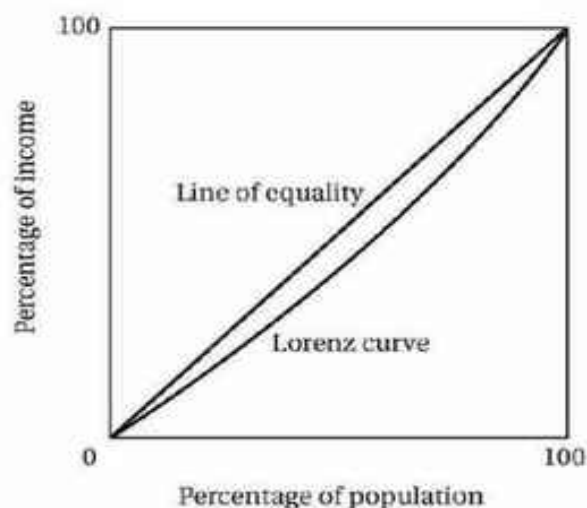
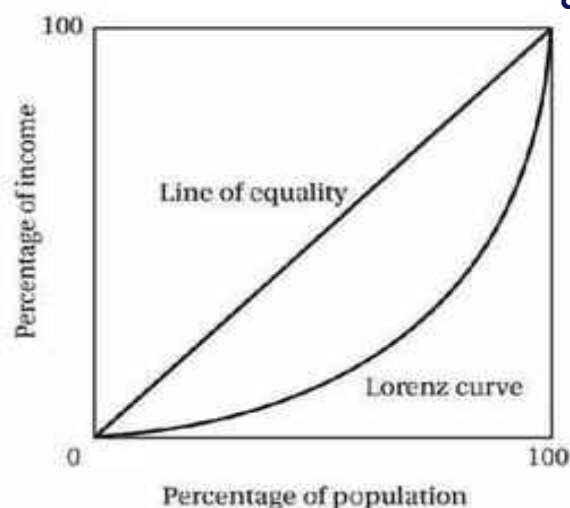


Figure 5.2: The Greater the Curvature of the Lorenz Line, the Greater the Relative Degree of Inequality



(a) A relatively equal distribution



(b) A relatively unequal distribution

TOPIC 119: GINI COEFFICIENTS AND AGGREGATE MEASURES OF INEQUALITY

Figure 5.3 Estimating the Gini Coefficient

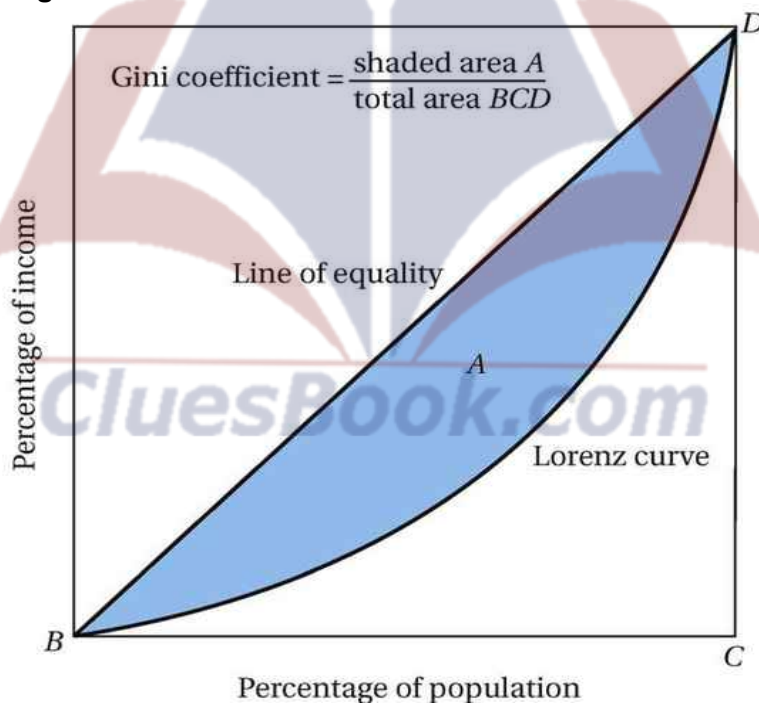
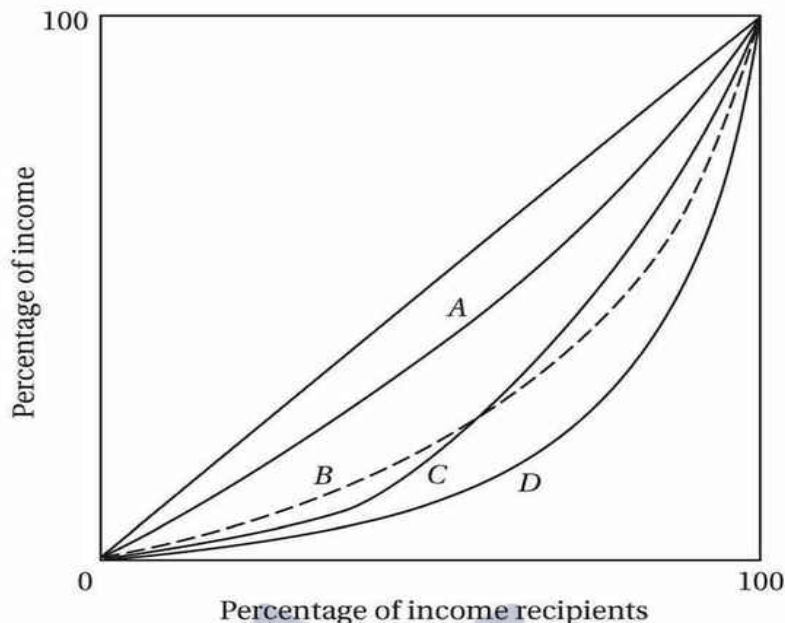


Figure 5.4: Four Possible Lorenz Curves



TOPIC 120: WHAT'S SO BAD ABOUT EXTREME INEQUALITY?

We assume that social welfare depends positively on the level of income per capita but negatively on poverty and negatively on the level of inequality.

- First, extreme income inequality leads to economic inefficiency.

At any given average income, the higher the inequality, the smaller the fraction of the population that qualifies for a loan or other credit (due to lack of collateral). When low-income individuals (whether they are absolutely poor or not) cannot borrow money, they generally cannot adequately educate their children or start and expand a business. Inequality may lead to an inefficient allocation of assets.

- The second reason to be concerned with inequality above the poverty line is that extreme income disparities undermine social stability and solidarity.

High inequality strengthens the political power of the rich and hence their economic bargaining power. Usually this power will be used to encourage outcomes favorable to themselves. High inequality facilitates rent seeking, including actions such as excessive lobbying, large political donations, bribery, and cronyism. When resources are allocated to such rent-seeking behaviors, they are diverted from productive purposes that could lead to faster growth. High inequality makes poor institutions very difficult to improve, because the few with money and power are likely to view themselves as worse off from socially efficient reform, and so they have the motive and the means to resist it.

- Third, extreme inequality is generally viewed as unfair.

The philosopher John Rawls proposed a thought experiment to help clarify why this is so. Suppose that before you were born into this world, you had a chance to select the overall level of inequality among the earth's people but not your own identity. That is, you might be born as Bill Gates, but you might be born as the most wretchedly poor person in rural Ethiopia with equal probability. Rawls calls this uncertainty the "veil of ignorance." Of course, if everyone had the same income no matter what, there would be little incentive to work hard, gain skills, or innovate. As a result, most people vote for some inequality of income outcomes, to the extent

that these correspond to incentives for hard work or innovation. But even so, most vote for less inequality than is seen in the world (or in virtually any country) today. This is because much of the inequality we observe in the world is based on luck or extraneous factors, such as the inborn ability to kick a football or the identity of one's great-grandparents.



POVERTY PROFILES AND INDICATORS

TOPIC 121: WHAT IS POVERTY PROFILE?

A poverty profile sets out the major facts on poverty and examines the pattern of poverty to see how it varies by

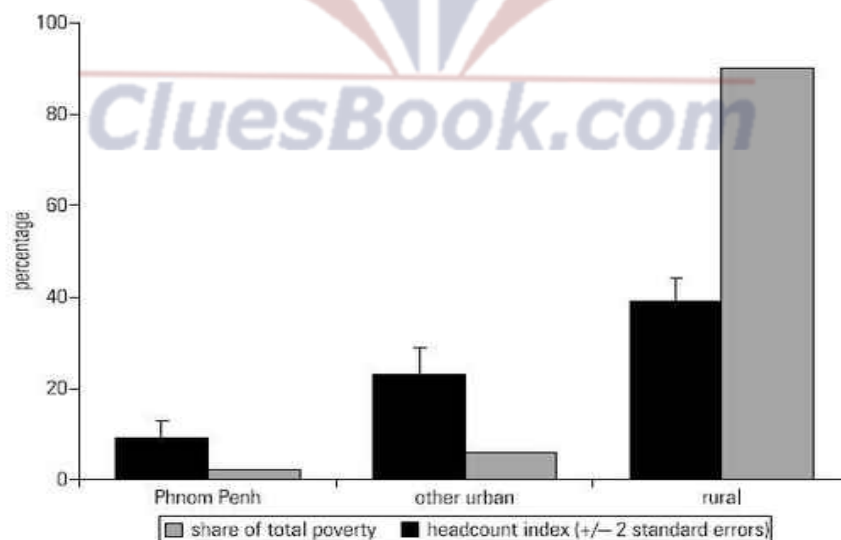
- Geography (region, urban or rural, mountain or plain, and so on)
- Community characteristics (for example, villages with and without a school)
- Household and individual characteristics (for example, educational level).

A well-presented poverty profile can be immensely useful in assessing how economic change is likely to affect aggregate poverty, even though the profile typically just uses basic techniques such as tables and graphs. Some tables show the poverty rate for each group, for example, by level of education of household head, or by region of the country. It is good practice to show the confidence intervals of the poverty rates, which works especially well when the information is shown graphically. Alternatively, one may show what fraction of the poor has access to facilities (running water or electricity, for instance) or live in a given region, and compare this with the circumstances of the non-poor.

TOPIC 122: WHAT IS A COUNTRY POVERTY PROFILE?

A country poverty profile sets out the major facts on poverty (and typically, inequality), and then examines the pattern of poverty to see how it varies by geography (by region, urban or rural, mountain or plain, and so on), by community characteristics (for example, in communities with and without a school), and by household characteristics (for example, by education of household head or by household size). Hence, a poverty profile is a comprehensive poverty comparison, showing how poverty varies across subgroups of society. A well-presented poverty profile can be immensely informative and extremely useful in assessing how the sectoral or regional pattern of economic change is likely to affect aggregate poverty, even though it typically uses basic techniques such as tables and graphs.

Figure 7.1 Headcount Poverty by Region, Cambodia, 1999



Source: Gibson 1999.

TOPIC 123: SELECTED CHARACTERISTICS OF THE POOR

Table 7.1 Selected Characteristics of the Poor in Ecuador, 1994

Service	Percentage with access to basic services					
	Urban		Rural		Total	
	Poor	Nonpoor	Poor	Nonpoor	Poor	Nonpoor
Sewerage connection	57	83	12	28	30	64
Electricity supply	98	100	62	76	76	91
Water from public network	61	79	18	23	35	59
Waste collection	60	77	1	6	24	52

Source: World Bank, 1996.

TOPIC 124: POVERTY AMONG HOUSEHOLD GROUPS

Table 7.2 Poverty among Household Groups in Malawi, 1997–98

Household characteristics	Headcount (P_0) (percent)	Poverty gap (P_1) (percent)	Squared poverty gap (P_2)($\times 100$)
Gender of head			
Male	58	22	11
Female	66	28	15
Education levels of head			
No education	71	31	17
Less than standard IV	63	25	13
Standard IV	58	22	11
Primary school	47	15	6
Secondary school	30	8	3
University	16	7	4

Source: Malawi National Economic Council 2000.

Note: Standard IV is the fourth year of primary school. Primary education follows an eight-year cycle, followed by four years of secondary school.

TOPIC 125: INDICATORS OF POVERTY PROFILE-I

The World Bank's *Poverty Reduction Handbook* (1992) sets out some key questions that one may ask when preparing a poverty profile:

- Does poverty vary widely between different areas in the country?
- Are the most populated areas also the areas where most of the poor live?
- How is income poverty correlated with gender, age, urban and rural, racial or ethnic characteristics?
- What are the main sources of income for the poor?
- On what sectors do the poor depend for their livelihoods?
- What products or services—tradables and non-tradables—do the poor sell? A tradable good is one that is, or easily might be, imported or exported. The prices of such goods are influenced by changes in the world price and the exchange rate.
- To what extent are the rural poor engaged in agriculture? In off-farm employment?

- How large a factor is unemployment? Underemployment?
- What are the important goods in the consumption basket of the poor? How large are the shares of tradables and non-tradables?
- How is income poverty linked to malnutrition or educational outcomes?
- What are the fertility characteristics of the poor?
- To what public services do the poor have access? What is the quality of these services?
- How important are private costs of education and health for the poor?
- Can the poor access formal or informal credit markets?
- What assets—land, housing, and financial—do the poor own? Do property rights over such assets exist?
- How secure is their access to, and tenure over, natural resources?

TOPIC 126: INDICATORS OF POVERTY PROFILE-II

- How secure is their access to, and tenure over, natural resources?
- Is environmental degradation linked to poverty?
- How variable are the incomes of the poor? What risks do they face?
- Are certain population groups in society at a higher risk of being poor than others? Households that are at high risk of being poor, but are not necessarily poor now, are considered to be vulnerable (see chapter 12 for more details about vulnerability).

TOPIC 127: ADDITIVE POVERTY MEASURES

It is much easier to make poverty comparisons using an additive poverty measure, where poverty in different areas can be added up easily to get the overall poverty rate. To see how this works, suppose the population can be divided into m mutually exclusive subgroups. Then a poverty profile presents poverty measures, $P_{\alpha, j}$, for $j = 1, \dots, m$. Aggregate poverty can then be written as the population-weighted average of these subgroup poverty measures:

$$P_{\alpha} = \frac{1}{N} \sum_{j=1}^m P_{\alpha, j} N_j,$$

$$P_{\alpha, j} = \frac{1}{N_j} \sum_{i=1}^{N_j} p_{\alpha}(z_j, y_i^j)$$

is the poverty measure for subgroup j with population N_j . Here y_i^j is the welfare indicator of individual i who belongs to subgroup j , where $i = 1, \dots, N_j$. The total population N is equal to $\sum_{j=1}^m N_j$.

POVERTY COMPARISONS OVER TIME

TOPIC 128: TYPES OF POVERTY PROFILE PRESENTATION

There are two main ways of presenting a poverty profile. The first splits the sample by some characteristic for instance, region of residence, or age of household head then shows the poverty rate for each component,

Table 7.2 Poverty among Household Groups in Malawi, 1997–98

Household characteristics	Headcount (P_0) (percent)	Poverty gap (P_1) (percent)	Squared poverty gap (P_2)($\times 100$)
Gender of head			
Male	58	22	11
Female	66	28	15
Education levels of head			
No education	71	31	17
Less than standard IV	63	25	13
Standard IV	58	22	11
Primary school	47	15	6
Secondary school	30	8	3
University	16	7	4

Source: Malawi National Economic Council 2000.

the second divides up the sample by poverty status (for example, poor vs. non-poor, or by expenditure per capita quintile), then summarizes the incidence of characteristics, such as educational level, or access to piped water.

Table 7.1 Selected Characteristics of the Poor in Ecuador, 1994

Service	Percentage with access to basic services					
	Urban		Rural		Total	
	Poor	Nonpoor	Poor	Nonpoor	Poor	Nonpoor
Sewerage connection	57	83	12	28	30	64
Electricity supply	98	100	62	76	76	91
Water from public network	61	79	18	23	35	59
Waste collection	60	77	1	6	24	52

Source: World Bank 1996.

Both methods of presentation are useful, but their value also depends on the use to which they will be put. Suppose the government wants to provide cash grants to the poor, but in practice cannot identify which households are poor, and so plans to give grants only to those living in chosen target regions (indicator targeting).

TOPIC 129: POVERTY COMPARISONS OVER TIME

If two or more rounds of household surveys are available, one may be able to measure the evolution of poverty over time. Ideally, such a measurement would use data from highly comparable questionnaires that use a similar sampling frame and research protocol and the same definitions of income or consumption.

If we have constructed a poverty line in the base year using the cost of basic needs approach, we just need to adjust this poverty line over time by applying the changes over time in the costs

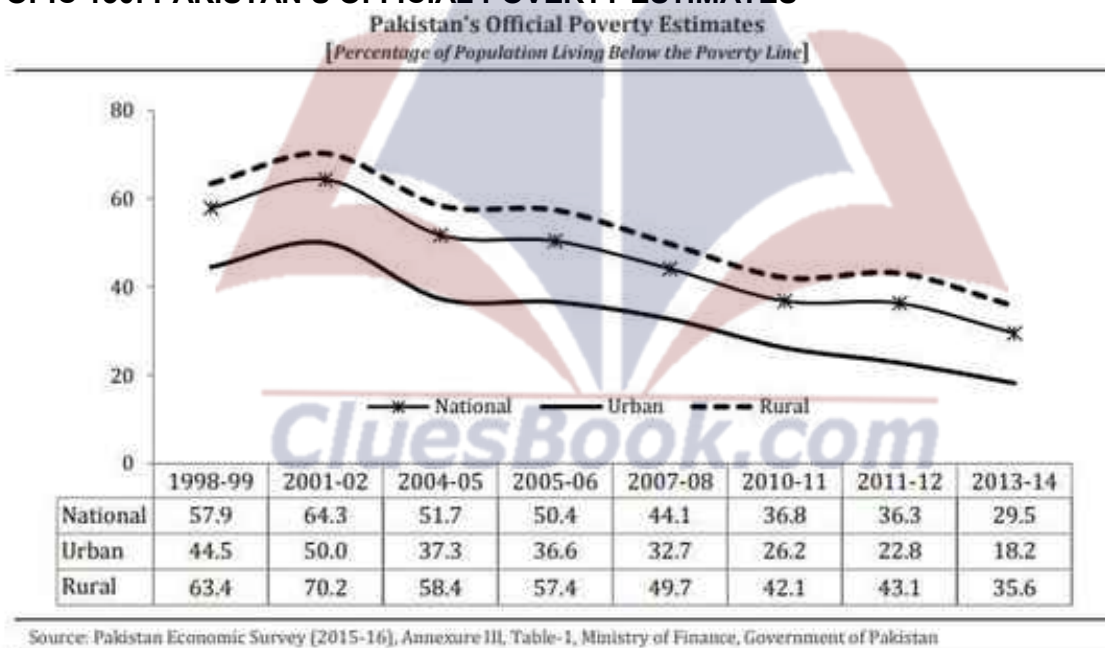
of each component of the poverty line (food, and nonfood items, typically). We can then compute the poverty rate in the second period. In practice, we might want to do this for each main region of the country, to take regional price variations into account. Alternatively, we could deflate income or expenditure from the second period and compare it with the original poverty line.

In practice, the lack of good price data, especially broken down by region over time, is a serious problem; indeed, it is the Achilles heel of intertemporal poverty comparisons. However, it is not the only problem, because household survey questionnaires tend to evolve. Such changes may adapt the surveys to better reflect the standard of living at a given time, but it makes intertemporal comparability more difficult. But the demand for poverty comparisons over time is high, by governments, nongovernmental organizations, and others. So even if the comparisons are less than ideal, they are made nonetheless.

In such cases, the analyst needs to be sure to

- Correct for major differences in the sampling frame and sampling method for the different surveys or the different rounds of a panel survey
- Use regional and temporal price indexes to ensure a similar definition of the poverty line over time and across regions (or to measure “real” income or expenditure over time)
- Adjust the definition of consumption or income aggregates over time to ensure that a similar definition is used.

TOPIC 130: PAKISTAN'S OFFICIAL POVERTY ESTIMATES



TOPIC 131: POVERTY RISKS FOR SELECTED GROUPS OF HOUSEHOLDS:

This concept can be applied to examine whether, over time, the relative poverty risk of specific population groups decreases or increases. Table 7.4 compares the relative poverty risk of various groups in Peru in 1994 and 1997. It shows, for instance, that households with seven persons or more were 71 percent more likely to be poor in 1994 than other households in society; and that this relative risk was 106 percent in 1997 (that is, they were more than twice as likely to be poor as other households in Peru). Or again, between 1994 and 1997, the relative risk of being poor for households where the spouse of the head was working diminished (from – 11 percent to –21 percent).

Table 7.4 Poverty Risks for Selected Groups of Households, Peru
(percent)

Household characteristic	1994	1997
Households using house for business purposes	-28	-29
Rural households with at least one member in off-farm employment	-24	-23
Households where spouse of head was working	-11	-21
Households without water or sanitation	54	50
Households without electricity	63	69
Households where head had less than secondary education	73	72
Households of seven persons or more	71	106

Source: World Bank 1999.

TOPIC 132: POVERTY PROFILE AND CHARACTERISTICS OF THE POOR

The estimated poverty lines for urban and rural areas are then mapped on household per adult equivalent total expenditure for computing various poverty measures or aggregates. Table-2 displays these poverty indices. Overall, 38 percent of the population was poor during the year 2015-16. The incidence, depth and severity of urban poverty are relatively lower as compared to rural areas.

Table-2
Estimates of Poverty Indices, 2015-16
[Percentage of Population]

	Pakistan	Urban	Rural
Head Count Index [Incidence]	37.9	31.9	41.2
Poverty Gap Index [Severity]	8.2	6.7	9.0
FGT2 Index [Depth]	2.5	2.1	2.8

Source: Estimated from household level data of HIES, 2015-16

TOPIC 133: TRANSITION IN POVERTY PROFILE OF PAKISTAN

Table-3 portrays the trend in poverty incidence since 1987-88. All these poverty numbers are estimated using unit record household level HIES data and by applying throughout a consistent and identical methodology for estimating poverty line and poverty indices. The table indicates that the latest national poverty incidence in terms of percentage of population for the year 2015-16 is similar to that estimated for the year 2010-11. Changes (rise and fall) are however observed in urban and rural poverty headcounts, leaving national poverty estimates unchanged. It is pertinent to note that in terms of absolute numbers, 74 million persons were estimated poor during the year 2015-16, while the estimated poor population was 61 million in 2010-11.

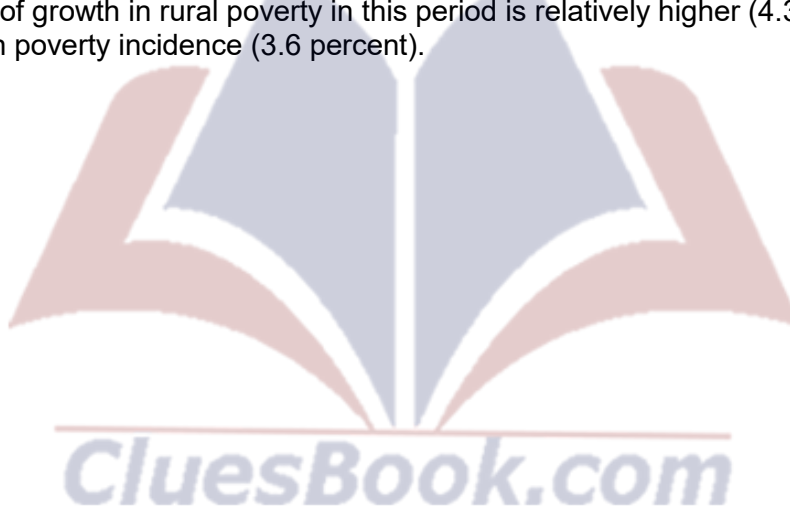
Table-3
Trends in Poverty Incidence
[Percentage of Population Living Below the Poverty Line]

	1987-88	1996-97	1998-99	2001-02	2004-05	2010-11	2015-16
Pakistan	23	28 (2.4)	30 (3.6)	33 (3.3)	30 (-3.0)	38 (4.4)	38 (0.0)
Urban	19	25 (3.5)	25 (0.0)	30 (6.7)	28 (-2.2)	34 (3.6)	32 (-1.2)
Rural	26	30 (1.7)	32 (3.3)	35 (3.1)	31 (-3.8)	39 (4.3)	41 (1.0)

Note: Annualized Growth Rates (percent) from previous period are given in parenthesis.

Source: Latest estimates are based on HIES 2015-16. The poverty incidences for other years are taken from Jamal (2013). Consistent methodology and calorie norms are applied for all years.

The table reveals a relatively higher incidence in rural poverty during the period 1987-88 and 2015-16. A comparison of 2001-02 and 2004-05, shows a decline of 3 percentage point in poverty incidence. Moreover, the decline in urban poverty is relatively less than the rural poverty. Rural poverty in this period has dropped with an annual growth rate of 4 percent, while the decline is about 2 percent in the case of urban poverty incidence. On the contrary, during 2004-05 and 2010-11, estimated poverty incidences are showing again an upward trend. Further, the rate of growth in rural poverty in this period is relatively higher (4.3 percent) than the increase in urban poverty incidence (3.6 percent).



POVERTY PROFILE OF PAKISTAN

TOPIC 134: PERFORMANCE OF PAKISTAN'S KEY STRUCTURAL AND STABILIZATION INDICATORS

In order to get an idea regarding reasons behind the stagnant poverty numbers after 2010-11, Table-4 is developed which shows the performance of Pakistan's key structural and stabilization indicators during the period 2011-15. The information in the table reveals that the inflation rate (CPI) – a major determinant of poverty – has been crashed from 14 to 5 percent. This trend in CPI with the improvement in budget deficit perhaps restricted the rise in the poverty level. Conversely, the growth in real GDP has slightly improved from 3.6 to 4.0 percent which was not enough to cause drop in the level of consumption poverty. Significant rupee depreciation as well as worsening current account balance are also observed during this period.

Table-4 Performance of Pakistan's Key Structural and Stabilization Indicators					
	2010-11	2011-12	2012-13	2013-14	2014-15
Real GDP Growth Rate (Base Year, 2005-06)	3.6	3.8	3.7	4.1	4.0
• Agriculture	2.0	3.6	2.7	2.7	2.5
• Manufacturing	2.5	2.1	4.6	4.5	3.9
• Service Sector	3.9	4.4	5.1	4.4	4.3
Domestic Saving – Percent of GDP	9.7	7.8	8.7	7.5	8.4
Private Investment – Percent of GDP	9.3	9.7	9.8	8.9	10.2
Rate of Inflation – CPI	13.7	11.0	7.4	8.6	4.5
Budget Deficit – Percent of GDP	6.5	8.8	8.2	5.5	5.3
Capital Market – KSE 100 Index (1991 = 1,000)	12,496	13,801	21,006	29,653	33,729
Current Account Balance – Percent of GDP	0.1	-2.1	-1.1	-1.2	-1.0
Exchange Rate (Rupees per US Dollar)	85.5	89.2	96.7	102.9	101.3

Sources: Pakistan Economic Survey, 2015-16 | Statistical Supplement, 2013-14

TOPIC 135: ESTIMATES OF VULNERABILITY TO POVERTY

Table-5 Estimates of Vulnerability to Poverty - 2016 [Percentage of Population]				
	Poor Population	Population Vulnerable to Poverty		
		Overall	Poor	Non-Poor
National:				
Overall	37.90	50.97	79.51	33.66
Urban	31.85	38.79	73.01	22.96
Rural	41.16	57.48	82.19	40.30

Source: Estimated from HIES (2015-16) data.

According to the table, close to 39 and 57 percent of urban and rural population respectively was vulnerable to poverty in 2016, while the national estimate was 51 percent. As expected, vulnerability to poverty is higher amongst the rural households as compared to the urban. The vulnerable households not only include those that are already poor but also those who are currently above the poverty line and are subject to possible risk with little resources to mitigate such risk. The table also depicts the distribution of vulnerable population among poor and non-poor categories. It is disturbing that even 40 percent of rural non-poor population was vulnerable to poverty which suggests that in near future it is probable that these rural non-poor would become poor. The estimates also suggest that it is unlikely that close to 82 and 73 percent of rural and urban poor households respectively would be moved up.

TOPIC 136 AND 137: POVERTY PROFILE OF PAKISTAN WITH REFERENCE TO AGE, GENDER & DEMOGRAPHIC CHARACTERISTICS

Analysis of poverty data indicates that some of the regions traditionally regarded as suffering from extreme deprivation (such as rural Sindh, Balochistan, and parts of rural NWFP), are not, indeed, among the poorest areas. Punjab, which, on the other hand, has long been regarded as relatively wealthy and better served with rural infrastructure, has pockets of extreme poverty. Part of the explanation for the disparity between 'received wisdom' and the results of distributional data analysis is the unreliability of distributional data from geographically remote and socially inaccessible regions.

Part of the explanation lies in the precise choice of method for poverty analysis. The sensitivity of regional poverty rankings in rural Sindh and Punjab was checked for methodological variations. These regions together comprise the agricultural heartland of Pakistan, and are relatively better integrated into the national economy, both in terms of physical infrastructure and the political-institutional framework. Some of the results -- such as the finding that lower Punjab is a region of extreme poverty, while upper Punjab is the least poor region -- are robust to the choice of welfare indicator and the choice of poverty line. In the case of Sindh the choice of poverty line and that of welfare indicator does matter. Sindh comes across as a region with a relatively low incidence of extreme deprivation, but a region with a relatively high incidence of moderate deprivation. Also, it is a region of relatively high income poverty, but one of relatively low consumption poverty.

Non-income indicators of poverty, such as achievement in basic education, access to health, mortality rates, and gender disadvantage, also rank the regions differently. Regional poverty rankings are, therefore, somewhat contingent on the type of poverty indicator under consideration.

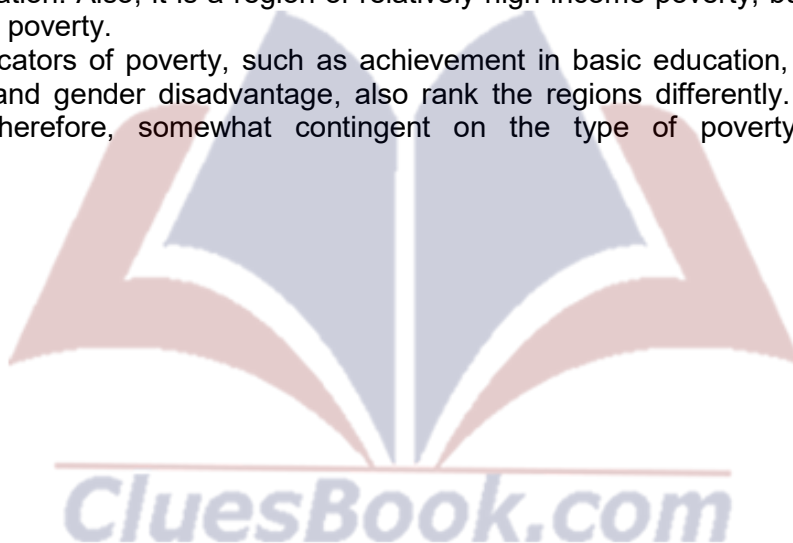


Table – 6
Vulnerability Estimates for Selected
Household Characteristics- 2016
[Percentage of Vulnerable Population]

Overall Vulnerable Population	50.97
Family Size	
1-5	25.16
6-9	52.92
More than 9	76.68
Age of Head of Household	
< 25	57.93
25-50	47.71
50 plus	42.57
Schooling of Head of Household	
Illiterate	67.54
Primary	58.31
Matric	38.16
Inter	22.61
Higher	6.11
Schooling of Spouse	
Illiterate	62.55
Primary	42.03
Matric	19.41
Inter	8.23
Higher	3.43
Occupational Status of Head	
Employer	13.08
Self Employed	46.28
Wage Employed	58.46
Own Cultivator	42.58
Sharecropper	83.85
Livestock Holder	55.84

Source: Estimated from HIES (2015-16) data.

A vulnerability profile by selected household characteristics is displayed in Table 6. The table depicts a positive correlation between vulnerability and household size. According to the table, about 77 percent of households with more than 9 members are vulnerable to poverty. The most vulnerable age group of head of household is less than 25 years after which a decrease in vulnerability is noted. The education level and literacy of head/spouse of household are an important determinant of vulnerability to poverty. As evident from the table, increase in the level of education significantly affects the incidence of vulnerability. For instance, only 6 percent of the population is vulnerable in households where head of the household has tertiary level of education against a 68 percent incidence in case of an illiterate head of the household. Moreover, the educational attainment of a spouse is a relatively stronger factor than the educational attainment of the head of the household in reducing vulnerability. The relationship between vulnerability to poverty and the economic activities in which households are engaged is also important from policy perspectives. In the agricultural sector, sharecroppers are the most vulnerable to poverty (84 percent), while vulnerability for wage employees (mostly in urban areas) is estimated at 58 percent.

Table – 6
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Household Characteristics – 2016
[Percentage of Vulnerable Population]

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Employer	13.08
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Wage Employed	58.46
Own Cultivator	42.58
Sharecropper	83.85
Livestock Holder	55.84

Source: Estimated from HIES (2015-16) data.

TOPIC 138: POVERTY MAPPING

we are often interested in a more detailed poverty map that would show poverty rates for relatively small geographic units, because even within a given region there are typically wide divergences in standards of living, and hence poverty. Relatively detailed poverty maps can, in principle, improve the targeting of interventions.

In designing poverty alleviation projects and allocating subsidies, resources will be used more effectively if the neediest groups can be better targeted, which both reduces the leakage of transfer payments to non-poor persons and reduces the risk that poor persons will be missed by a program. Poverty maps can also help governments articulate their policy objectives. Basing allocation decisions on observed geographic poverty data rather than on subjective rankings of regions increases the transparency of government decision making and thus can help limit the

influence of special interests in allocation decisions. There is a role for well-defined poverty maps in lending credibility to government and donor decision making.

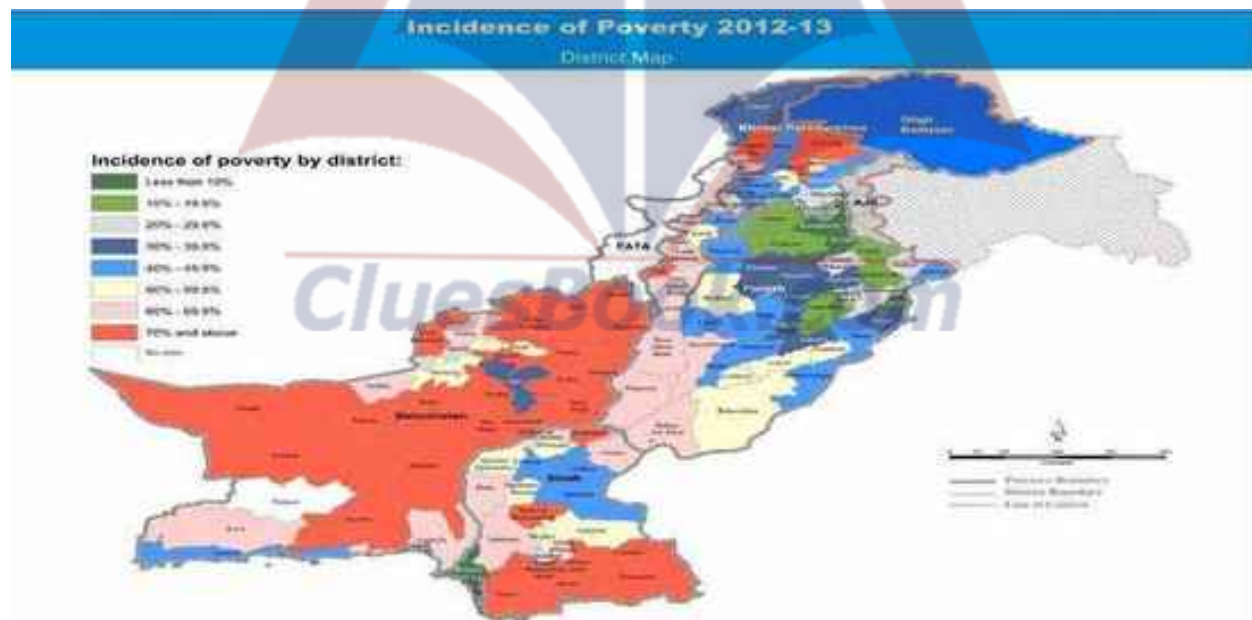
An alternative solution is to combine the survey data with census data to create more detailed poverty maps. Household surveys generate rich data, from which one may estimate such measures as expenditure, income, and poverty, but they cover relatively few households. Conversely, census data (and sometimes large household sample surveys) are available for all households (or very large samples of households) and can provide reliable estimates at highly disaggregated levels such as small municipalities, towns, and villages. But censuses do not contain the income or consumption information necessary to yield reliable indicators of the level and distribution of welfare such as poverty rates or inequality measures.

The basic idea is to use the detailed survey data to construct a “model” of consumption expenditure (or any other household- or individual-level indicators of well-being) as a function of variables that are common to both the household survey and the census. For example, a simple model might take the form

$$\ln(y_i) = \mathbf{X}_i' \mathbf{b} + e_i,$$

Where, y_i is expenditure per capita (or some other welfare measure) for the i th household, and the matrix $\mathbf{X}_i$ includes variables common both to the survey and to the census, such as household size, the educational level of the household head, the proportion of the household consisting of prime-age adults, and sometimes information about the quality of housing.

The second step uses the estimates from equation, along with census data on the $\mathbf{X}_i$ variables, to get predicted values of y_i for every household in the country. These predicted values can then be used to measure poverty at a much more disaggregated level. This whole process is often referred to as small-area estimation (or “micro-level estimation”).



TOPIC 139: ERRORS IN POVERTY MAPPING

We now need to ask how accurate these disaggregated measures are. Elbers, Lanjouw, and Lanjouw (2003) distinguish three types of error:

- **Model error.** Model error occurs because the model in equation is not known exactly; the coefficients are estimated ($\hat{b}$) and are subject to error. The importance of this source of error depends on how tightly model fits the data.

- **Computation error.** Typically, quite small, computation error is due to the need (in many cases) to use simulation techniques in the estimation process.
- **Idiosyncratic error.** This is the error that arises because we do not observe, in the census, all the characteristics of the household that are relevant when measuring welfare. This source of error becomes more important as we try to measure welfare for smaller and smaller target populations (for example, a village or ward rather than a region or country).



DECOMPOSITION OF INEQUALITY FOR PAKISTAN AND CAUSES OF POVERTY

TOPIC 140: DECOMPOSITION OF INCOME INEQUALITY FOR PAKISTAN BY RURAL VS URBAN

Table 1: Trends in gini coefficients

Years	Pakistan	Rural	Urban
1963-64	0.3666	0.3543	0.3698
1966-67	0.3672	0.3416	0.4068
1968-69	0.3456	0.3005	0.3975
1969-70	0.3394	0.3122	0.3694
1970-71	0.3379	0.3061	0.3687
1971-72	0.3607	0.3546	0.3886
1979	0.3946	0.3450	0.4118
1984-85	0.3802	0.3526	0.3884
1985-86	0.3629	0.3410	0.3589
1986-87	0.3580	0.3289	0.3643
1987-88	0.3608	0.3227	0.3782
1990-91	0.4099	0.4218	0.3788
1992-93	0.3937	0.3668	0.3970
1993-94	0.3864	0.3647	0.3685
1996-97	0.3598	0.3517	0.3691
1998-99	0.4187	0.3796	0.4510
2001-02	0.4129	0.3762	0.4615

Source: Anwar (2005)

TOPIC 141: DECOMPOSITION OF CONSUMPTION INEQUALITY FOR PAKISTAN BY RURAL VS URBAN

Table13.4: Gini-Coefficient and Consumption Shares by Quintiles

	PHIS 2001-02			HIES 2004-05			PSLM 2005-06			PSLM 2007-08		
	Urban	Rural	Pakistan	Urban	Rural	Pakistan	Urban	Rural	Pakistan	Urban	Rural	Pakistan
Gini Coefficient	0.32	0.23	0.27	0.33	0.25	0.29	0.34	0.24	0.30	0.32	0.25	0.29
Consumption share by Quintile (%)												
Quintile 1	5.3	12.8	10.1	4.8	12.6	9.5	4.5	13.5	9.6	5.0	13.1	9.9
Quintile 2	8.1	16.9	13.7	7.6	17.1	13.2	8.2	16.8	13.1	9.1	16.1	13.3
Quintile 3	12.1	1	16.8	11.6	19.7	16.4	11.1	20.1	16.2	11.7	19.6	16.4
Quintile 4	19.4	22.4	21.3	18.3	23	21.4	17.8	23	20.8	19.6	22.1	21.1
Quintile 5	55.1	28.4	38	57.7	27.6	39.4	58.4	26.6	40.3	54.6	29.1	39.3
Ratio of Highest to Lowest Quintiles	10.4	2.22	3.76	12.0	2.19	4.15	13.0	1.97	4.2	10.9	2.2	4.0

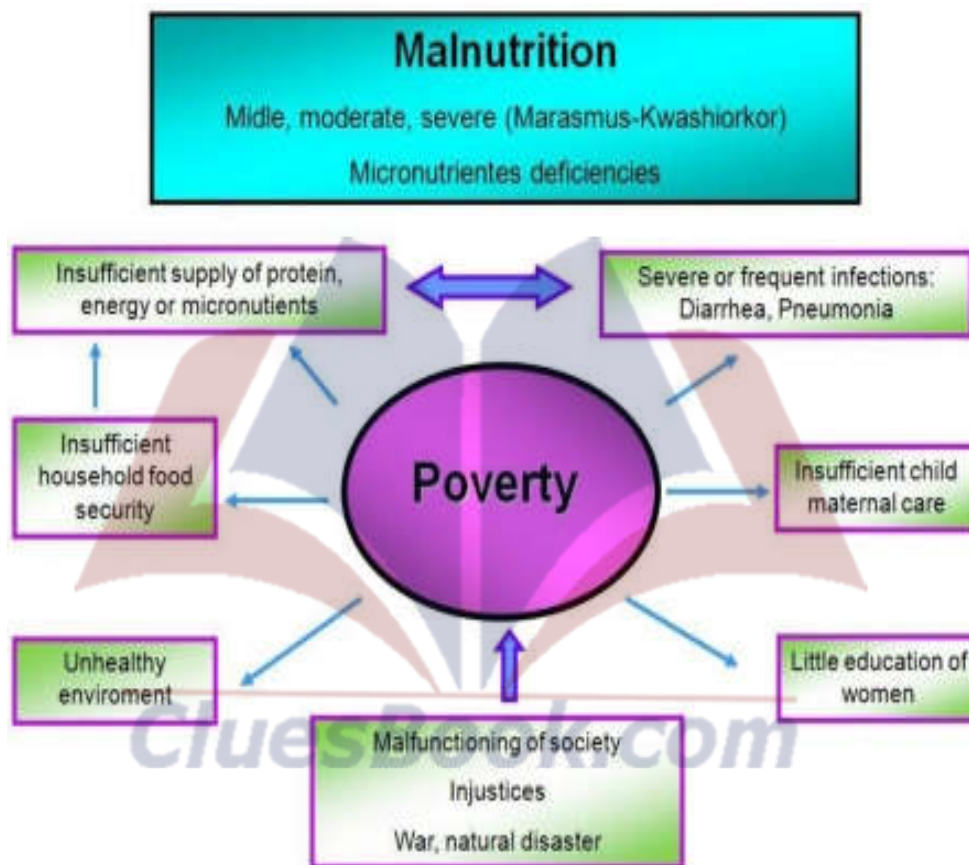
Source: Calculations based on the data of PHIS 2001-02; HIES 2004-05; PSLM 2005-06, 2007-08

TOPIC 142: WHAT CAUSES POVERTY?

Poverty may be due to national, sector-specific, community, household, or individual characteristics. This chapter summarizes some of the characteristics of the poor by region,

community, household, and individual characteristics and then discusses how regression techniques can be used to determine the factors “causing” poverty.

- First, it can be difficult to separate causation from correlation. For instance, we know that poor people tend to have low levels of education; but are they poor because they have little education, or do they have little education because they are poor? A statistical association alone is not enough to establish causality, and additional information is likely to be required
- Second, most of the “causes” of poverty that we identify in this chapter are immediate (or “proximate”) causes, but not necessarily “deep” causes. For instance, suppose that we can demonstrate that low levels of education do indeed increase the risk of poverty.



TOPIC 143: REGION LEVEL FACTORS OF POVERTY

At the regional (or countrywide) level, numerous characteristics might be associated with poverty. The relationship of these characteristics with poverty is country specific. In general, however, poverty is high in areas characterized by geographical isolation, a low resource base, low rainfall, and other inhospitable climatic conditions.

For example, many argue that economic development in Bangladesh is severely retarded because of its susceptibility to annual floods; and NGHIE a province in north-central Vietnam is poor in part because it is regularly hit by typhoons, which destroy a significant part of the accumulated stock of capital. In many parts of the world the remoteness of rural areas—which lowers the prices farmers get for their goods and raises the prices they pay for purchases because of high transport costs is responsible for generating food insecurity among the poor. Inadequate public services, weak communications and infrastructure, as well as

underdeveloped markets, are dominant features of life in rural Cambodia, as in many other parts of the world, and clearly contribute to poverty.

Other important regional and national characteristics that affect poverty include good governance; a sound environmental policy; economic, political, and market stability; mass participation; global and regional security; intellectual expression; and a fair, functional, and effective judiciary. Region-level market reforms can boost growth and help poor people, but they can also be a source of dislocation. The effects of market reforms are complex, deeply linked to institutions and to political and social structures. The experience of transition, especially in countries of the former Soviet Union, shows that market reforms in the absence of effective domestic institutions can fail to deliver growth and poverty reduction, at least initially.

TOPIC 144: COMMUNITY LEVEL DETERMINANTS OF POVERTY

As with regional characteristics, a variety of community-level characteristics may be associated with poverty for households in that community.

- At the community level, infrastructure is a major determinant of poverty. Indicators of infrastructure development often used in econometric exercises include proximity to paved roads, availability of electricity, proximity to large markets, availability of schools and medical clinics in the area, and distance to local administrative centers.
- Other indicators of community-level characteristics include average human resource development, access to employment, social mobility and representation, and land distribution.

Recently, there has been more emphasis on the importance of social networks and institutions, and “social capital,” which includes, for instance, the level of mutual trust in the community (Putnam 1995). In addition to removing social barriers, effective efforts to reduce poverty require complementary initiatives to build up and extend the social institutions of the poor. Social institutions refer to the kinship systems, local organizations, and networks of the poor and can be thought of as different dimensions of social capital. Research on the roles of different types of social networks in poor communities confirms their importance. An analysis of poor villages in north India, for example, shows that social groups play an important role in protecting the basic needs of poor people and in reducing risk (Kozel and Parker 2000). A study of agricultural traders in Madagascar shows that social relationships are central; close relationships with other traders help lower transactions costs, while longstanding ties to creditors are vital sources of security and insurance (Fafchamps and Minten 1998).

TOPIC 145: DEMOGRAPHIC DETERMINANTS OF POVERTY

Indicators of household size and structure are important in that they show a possible correlation between the level of poverty and household composition. Household composition the size of the household and characteristics of its members (such as age) is often quite different for poor and non-poor households.

The Cambodia Socio-Economic Survey (CSES) of 1993–94 shows that the poor tend to live in larger households, with an average family size of 6.6 persons in the poorest quintile compared with 4.9 in the richest quintile (Gibson 1999). Similar patterns are found in most countries, although the effect is attenuated if welfare is measured on a per adult equivalent rather than a per capita basis. The poor also tend to live in younger households, with the bottom quintile having twice as many children under age 15 per family as the top quintile, and slightly fewer elderly people over age 60. Better-off households also tend to be headed by people who are somewhat older.

The dependency ratio is the ratio of the number of family members not in the labor force (whether young or old) to those in the labor force in the household. This ratio allows one to measure the burden weighing on members of the labor force within the household. One might expect that a high dependency ratio will be associated with greater poverty.

TOPIC 146: ECONOMIC CHARACTERISTICS OF THE POOR

Apart from income or consumption which are typically used to define whether a household is poor there are a number of other economic characteristics that correlate with poverty, most notably household employment and the property and other assets owned by the household.

There are several indicators for determining household employment. Within this array of indicators, economists focus on whether individuals are employed, how many hours they work, whether they hold multiple jobs, and how often they change employment.

- The property of a household includes its tangible goods (land, cultivated areas, livestock, agricultural equipment, machinery, buildings, household appliances, and other durable goods) and its financial assets (liquid assets, savings, and other financial assets).
- These indicators are of interest because they represent the household's inventory of wealth and therefore affect its income flow.
- Furthermore, certain households, especially in rural areas, can be poor in income, but wealthy when their property is taken into consideration.

Despite its importance, property is difficult to value in practice in any reliable way.

- First, one encounters the problem of under declaration.
- Second, it is very difficult to measure certain elements of property, such as livestock. Finally, the depreciation of assets may be difficult to determine for at least two reasons:
 - The life span of any given asset is variable.
 - The acquisition of these assets occurs at different moments in each household.

Therefore, property is more difficult to use than certain other elements in the characterization of poverty.



DETERMINANTS OF POVERTY

TOPIC 147: SOCIAL CHARACTERISTICS OF THE POOR

Several social indicators are correlated with poverty and household living standards. The most widely used are measures of health, education, and shelter.

Four types of indicators are normally used to characterize health in analyzing a household's living standards. These indicators include:

- Nutritional status, for example, anthropometric indicators such as weight for age, height for age, and weight for height
- Disease status, for example, infant and juvenile mortality and morbidity rates as related to certain diseases such as malaria, respiratory infections, diarrhea, and sometimes poliomyelitis
- Availability of health care services such as primary health care centers, maternity facilities, hospitals and pharmacies, basic health care workers, nurses, midwives, doctors and traditional healers; and medical service such as vaccinations and access to medicines and medical information
- The use of these services by poor and non-poor households.

TOPIC 148: EDUCATION AND POVERTY

Three types of indicators are normally used to characterize education in an analysis of household living standards. These include

- The level of education achieved by household members (basic literacy, years of education completed);
- The availability of educational services, such as proximity to primary and secondary schools; and the use of these services by the members of poor and nonpoor households.
- For this last item, commonly used measures include children's registration in school, the dropout rate of children by age and gender and reasons for dropping out, the percentage of children who are older than the normal age for their level of education, and average spending on education per child registered.

Literacy and schooling are important indicators of the quality of life in their own right, as well as being key determinants of poor people's ability to take advantage of income-earning opportunities.

TOPIC 149: DETERMINANTS OF POVERTY THROUGH REGRESSION ANALYSIS:

There are two main types of analysis:

- Attempts to explain the level of expenditure (or income) per capita the dependent Variable as a function of a variety of variables (the "independent" or "explanatory" variables). The independent variables are typically of the type discussed above in Household and Individual-Level Characteristics.
- Attempts to explain whether a household is poor, using a logit or probit regression. In this case the independent variables are as above, but the dependent variable is binary, usually taking a value of 1 if the family is poor and 0 otherwise.

Table 8.1 Main Determinants of Poverty

Regional characteristics	Isolation or remoteness, including less infrastructure and poorer access to markets and services Resource base, including land availability and quality Weather (for example, whether typhoons or droughts are common) and environmental conditions (for example, frequency of earthquakes) Regional governance and management Inequality
Community characteristics	Infrastructure (for example, piped water, access to a tarred road) Land distribution Access to public goods and services (for example, proximity of schools, clinics) Social structure and social capital
Household characteristics	Size of household Dependency ratio (that is, unemployed old and young relative to working-age adults) Gender of head, or of household adults on average Assets (typically including land, tools, and other means of production; housing; jewelry) Employment and income structure (that is, proportion of adults employed; type of work—wage labor or self-employment; remittances inflows) Health and education of household members on average
Individual characteristics	Age Education Employment status Health status Ethnicity



TOPIC 150 AND 151: DETERMINANTS OF HOUSEHOLD CONSUMPTION LEVEL

Table 8.2 Determinants of Household Spending Levels in Côte d'Ivoire, about 1993

	Urban		Rural	
	Coefficient	t-statistic	Coefficient	t-statistic
Dependent variable: ln(expenditure/capita)				
Educational level of most educated				
male				
Elementary	0.38	5.3	0.04	0.6
Junior secondary	0.62	8.6	0.08	0.9
Senior secondary	0.80	9.6	0.05	0.4
University	0.93	9.4		
Educational level of most educated				
female				
Elementary	0.11	1.7	0.07	1.0
Junior secondary	0.24	3.1	0.27	2.2
Senior secondary	0.34	4.1		
University	0.52	4.1		
Value of selected household assets				
Home	0.06	5.3		
Business assets	0.04	3.3	0.16	4.9
Savings	0.08	4.7		
Hectares of agriculture land				
Cocoa trees			0.17	4.3
Coffee trees			0.04	1.3
Distance to nearest paved road			-0.04	-2.9
Distance to nearest market			-0.09	-3.3
Unskilled wage			0.37	6.4

Source: Adapted from Grosh and Munoz (1996, 169), based on Glewwe (1990).

TOPIC 152: EXPLANATION OF THE INDEPENDENT AND DEPENDENT VARIABLES

It is vital to choose the independent variables carefully and to be sure that they are truly exogenous. For instance, in the example above, one could have included income as an independent variable, along with education, assets, and the like. But that does not advance us much, because income is in turn determined by such variables as educational levels and household assets. In our drive to find the underlying causes of poverty, we need to dig deep to find variables that are indeed predetermined.

Some researchers prefer to use, on the left-hand side, a binary variable that is set equal to 1 if the household is poor, and to 0 otherwise. Some of the information is lost by doing this, and the resulting logit or probit regression is relatively sensitive to specification errors, which is why this is rarely the preferred approach. However, such an analysis is likely to be useful when designing targeted interventions (for example, educational vouchers for poor households) because it allows one to assess the predictive power of various explanatory variables used for means testing. It is also possible to undertake a multiple logit analysis, where the dependent variable could be in one of several categories, for instance, expenditure quintiles.

Recent research has explored more exotic forms of analysis, including nonparametric regression, classification and regression trees (CART models), and multiple adaptive regression splines (MARS models). The goal of all such efforts is to unearth a parsimonious number of determinants of poverty, and quantify their effects, even when those effects are highly non-linear.

PRO-POOR GROWTH

TOPIC 153: WORLD BANK CLASSIFICATION OF ANTI-POVERTY ACTIVITIES

The World Bank classifies its antipoverty activities into three groups:

- **Fostering opportunity:** through well-functioning and internationally open markets, and investments in infrastructure and education.
- **Facilitating empowerment:** which amounts to including people in the decision making process. This requires government accountability, strong media, local organizational capacity, and mechanisms for participation in making decisions.
- **Addressing income security:** Which tackles the problem of vulnerability. This calls for insurance programs, disaster relief procedures, and a solid public health infrastructure.

TOPIC 154: PRO-POOR GROWTH

A pro-poor growth strategy entails the removal of institutional and policy induced biases against the poor, as well as the adoption of direct pro-poor policies.

For instance, discrimination on grounds of gender, ethnicity, and religion hurts the poor more than the rich; the same can be said of artificial barriers to entry into certain trades and professions, or into the formal labor market in general.

Macro policies that tend to constrain pro-poor growth include such policies as overvalued exchange rates, big city-oriented industrial location policies, and public infrastructure spending biases toward urban areas and against rural areas. Similarly, there are micro policies that work against the poor's welfare.

Examples are monopoly powers enjoyed by some firms that result in high prices; subsidized public utilities (e.g., low water fees); state universities (low student fees) that benefit primarily the non-poor; and housing policy (rent control) that limits housing supply.

Direct pro-poor policies are also required. These include adequate public spending for basic education, health and family planning services, improved access to credit, and the promotion of small and medium enterprises.

A well-administered progressive tax system is also pro-poor. Typically, this means a heavier reliance on personal income taxation, which is progressive, rather than on indirect taxation, which is regressive. Unfortunately, in many developing countries revenue generation depends much more on indirect than on direct taxes.

TOPIC 155: IS GROWTH GOOD FOR THE POOR?

David Dollar and Aart Kraay have addressed the problem directly, in a paper entitled "Growth is Good for the Poor" (Dollar and Kraay 2002).

They gathered information on the per capita incomes of the poor (defined as those in the bottom quintile of the income distribution) and on overall per capita income. The data come from 137 countries over the period 1950–99. Dollar and Kraay were able to piece together 418 "episodes" periods with an interval of at least five years during which it was possible to measure changes in the income of the poor and of the country overall.

TOPIC 156: EMPIRICAL TEST FOR PRO-POOR GROWTH

They first regressed the log of per capita income of the poor ($\ln(\text{poor})$) on overall per capita income ($\ln(\text{income})$) and got:

$$\ln(\text{poor}) = 1.07 \ln(\text{income}) - 1.77 \quad R^2 = 0.88$$

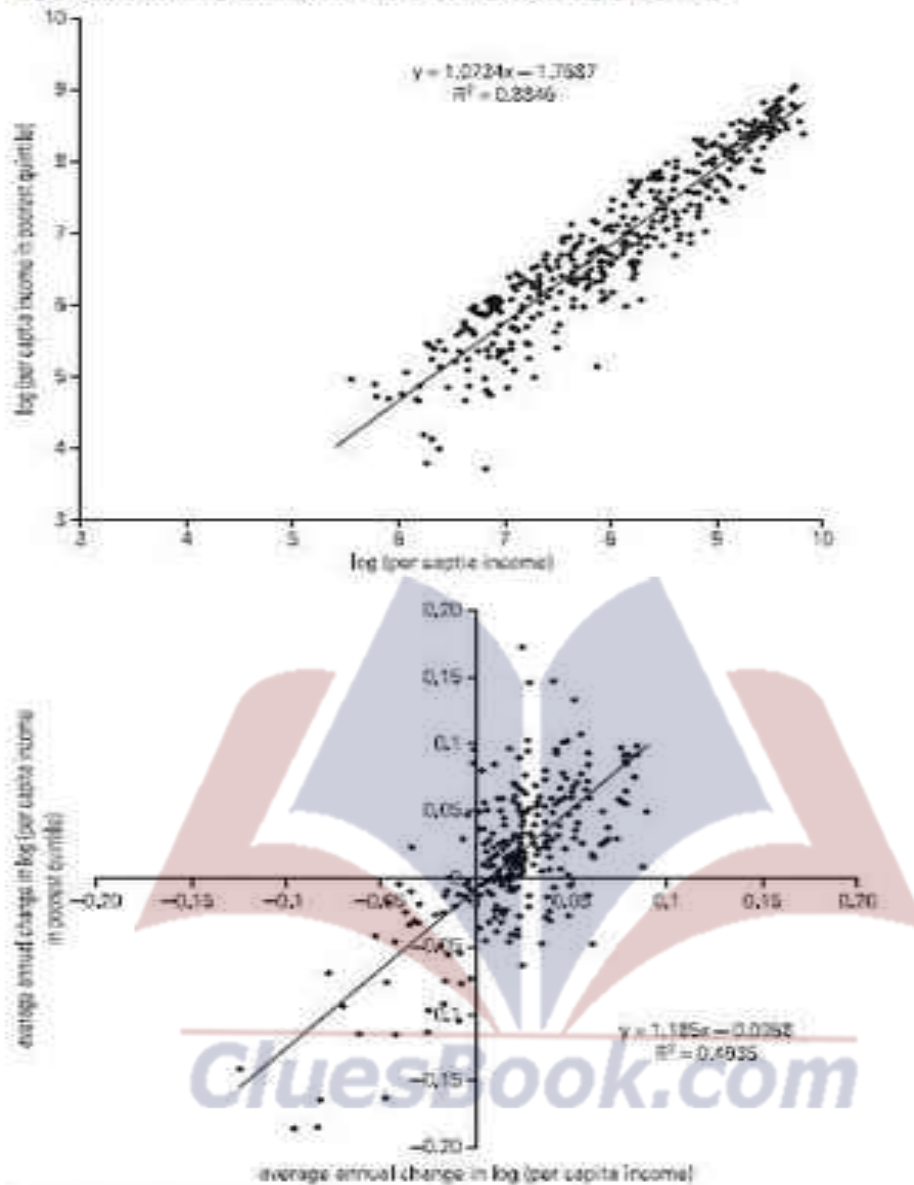
This relationship and the underlying data are reproduced in equation. Two points are worth noting:

- First, the relatively high value of R^2 means that 88 percent of the variation in the log of per capita income of the poor is associated with changes in the log of per capita income overall.
- Second, the coefficient on the $\ln(\text{income})$ term is 1.07, which means that when average incomes are 10 percent higher, the incomes of the poor can be expected to be about 10.7 percent higher. This coefficient is close to 1, so perhaps it would be wiser to conclude that the incomes of the poor tend to rise and fall in line with incomes in the country as a whole.



TOPIC 157: GRAPHICAL PRESENTATION OF PRO-POOR GROWTH

Figure 9.1. Relating the Income of the Poor to Average Incomes



Source: Dollar and Kraay (2002, figure 11).

Note: The top panel graphs the log of per capita income of those in the poorest quintile (vertical axis) against average per capita income (horizontal axis); the bottom panel graphs the changes in these magnitudes.

TOPIC 158: DETERMINANTS OF GROWTH

Table 9.1 Growth Determinants and the Incomes of the Poor

Variable	Coefficient	Standard error
ln(per capita GDP)	1.020	0.128***
(exports + imports)/GDP	-0.067	0.208
government consumption/GDP	0.401	1.013
ln(1 + inflation)	-0.216	0.077***
commercial bank assets/total bank assets	0.264	0.282
rule of law	-0.011	0.071
Memo items		
Number of observations		137
p-value for hypothesis that first coefficient $\neq 1$		0.876

Source: Dollar and Kraay 2002, table 5.

Note: Dependent variable is ln(per capita GDP) for those in the poorest quintile. The estimates shown here instrumented the ln(per capita GDP) variable, and included regional dummy variables (not shown here). Standard errors are corrected for heteroskedasticity.

*** denotes significantly different from 0 at the 1 percent level.

TOPIC 159: ROLE OF AVERAGE INCOME IN POVERTY REDUCTION

- Dollar and Kraay conclude that their results imply that “policies that raise average incomes are likely to be central to successful poverty reduction strategies” (2002, 4).
- These might include improvements in education, health, infrastructure, and the like; but “existing cross-country evidence provides disappointingly little guidance as to what mix of growth-oriented policies might especially benefit the poorest in society” (Dollar and Kraay 2002, 27).
- This does not imply that growth is the only thing that matters for improving the position of the poor, but it does show how difficult it is to identify robust policies, other than those that enhance economic growth, that might make a large and sustainable difference to those at the bottom of the income distribution.

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POVERTY, OPPORTUNITIES AND EMPOWERMENT

TOPIC 160: DETERMINANTS OF PRO-POOR GROWTH

High rates of pro-poor growth can be achieved by generating high overall growth from which the poor benefit, by achieving pro-poor distributional change, or both.

This brief focuses instead on the determinants of the distributional pattern of economic growth that is, the difference between growth and pro-poor growth.

Many of the determinants of pro-poor growth depend on country conditions, just as they do for growth.

Thus, it is not easy to generalize policy messages that apply to all settings.

Instead, pro-poor growth analysis should be seen as a toolbox for studying the country-specific determinants of growth and distributional change and for deriving country specific policy conclusions.

One important outcome of the Operationalizing Pro-Poor Growth project has been the development and application of such an analytical toolbox.

Nonetheless, the cross-country analyses and country studies have generated some important policy messages that appear to be relevant beyond the specific country context. At the most general level, pro-poor growth will require growth that is focused on sectors where poor people are active (or could become active), on regions where poor people live (or could move to), and using production factors that poor people possess.

TOPIC 161: GROWTH AND DISTRIBUTION EFFECTS OF POVERTY

Table 9.2 shows the comparison of growth and distribution effects of poverty in different countries.

Table 9.2 Growth and Distribution Effects of Poverty

Country	Starting survey year	End survey year	Headcount index (P_0) in starting year	Headcount index (P_0) in end year	Gini in starting year	Gini in end year	Decomposition of change in headcount index (P_0)		
							Growth component	Distribution component	Residual
Brazil	1990	2004	22.7	19.9	0.538	0.570	0.9	-3.7	0.0
China, rural	1996	2001	72.5	71.0	0.335	0.363	-2.2	0.4	0.2
China, urban	1996	2001	9.7	6.5	0.291	0.323	-6.9	6.0	-2.3
Jordan	1997	2002/03	74	75	0.364	0.388	-3.3	4.8	-12
Madagascar	1993	2001	46.3	61.0	0.461	0.475	13.6	3.3	-2.1
Moldova	1996	2003	51.2	29.1	0.391	0.351	-17.8	-1.8	-2.5
Nigeria	1998/97	2003	77.9	71.0	0.520	0.436	-3.6	-2.3	-10
Pakistan	1998/99	2002	13.6	12.8	0.330	0.306	7.7	-2.9	-0.3
Peru	1996	2002	28.4	32.1	0.462	0.547	-5.7	9.4	0.0
Ukraine	1996	2003	16.4	5.0	0.351	0.281	-3.9	-8.4	0.9

Source: Tables D.2 and D.4 in World Bank (2006).

TOPIC 162: ELASTICITIES OF POVERTY REDUCTION

Now define the elasticity of poverty reduction (ϵ) as the percentage change in the poverty measure divided by the percentage change in per capita income (or expenditure).

For instance, if per capita income rises by 10 percent and, as a result, the headcount poverty rate falls from 20 percent to 19 percent (that is, by 5 percent), then $\epsilon = -0.5$. We expect ϵ to be a negative number and typically find that it lies in the range of $[-3.5, -0.5]$.

TOPIC 163: LACK OF OPPORTUNITIES AS DETERMINANT OF POVERTY

The level of individual households, a lack of material opportunities is a direct cause of poverty. As Lustig and Stern (2000) put it, “poor people consistently emphasize the centrality of material opportunities: jobs, credit, roads, electricity, and markets for their produce, as well as schools, clean water, sanitation services, and health care.”

The human, physical, natural, financial, and social assets that poor people possess—or have access to—affect their prospects for escaping poverty because these assets can enable poor people to take advantage of opportunities. For example, a study of irrigation in Vietnam (van de Walle 2000a) found that there are complementarities between education and gains from irrigation, and more specifically that households with higher education levels received higher returns to irrigation.

It is widely, if not universally, believed that well-functioning markets are helpful in generating sustainable growth and expanding opportunity for the poor. This is because poor people in most countries rely on formal and informal markets to sell their labor and products, to finance their investments, and to insure against risks.

TOPIC 164: EXAMPLE OF LACK OF OPPORTUNITIES

Case studies of Chile, China, Ghana, Uganda, and Vietnam show that agricultural reforms have helped raise producer prices for small farmers by eliminating marketing boards, changing real exchange rates through broader economic reforms, lowering tariffs, and eliminating quotas.

The World Bank argues that robust economic growth is at the heart of generating opportunity. Growth, in turn, requires investment, both private and public. Private investment is seen as effective in creating jobs and labor income, and in turn is helped by a sound fiscal and monetary policy, stable investment rules, and a sound financial system. Encouragement to microenterprises—for instance, through microcredit or simplified tax and licensing procedures—and to small and medium enterprises is likely to be helpful.

Economic growth is also likely to be enhanced by opening up to international markets, especially for countries with the infrastructure and institutions to stimulate a strong supply response (for example, call centers in Ghana, coffee farmers and garment factories in Vietnam). Therefore, the market opening needs to be well designed with special attention to bottlenecks. Even with economic growth, measures may be needed to ensure that poor people can expand their assets. These measures might include scholarships for children from poor families; free health care for the poor; or land reform, including land redistribution (as in parts of Brazil) or titling (as in Vietnam since about 1990). In some countries, special efforts may be needed to address socially based inequality, such as under schooling of girls relative to boys, or the limited independence of women resulting from lack of access to productive means, or ethnic inequalities in access to public services. Ethnic inequalities can easily erupt into violence; civil war inevitably sets back economic development for a generation (Haughton 1998).

TOPIC 165: EMPOWERMENT AS DETERMINANT OF POVERTY

Broadly, empowerment refers to being able to make informed decisions and choices effectively. But there is some disagreement about the true content of empowerment. Mahatma Gandhi emphasized self-reliance; Paolo Freire (2000) stressed the need for conscientization, for helping the poor to learn about and perceive “social, political and economic contradictions” and then to stir to act against “the oppressive elements of society.” E.F. Schumacher, author of *Small is Beautiful* (1973), argues that empowerment follows when one makes up deficiencies in education, organization, and discipline.

TOPIC 166: EXAMPLE OF EMPOWERMENT

State institutions must be responsive and accountable to poor people. In nearly every country the public sector often pursues activities that are biased against poor people, and poor people have trouble getting prompt, efficient service from the public administration. Accountability is helped when there is good access to information.

Example: The Public Expenditure Tracking Survey conducted in 1996 in Uganda found that only 22 percent of the central government funds intended to support locally run schools were reaching their intended destination. By 1999–2000, after the government made the budgetary transfers public via the media and required schools to share financial information, 80–90 percent of the funds began to reach the schools for which they were intended.

TOPIC 167: DIFFERENT CONTENTS OF EMPOWERMENT IN SOCIETY

The World Bank finesses these differences by defining empowerment as “the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives” (World Bank 2002, vi).

The Bank sees the four major elements of empowerment as:

- Access to information
- Inclusion and participation
- Accountability
- Local organizational capacity



DEPRIVATION OF CAPABILITIES AND POVERTY**TOPIC 168: DEPRIVATION OF CAPABILITIES AS DETERMINANT OF POVERTY**

Amartya Sen (1999) sees poverty as consisting of a “deprivation of capabilities,” so that the poor have inadequate resources (financial, informational, and so on) to participate fully in society; in short, they are socially excluded. It follows that inclusion, which encompasses economic and political participation, is inherently part of the solution to poverty. The process of including the poor is likely to require the development of their social capital, the “features of social organization, such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam 1995, 67). Social capital takes time to build, but contributes to stronger local organizational capacity.

Good social institutions kinship, community organizations, and informal networks can play an important role in poverty reduction. For example, many development programs succeed because they mobilize local groups of project beneficiaries in program design and implementation. However, when social institutions are weak, fissures such as ethnic cleavages can explode into open conflict; most of the world’s 20 poorest countries have experienced civil war within the past generation.

TOPIC 169: SOCIAL NORMS AND PRACTICES AND POVERTY

Some social norms and practices help generate and perpetuate poverty. Discrimination on the basis of gender, ethnicity, race, religion, or social status can lead to social exclusion and create barriers to upward mobility, constraining people’s ability to participate in economic opportunities and to benefit from and contribute to economic growth.

For example, one cross-country study indicates that countries that invest in girls’ education have higher rates of economic growth (Klasen and Woolard 1999).

TOPIC 170: MEASUREMENT OF EMPOWERMENT FOR POVERTY

Empowerment is difficult to measure. The UNDP’s Gender Empowerment Measure (GEM) includes indicators such as male and female shares of parliamentary seats, managerial positions, and earned income, but also has serious limitations in that it does not include information on the informal sector, or on such items as the right to vote. By design, the GEM focuses on gender empowerment, and not specifically on empowerment of the poor.

TOPIC 171: POLICY SUGGESTIONS FOR EMPOWERMENT

To empower poor people, policies needed to facilitate active collaboration among the poor and other groups in society include strengthening the participation of poor people in political processes and local decision making; making changes in governance that make public administration, legal institutions, and public services delivery more efficient and accountable to all citizens; and removing the social barriers that result from distinctions of gender, ethnicity, race, and social status. Worthy as this sounds, it is not at all obvious how to achieve such changes, but some policies that have been suggested include the following:

- To improve access to information, encourage the development of the media. For instance, Besley and Burgess (2002) show that there is a robust link between media development and government responsiveness in India; states with higher newspaper circulation also undertake more extensive relief efforts in the wake of natural disasters.
- To increase participation and inclusion, it helps to institutionalize transparent, democratic, and participatory mechanisms for making decisions and monitoring implementation. In this context, it may also be useful to provide legal assistance to poor people who usually have limited access to the legal system.

TOPIC 172: HOW TO INCREASE ACCOUNTABILITY

Accountability is increased by strengthening the mechanisms used to monitor the performance of public administrations and by providing access to budgetary information and participatory mechanisms.

- Publication of complete and timely budgetary information. Until recently, Vietnam did not publish such information, for instance, so it was impossible to hold the government to account for how it spent its money.
- Institutional and Governance Reviews, which use surveys and other quantitative measures to analyze the functioning of public institutions.
- Citizen Report Cards, which allow citizens to express their opinions on the performance and quality of government services.
- World Bank Corruption Surveys, which are designed to extract information on corruption from households, the private sector, and public officials. Based on such a survey, for instance, Albania requested an anticorruption program to undermine patronage in judicial and civil service appointments (Orhun 2004, 7).
- Public Expenditure Tracking Surveys, which have helped ensure that budgeted funds get to their intended recipients in places such as Ghana and Uganda.
- Private Enterprise Surveys of the Business Environment, and Investor Roadmaps. These indicate the problems and costs faced by entrepreneurs.
- Participatory Poverty Assessments. Using focus groups, in-depth interviews, and other measures, Participatory Poverty Assessments complement survey data to help build a more detailed picture of the nature and roots of poverty; they have been influential in Vietnam, for instance.

TOPIC 173: HOW TO INCREASE LOCAL ORGANIZATIONAL CAPACITY

To increase local organizational capacity, it helps to do the following:

- Promote decentralization and community development to enhance the control that poor people and their communities have over the services to which they are entitled. Decentralization needs to be combined with effective participation and monitoring mechanisms.
- Promote gender equality by promoting women's representation in decision making and providing special assistance for women's productive activities.
- Tackle social structures and institutions that are obstacles to the upward mobility of poor people by fostering debate over exclusionary practices and supporting the participation of the socially excluded in political processes.
- Support poor people's social capital by assisting networks of poor people to engage with market and nonmarket institutions to strengthen their influence over policy.

DESIGN OF POVERTY ALLEVIATION STRATEGY

TOPIC 174: INCOME SECURITY FOR POVERTY ALLEVIATION STRATEGY

Poor people are exposed to a wide array of risks that make them vulnerable to income shocks and losses of well-being. Reducing poor people's vulnerability to ill health, economic shocks, natural disasters, and violence enhances well-being on its own and encourages investment in human capital and in higher-risk, higher-return activities as well.

Households and communities respond to their risk exposures through diversification of assets and sources of income, and through various types of self-insurance and networks of mutual insurance mechanisms.

For instance, some family members may travel to cities to seek work, sending remittances home; if they cannot find work they return home. Or farmers may store grain from one season to the next, in case crops fail. In a number of countries, such as Mali, some very poor rural women wear large gold ornaments in effect carrying their savings, which could be sold if necessary to tide the household over during a bad year.

Mechanisms such as these help to reduce risks or soften the impact of negative events, but the effect may be limited. To counter the incentive and information problems that exclude poor people from many market-based insurance mechanisms, the state has, in principle, a special role in providing or regulating insurance and setting up safety nets. Health, environmental, labor market, and macroeconomic policies can all reduce and mitigate risk.

TOPIC 175: LARGE ADVERSE SHOCKS AND POVERTY

Large adverse shocks economic crises and natural disasters—cause poor people to suffer not only in the short run. Such shocks undercut the ability of the poor to move out of poverty in the long run as well, by depleting their human and physical assets, which depletion may be irreversible. So it is crucial to prevent economic crises and be prepared to react quickly to natural disasters, as well as to protect poor people when these events occur. National programs to manage economy wide shocks and effective mechanisms to reduce the risks faced by poor people, as well as to help them cope with adverse shocks when they occur, are useful.

Appropriate measures might include the following:

- Formulating programs to help poor people manage risk. Micro-insurance programs, public works programs, and food transfer programs may be mixed with other mechanisms to deliver effective risk management.
- Developing national programs to prevent and respond to macro shocks— financial or natural.
- Supporting minority rights and providing the institutional basis for peaceful conflict resolution, to help prevent civil conflict and mobilize more resource into productive activities.
- Tackling health problems, including widespread illnesses such as malaria and tuberculosis, as well as moderately common but serious conditions such as HIV/AIDS.

TOPIC 176: DESIGN OF POVERTY ALLEVIATION STRATEGY

The World Bank (2000, 40) argues for a modular approach, “with different schemes to cover different types of risk and different groups of the population,” and where “the tools include health insurance, old age assistance and pensions, unemployment insurance, workfare programs, social funds, microfinance programs, and cash transfers.” These safety nets should not only support immediate consumption needs, but also “protect the accumulation of human, physical, and social assets by poor people.”

There is no simple, universal blueprint for implementing this strategy for poverty alleviation and reduction. Each country needs to prepare its own mix of policies, reflecting national priorities and local realities. But there are examples of approaches that work, particularly at the level of individual projects, as the optimistic assessment by Smith (2005) illustrates.

TOPIC 177: PAKISTAN EXAMPLE; POVERTY REDUCTION STRATEGY PAPERS (PRSP)

Any good poverty reduction plan begins with an analysis that identifies the nature and evolution of poverty, a profile of poor people, and the factors that contribute to poverty. Building on an accurate understanding of poverty, the strategy for poverty reduction has to prioritize the poverty reduction goals and take into account complementarities and compatibilities of various policy tools. Then specific implementation modules, including resource allocation and monitoring mechanisms, need to be designed.

In the years following independence, the government of Tanzania focused on three development problems: ignorance, disease, and poverty. National efforts to tackle these problems were initially channeled through centrally directed, medium-term and long-term development plans; despite high levels of foreign aid, these efforts were a complete failure, and poverty was higher in 1990 than at the time of independence.

In June 2005, Tanzania issued its “National Strategy for Growth and Reduction of Poverty 2005–2010,” known more commonly by its Swahili acronym MKUKUTA. The strategy is divided into three main clusters:

- Growth and the reduction of income poverty
- Improvement in the quality of life
- Social well-being, and governance and accountability

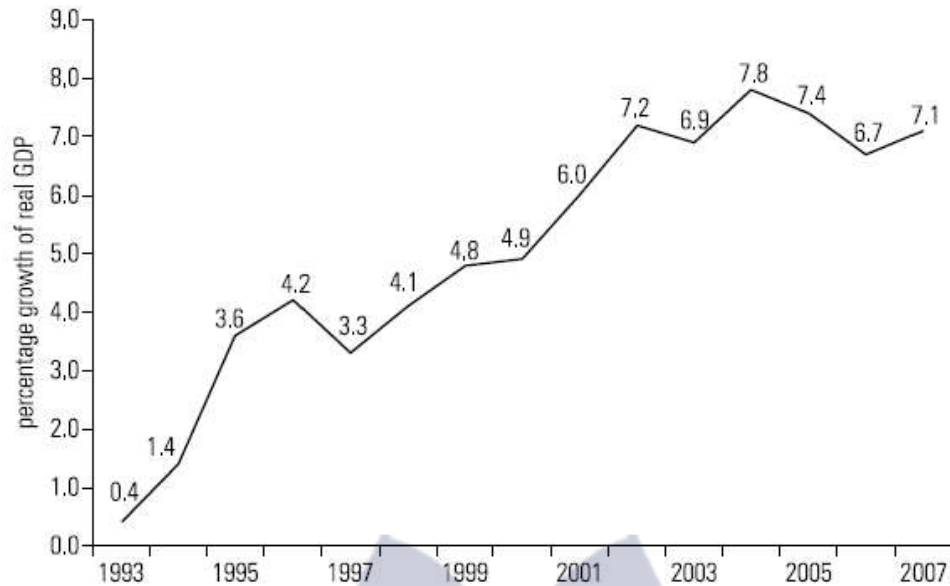
TOPIC 178: SUMMARY OF PRSP-II

Table 9.3 Summary of Tanzania's National Strategy for Growth and Reduction of Poverty (MKUKUTA)

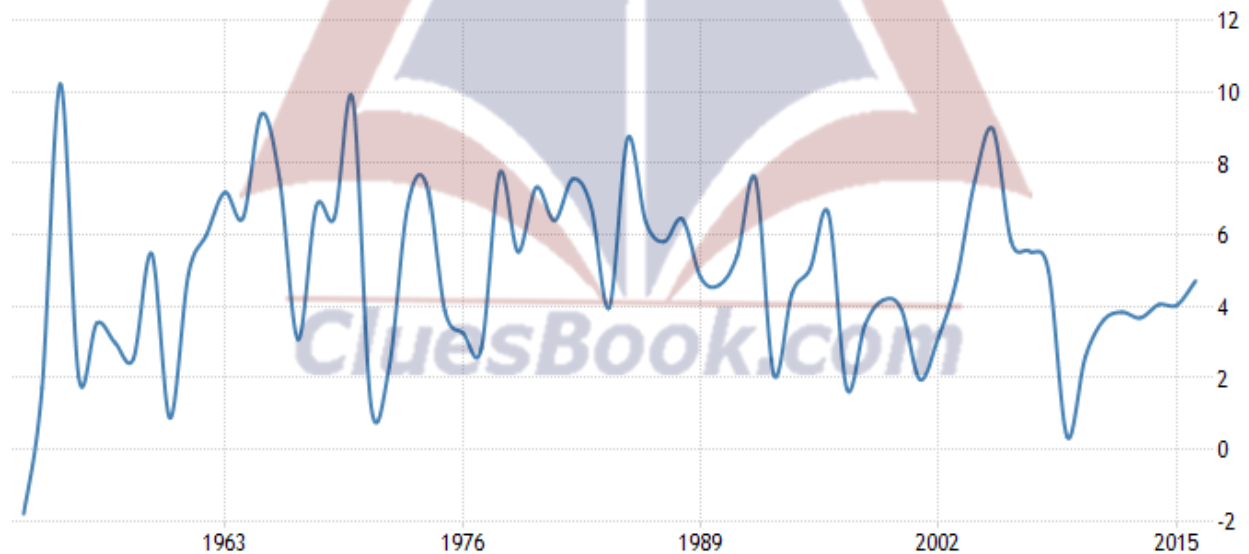
Cluster 1: Growth and reduction of income poverty	
Broad outcomes	Achieve and sustain broad-based and equitable growth
Goal 1	Ensure sound economic management
Goal 2	Promote sustainable and broad-based growth
Goal 3	Improve food availability and accessibility at the household level
Goals 4 and 5	Reduce income poverty, both for men and women, and in urban and rural areas
Goal 6	Provide reliable and affordable energy to consumers
Cluster 2: Improvement of quality of life and social well-being	
Broad outcomes	Improve quality of life and social well-being, with particular focus on the poorest and most vulnerable groups; and reduce inequalities (for example, education, survival, health) across geographic, income, age, gender, and other groups
Goal 1	Equitable access to quality primary and secondary education; universal literacy among men and women; expansion of higher, technical, and vocational education
Goal 2	Improved survival, health, and well-being of all children and women, especially for vulnerable groups
Goal 3	Increased access to clean, affordable, and safe water; sanitation; decent shelter; and a safe and sustainable environment
Goal 4	Adequate social protection and provision of basic needs and services for the vulnerable and needy
Goal 5	Effective systems to ensure universal access to quality and affordable public services
Cluster 3: Governance and accountability	
Broad outcomes	Good governance and the rule of law; accountability of leaders and public servants; democracy, and political and social tolerance; peace, political stability, national unity, and social cohesion deepened
Goal 1	Structures and systems of governance as well as the rule of law to be democratic, participatory, representative, accountable, and inclusive
Goal 2	Equitable allocation of public resources with corruption effectively addressed
Goal 3	Effective public service framework in place to provide foundation for service delivery improvements and poverty reduction
Goal 4	Rights of the poor and vulnerable groups are protected and promoted in the justice system
Goal 5	Reduction of political and social exclusion and intolerance
Goal 6	Improve personal and material security, reduce crime, and eliminate sexual abuse and domestic violence
Goal 7	Natural cultural identities to be enhanced and promoted

TOPIC 179: GDP GROWTH; TRENDS AND ANALYSIS

Figure 9.2 Real GDP Growth, Tanzania, 1993–2007 (in Constant Prices)



Sources: Data since 1998 from Tanzania (2008, 15); earlier data from Tanzania (2007, 4).



At the heart of the strategy is a strong emphasis on sustaining economic growth, which MKUKUTA states should be in the range of 6–8 percent annually. In this respect, Tanzania has seen a remarkable turnaround. In contrast to the anemic rates of economic growth in the 1990s, the real increase in GDP has exceeded 6 percent annually in every year since 2001, as figure 9.2 shows. This has been achieved in the context of sound macroeconomic management, including fairly modest rates of inflation, and adequate fiscal discipline. However, the growth has been geographically uneven, and most private credit goes to “a small number of enterprises with solid collateral in key urban areas” (Tanzania 2007, 9). Although Tanzania achieves food self-sufficiency in most years it exported food in 2006–07 almost all agriculture is dependent on

rainfall, and some regions and districts have experienced seasonal food shortages in the months before the harvest.

TOPIC 180: WHY GDP GROWTH OF PAKISTAN IS INSTABLE?

There exists overwhelming empirical evidence across countries and across time that political instability is negatively related to economic growth and performance. Political instability lowers private investment, slows economic growth and gives rise to unemployment and poverty. Political instability breeds corruption, bad-governance, limits policy-makers' vision and creates volatility in economic performance.

Pakistan's current state of the economy is the mirror image of the adverse consequences of political instability. Pakistan is witnessing its investment declining, economic growth slowing, unemployment rising, millions slipping below poverty line, women and children dying in stampedes for a few kgs of Atta, exchange rate depreciating and fueling inflation and contributing to the surge in public debt.

Pakistan also saw its relations with international financial institutions deteriorating, the Friends of Pakistan showing reluctance in providing financial support and hence overall balance of payment turning negative, foreign investors losing confidence in Pakistan's economy and economic managers with consequent nose-diving of foreign investment. In short, a relatively stable and resurgent economy has been destroyed in the last few years owing mainly to bad-governance bred by political instability.



GLOBAL COMPARISON OF POVERTY STRATEGIES

TOPIC 181: INTERNATIONAL COMPARISON OF POVERTY, IS IT A COMPLEX PHENOMENON?

The central target of the Millennium Development Goals (MDGs) is to halve, between 1990 and 2015, the proportion of people in developing countries whose income is less than \$1/day. To measure progress toward this goal it is necessary to compare poverty rates across countries.

The World Bank measures world poverty by:

- Establishing a dollar-valued poverty line (now \$1.25 per person per day in 2005 dollars).
- Converting it to local currencies using purchasing power parity (PPP) exchange rates.
- Using local consumer price indexes to determine the local-currency poverty line for any given year.
- Estimating Lorenz curves from household survey data.
- Thereby inferring local poverty rates and levels.
- Aggregating the results by region and worldwide.

The World Bank reports that the \$1.25/day poverty rate fell from 52 percent of the population of developing countries in 1981 to 25 percent by 2005, with the biggest decline occurring in East Asia (from 78 percent to 17 percent) and almost no reduction in Sub-Saharan Africa.

This approach has been criticized for using a poverty rate that is not rooted in theory; for being overly sensitive to measurements of PPP exchange rates; for not using poor-person price indexes to inflate poverty lines locally; and for not adequately recognizing the uncertainties in poverty measurement in India and China, where half of the population of the developing world lives. An alternative approach would be to compute poverty levels and rates based on basic needs, for each country but this approach has its own methodological problems, and is time and labor intensive.

Household survey data understate income (and expenditure). When reconciling the results with national accounts it is tempting, but often misleading, to gross up the income of every household by the same proportion to achieve consistency with the measure of national income. Over the long run, economic growth powers poverty reduction, but in the short run the link is weaker.

TOPIC 182: GLOBAL COMPARISON OF POVERTY STRATEGIES

This entry is concerned with extreme poverty. The World Bank is the main source for global information on extreme poverty today and it sets the International Poverty Line. The poverty line was revised in 2015 since then, a person is considered to be in extreme poverty if they live on less than 1.90 international dollars (int.-\$) per day. This poverty measurement is based on the monetary value of a person's *consumption*. Income measures, on the other hand, are only used for countries in which reliable consumption measures are not available.

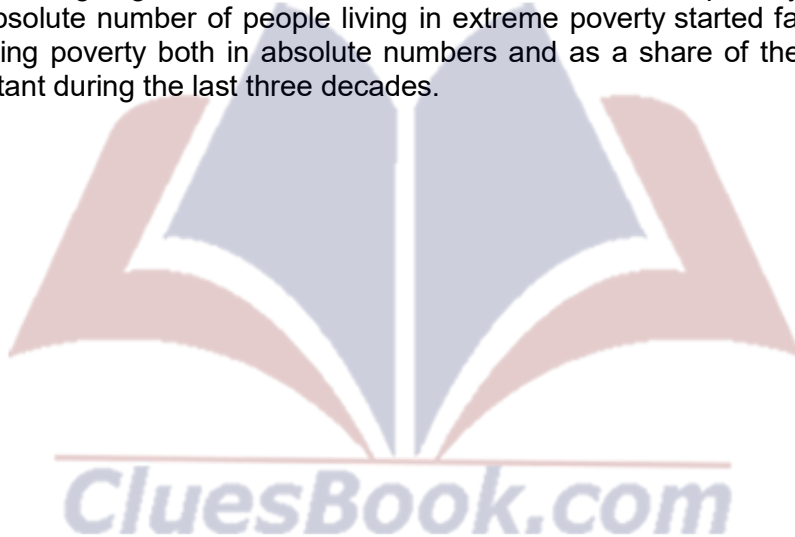
A key difficulty in measuring global poverty is that price levels are very different in different countries. For this reason, it is not sufficient to simply convert the consumption levels of people in different countries by the market exchange rate; it is additionally necessary to adjust for cross-country differences in purchasing power. This is done through Purchasing Power Parity adjustments.

It is important to note that the International Poverty Line is extremely low. Indeed, extreme poverty is an adequate term for those living under this low threshold. Focusing on extreme poverty is important precisely because it captures those most in need. However, it is also

important to point out that living conditions well above the International Poverty Line can still be characterized by poverty and hardship. Accordingly, in this entry we will also discuss the global distribution of people below poverty lines that are higher than the International Poverty Line of 1.90 int.-\$.

Poverty is a concept intrinsically linked to welfare – and there are many ways in which one can try to measure welfare. In this entry we will focus mainly (though not exclusively) on poverty as measured by 'monetized' consumption and income, following the approach used by the World Bank. But before we present the evidence, the following introductory sub-section provides a brief overview of the relevance of this approach.

The available long-run evidence shows that in the past, only a small elite enjoyed living conditions that would not be described as 'extreme poverty' today. But with the onset of industrialization and rising productivity, the share of people living in extreme poverty started to decrease. Accordingly, the share of people in extreme poverty has decreased continuously over the course of the last two centuries. This is surely one of the most remarkable achievements of humankind. During the first half of the last century, the growth of the world population caused the absolute number of poor people in the world to increase, even though the share of people in poverty was going down. After around 1970, the decrease in poverty rates became so steep that the absolute number of people living in extreme poverty started falling as well. This trend of decreasing poverty both in absolute numbers and as a share of the world population has been a constant during the last three decades.



TOPIC 183: MILLENNIUM DEVELOPMENT GOALS (MDG'S)



TOPIC 184: CHOICE OF POVERTY LINE; INCOME VS CONSUMPTION

There tends to be a preference for measuring poverty using consumption, especially for developing countries in which participation in the formal labor market (and the associated income paper trail) is generally limited.

- First, it is consumption that appears in utility functions.
- Second, consumption corresponds more closely to “permanent income.”
- Third, the conceptual advantage of consumption over income is strengthened by data considerations.

The measurement of income suffers from deliberate understatement, measurement error, and omission of key components (for example, capital gains on infrequently marketed assets). However, consumption also poses difficult measurement issues, especially bearing in mind that it requires data on both quantities and prices. There is relatively good experience worldwide with measurement of nondurable consumption. But we should also be including the service flow from all durable goods, and only some household surveys attempt to do this. With a perfect rental market in durable goods, this would be easy: consumption service flow would correspond to the market or shadow rent on the durable goods, which in turn would equal depreciation plus opportunity cost. But durable goods markets exist for few goods and can be thin even when they do exist.

TOPIC 185: POVERTY COMPARISON OF DIFFERENT REGIONS

Table 10.1 Headcount Indexes: Percentage of Population in Developing Countries Living below \$1.25/Day

Region	1981	1984	1987	1990	1993	1996	1999	2002	2005
East Asia and Pacific	77.7	65.5	54.2	54.7	50.8	36.0	35.5	27.6	16.8
China	84.0	69.4	54.0	60.2	53.7	36.4	35.6	28.4	15.9
Europe and Central Asia	1.7	1.3	1.1	2.0	4.6	4.6	5.1	4.6	3.7
Latin America and the Caribbean	11.5	13.4	12.6	9.8	9.1	10.8	10.8	11.0	8.4
Middle East and North Africa	7.9	6.1	5.7	4.3	4.1	4.1	4.2	3.6	3.6
South Asia	59.4	55.6	54.2	51.7	46.9	47.1	44.1	43.8	40.3
India	59.8	55.5	53.6	51.3	49.4	46.6	44.8	43.9	41.6
Sub-Saharan Africa	53.7	56.2	54.8	57.9	57.1	58.7	58.2	55.1	51.2
All developing countries	51.8	46.6	41.8	41.6	39.1	34.4	33.7	30.6	25.2
Memo items									
LDC poverty rate at \$1.00 a day	41.4	34.4	29.8	29.5	27.0	23.1	22.8	20.3	16.1
LDC poverty rate at \$2.00 a day	69.2	67.4	64.2	63.2	61.5	58.2	57.1	53.3	47.0
LDC poverty rate at \$2.50 a day	74.6	73.7	71.6	70.4	69.2	67.2	65.9	62.4	56.6

Source: Chen and Ravallion 2008, table 7. Also available on the World Bank's PovcalNet.

Note: LDC = Less-developed country. \$1.25 refers to prices in 2005, converted to local currency equivalents using purchasing power parity exchange rates.

TOPIC 186: ESTIMATION OF POVERTY IN DEVELOPING COUNTRIES

To compare (absolute) poverty across countries, it is first necessary to establish a poverty line. Chen and Ravallion (2008) argue that an appropriate standard is US\$1.25 per person per day, in 2005 prices. They base this on the mean of the poverty lines in the poorest 15 countries in their sample. The mean level of consumption per person in these countries was US\$1.40 per day in 2005; once consumption per person rises above about US\$2.00 per day, the poverty line itself begins to rise. It appears that the poverty line is robust to the choice of the set of poor countries used to compute it.

Before these recent revisions, the World Bank used a “dollar a day” poverty line. It was actually based on the purchasing power of US\$1.08 per person per day in 1993, and in their earlier work Chen and Ravallion (2001, 2004) argued that this line was representative of the poverty lines used in very poor countries at that time.

TOPIC 187: COMPUTING GDP PER CAPITA IN PURCHASING POWER PARITY TERMS

To see how this works, suppose that we want to compare two countries, the “USA” (which uses dollars and has a million people) and “India” (which uses rupees and has 2 million people). For simplicity, suppose that these economies only produce wheat and education, with the latter only involving the cost of teachers.

Assume that the USA has 1,000 teachers, each paid \$30,000 annually; and produces 40,000 tons of wheat annually at \$250/ton. As table 10.2 shows, total GDP will then be \$40 million, for a GDP per capita of \$40 per year.

Assume further that the exchange rate is 46 rupees per dollar. Wheat is a tradable good, so roughly should cost the same everywhere. Thus, in India a ton of wheat will cost 11,500 rupees. And let us suppose that teachers in India are paid 36,800 rupees annually (equivalent to \$800

annually when converted at the exchange rate). No doubt, many Indian teachers would like to move to the USA to earn a higher salary, but visa restrictions do not permit this; thus, the salary differential persists. As may be seen from table 10.2, total GDP will be 174.8 million rupees, or 87.4 rupees per capita.

Table 10.2 Computing GDP per Capita in Purchasing Power Parity (PPP) Terms

	USA		India	
	Price (\$)	Quantity	Price (Rs)	Quantity
Teachers	30,000	1,000	36,800	1,000
Wheat	250	40,000	11,500	12,000
GDP	\$40 million		Rs 174.8 million = \$3.8 million at 46 Rs/\$	
Population	1,000,000		2,000,000	
GDP/capita	\$40		Rs 874 = \$1.90 at 46 Rs/\$	
GDP/capita, U.S. prices	\$40		\$18.50	
GDP/capita, Indian prices	Rs 496.8		Rs 874	

TOPIC 188: SURVEY DATA AND NATIONAL ACCOUNTS FOR POVERTY ESTIMATES

Standard measures of poverty are constructed from household budget surveys (HBS).

A typical HBS is designed to be a representative sample (for example, via the most recent census). But even using a representative sample as a basis, the sample drawn from it can be systematically biased. There are actually two problems:

- Non-response bias. There is strong evidence that rich households are less likely to comply with HBS reporting.
- Underreporting bias. It is a general rule that richer households, when they do respond to a survey, are more likely to understate their true income (or expenditure).

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DIFFERENCES IN POVERTY ESTIMATES**TOPIC 189: WHY POVERTY ESTIMATES DIFFER IN DIFFERENT NATIONAL ACCOUNTS DATA SETS**

- Part of the difference in consumption measured by the HBS and by national accounts reflects different concepts of consumption.
- National accounts, but typically not HBSs, measure the imputed rent on housing, imputed financial intermediation (the savings-lending interest rate gap), and consumption by nonprofits.
- The HBS does provide a better stock-flow link than the national accounts (which do not measure changes in stocks at all), so in principle, the HBS allows “sustainable” consumption out of financial income to be separated from consumption resulting from drawing down assets.
- However, the practical usefulness of this feature is limited by the fact that households may not report the relevant data correctly.
- Furthermore, neither source properly measures consumption of publicly provided goods (such as schooling), access to which plausibly varies with income.



TOPIC 190: ILLUSTRATING THE EFFECTS OF RESPONSE BIAS AND UNDERREPORTING

Table 10.3 Illustrating the Effects of Response Bias and Underreporting

	Individual number												Headcount index P_0 (percent)
	1	2	3	4	5	6	7	8	9	10	11	12	
Response bias													
True income/capita	80	100	110	121	140	220	270	310	400	490	620	750	33.3
Observed income/capita with response bias	80	100	110	121	140	220	270	310	400	490	620	Not reported	36.4
Scaled income/capita to adjust for response bias	101	126	139	153	177	278	341	391	505	618	783	—	18.2
Underreporting													
True income/capita	80	100	110	121	140	220	270	310	400	490	620	750	33.3
Observed income/capita with underreporting	80	100	108	121	125	220	250	300	400	450	560	600	36.4
Scaled income/capita to adjust for under-reporting	87	109	118	132	136	240	272	327	436	490	610	654	25.0

Source: Author's illustration.

Note: To rescale for response bias, divide the sum across individuals of true income per capita by the sum across individuals of observed income per capita, then multiply by the observed income per capita for each individual. A similar adjustment is made to rescale for underreported income. The poverty line is 130.

TOPIC 191: DEBATE 1: IS WORLD POVERTY FALLING?

The current debate about poverty trends is centered on the appropriate measure of consumption. Bhalla (2002) argues that the national accounts measure is more accurate. Thus, he measures the distribution of consumption from the HBS, but adjusts the level upward to correspond to the national accounts. This method results in a much lower level of measured poverty in India, because the divergence between the two sources is severe in India; and the method predicts much more optimistic trends in poverty reduction than standard projections. In fact, it implies that the world has already met, or will soon meet, the MDGs for poverty

$$GDP = C + I + G + X - IM$$

Where, C is consumption spending, I is investment, G is government spending on goods and services, X is exports, and IM is imports.

In most cases, consumption spending is estimated as a residual, obtained from estimated final production (that is, GDP) less net exports, investment, and government consumption (for which relatively good data exist). For a poor country, the production estimate begins as physical volume (for example, projected crop yields multiplied by estimated crop area), and is then converted to values. This is coupled with a fixed coefficient assumption for the rest of the

production sector (for example, the allocation of goods to intermediate versus final usage). Notice the multiple entry points for error.

TOPIC 192: DEBATE 2: IS WORLD POVERTY REALLY FALLING?

The World Bank's estimates of the fall in poverty since the early 1980s have been criticized by Sanjay Reddy and his coauthors (Pogge and Reddy 2003; Reddy and Minoiu 2006; Reddy, Visaria, and Asali 2006), and while few of the points they raise are new, they have argued them with considerable vigor.

To recap, the methodology used by the World Bank (Chen and Ravallion 2004, 2008):

- Picks a poverty line (now \$1.25 per person per day in 2005 prices)
- Uses PPP exchange rates to translate this into poverty lines in domestic currencies in 2005
- Uses domestic consumer price indexes to find the poverty line, in domestic currencies, for years other than 2005
- Applies the poverty line to expenditure distribution data that have been collected by 675 household surveys in 116 developing countries; where possible, original survey data are used, but often the computations are based on fitting Lorenz
- curves to published tabulated data from the surveys, to establish the number and proportion of people who are poor
- Establishes poverty rates and levels for three-year intervals, using interpolation for those cases where household surveys were undertaken on "off" years
- Aggregates the numbers for individual countries to provide poverty rates and levels by broad region and worldwide

TOPIC 193: CHOICE OF POVERTY LINE

Pogge and Reddy (2003) argue that the original "\$1/day" poverty line—in effect, \$1.08 per person per day in 1993 prices—is too low. They claim that this level is arbitrary and is not properly rooted in a "capabilities" (or basic needs) approach to measuring poverty, and they suggest that one could hardly survive on such a small amount in the United States; by implication, if this poverty line is appropriately translated into other currencies, it would be difficult to survive at such a low poverty line in those currencies, too. The revision of the poverty line to US\$1.25 in 2005 prices would not alter this criticism.

Table 10.4 Poverty Lines Using \$1/Day and \$2/Day and Basic Needs Measures

Poverty line	Nicaragua, 1998 (cordobas)	Tanzania, 2000/01 (shillings)	Vietnam, 1993 (dong)	Vietnam, 1998 (dong)
\$1/day	4,017	147,614	629,341	953,794
\$2/day	8,034	295,227	1,258,682	1,907,588
Cost of basic needs	3,018	80,365	1,160,363	1,758,581

TOPIC 194: USE OF PPP EXCHANGE RATES

There are two further distinct issues.

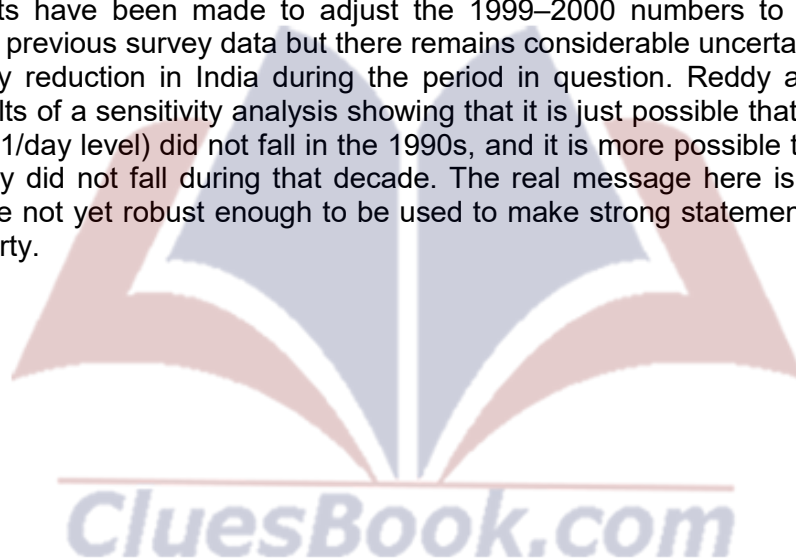
- The first involves the stability of PPP exchange rates over time, and the appropriateness of using an "average" PPP exchange rate. Pogge and Reddy (2003) note that when a new set of PPP exchange rates was published for 1993, superseding those of 1985, they led to considerable changes in measured poverty rates (using the \$1/day poverty line); a similarly large set of revisions occurred when the 2005 PPP exchange rates were introduced.

- The second problem is that the World Bank uses a PPP exchange rate that is applied to a broad basket of goods and services, and not necessarily the basket of goods and services that is relevant for poor households. Pogge and Reddy (2003) suggest that poverty (measured using the \$1/day standard) is understated as a result, on the grounds that the poor mainly consume tradable goods, so the use of a PPP exchange rate over adjusts for price differentials. However, this is by no means self-evident, and merits further study.

TOPIC 195: APPLICATION OF POVERTY LINE ON HOUSEHOLD SURVEY DATA SETS

About half of all the people in the developing world live in China and India alone. It follows that the evolution of world poverty will depend heavily on the course of poverty in these two countries. Unfortunately, the data on poverty for these two countries have some serious problems. The surveys done in China in the 1980s were of questionable quality; and until recently there was no direct measure of China's PPP exchange rate.

A change in the survey methodology used in the "thick" round of the Indian National Sample Survey in 1999–2000 appeared to imply that poverty in India had fallen but little in the 1990s, which was hardly plausible given the rapid economic growth experienced during that decade. A number of efforts have been made to adjust the 1999–2000 numbers to make them more comparable with previous survey data but there remains considerable uncertainty about the true extent of poverty reduction in India during the period in question. Reddy and Minoiu (2006) present the results of a sensitivity analysis showing that it is just possible that the world poverty rate (using the \$1/day level) did not fall in the 1990s, and it is more possible that the number of people in poverty did not fall during that decade. The real message here is that measures of world poverty are not yet robust enough to be used to make strong statements about progress in reducing poverty.



ANALYSIS OF POVERTY OVER TIME

TOPIC 196: ANALYSIS OF POVERTY OVER TIME

It is often necessary to measure how poverty changes over time, if only to monitor and evaluate the effects of specific shocks, policies, or projects on poverty.

- Changes in poverty rates are typically based on comparisons of cross-sectional data.
- In some cases, however, it is possible to collect panel data for which the same household (or person) is surveyed at two or more points in time.
- Panel surveys have some important advantages. Only with panel data can one measure who moves in to and out of poverty over time.
- The persistently poor and the chronically poor (who are poor on average, but occasionally escape poverty for a while) need help to raise their income or consumption levels; the transient poor, who sometimes outnumber the chronically poor, may have a greater need for help with smoothing their consumption profiles.
- The substantial movement of people in to and out of poverty can be captured in the form of a transition matrix.
- Panel data allow a more accurate measurement of whether poverty has changed over time, because paired tests become possible.
- They also have econometric advantages, often allowing one to avoid bias due to unobservable factors and to avoid the problems of endogenous program placement and selective migration in evaluating the impact of government programs.
- Panel surveys have drawbacks, too.
 - They are subject to attrition bias, as respondents gradually drop out of the panel; they may become less representative over.
 - Time of the population they are supposed to reflect; and they require considerable managerial skills and expense. Nor is there any entirely satisfactory way to track households as they divide and re-form over time.

TOPIC 197: TYPES OF POVERTY OVER TIME

There are three main ways to measure what happens to poverty over time:

1. Appropriate questions in a single cross-section survey.
2. Repeated cross-sectional surveys.
3. Panel data.

TOPIC 198: PANEL DATA IN POVERTY OVER TIME

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They also have econometric advantages, often allowing one to avoid bias due to unobservable factors and to avoid the problems of endogenous program placement and selective migration in evaluating the impact of government programs.

Panel surveys have drawbacks, too.

They are subject to attrition bias, as respondents gradually drop out of the panel; they may become less representative over time of the population they are supposed to reflect; and they require considerable managerial skills and expense. Nor is there any entirely satisfactory way to track households as they divide and re-form over time.

TOPIC 199: SOURCES OF INFORMATION ON POVERTY OVER TIME

A single cross-sectional survey can provide a snapshot of poverty at one point in time. Helpful as this is, it does not allow one to track the evolution of a household's poverty status over time.

Information on the “dynamics of poverty” is needed for a number of purposes, including the following:

- Distinguishing households that are poor occasionally from those that are poor all the time. This is of practical importance, because the types of intervention relevant for dealing with persistent and transient poverty are likely to be different.
- Monitoring and evaluating the effect of a specific shock, policy, or project on poverty—for instance, the degree to which a microcredit scheme might help the poor.
- Tracking the evolution of poverty over time, which would presumably also allow one to adjust the way in which poverty alleviation is targeted.

There are three main ways to measure what happens to poverty over time:

- Appropriate questions in a single cross-section survey.
- Repeated cross-sectional surveys.
- Panel data.

TOPIC 200: QUESTIONS USED IN CROSS SECTIONAL SURVEYS

- In this case, we have information on a sample of households or individuals at a single point in time.
- In addition to asking for information about current living standards, one could include some questions about living standards in the past, such as “is your income higher now than it was a year ago?” or “by how much has your income changed since last year?”
- This is the least satisfactory way to get a measure of how poverty or living standards have evolved, because few people can remember their situation a year before with any degree of accuracy.
- On the other hand, if a country is hit by a shock such as a drought, and one wants to get an idea of what segments of society were hardest hit, but there is no pre-crisis survey information, then this is the only approach that will yield any worthwhile information.

TOPIC 201: REPEATED CROSS SECTIONAL SURVEYS IN PAKISTAN AND IN THE WORLD

The most common way that poverty is tracked is by using the results from two or more household surveys over time. To allow for comparisons over time, the questions need to be comparable in each wave of the survey.

Examples of such surveys include the following:

- The annual national labor force survey in Indonesia (SAKERNAS)
- The Malaysian household income surveys
- The U.S. census long form (based on a longer questionnaire sent to a sample of households in the context of the decennial census)
- The Cambodia socioeconomic surveys
- PSLM Pakistan
- MICS Pakistan
- PDHS, etc

TOPIC 202: PANEL DATA IN POVERTY ESTIMATIONS

When a survey is repeated, and we have multiple observations for the same person (or household, or firm, or community), then we have panel data. There are a number of different ways to design a panel. Among the most common:

- **Use a sample of households.** Here the sampling unit is the household, and subsequent rounds of the survey return to the same households each time. This is probably the commonest form of panel, but is not without problems. Some effort has to be made to locate households that have moved.

- **Use a sample of individuals.** Given that households change shape and size over time, it is frequently more satisfactory to sample individuals. The biggest problem in practice is keeping track of individuals over time, an expensive process.
- **Constructing a panel from repeated cross-sections.** If there are repeated cross-sections that sample the same set of communities (for example, villages, districts, city wards), then one could aggregate the data to the community level. In this case, the observational unit is the community, and there is information on the community over time.
- **Some surveys use a rotating panel.** For round 1, a sample of households is chosen; in round two, a fraction (usually about half) of the original households are resurveyed, and a new set of households added to the sample; in round three the new households are resurveyed and the remaining original households replaced by another set of households; and so on.



ADVANTAGES AND DISADVANTAGES OF PANEL SURVEYS

TOPIC 203: ROTATING PANEL IN POVERTY OVER TIME

A sample of households is chosen; in round two, a fraction (usually about half) of the original households are resurveyed, and a new set of households added to the sample; in round three the new households are resurveyed and the remaining original households replaced by another set of households; and so on.

Example: The first living standards survey in Côte d'Ivoire was undertaken in 1985 using a sample of 1,600 households. In 1986, about 800 of these households were resurveyed, and 800 new households added to give a total second-round sample of 1,600.

TOPIC 204: ADVANTAGES OF PANEL SURVEYS-I

Only panel data allow one to measure transitions over time—that is, gross changes. For instance, suppose we want to know how many people moved out of poverty between 1993 and 1998, and how many moved into poverty over the same period. Repeated cross-sectional data only allow us to compute the net effects (that is, the old and new poverty rates), while the panel data show the gross movements.

In this context, a common issue that is addressed with panel data is whether a household's poverty is transient or persistent; we discuss this issue in more detail below. And if we want to know who is most likely to move in to or out of poverty over time, then panel data are helpful.

TOPIC 205: ADVANTAGES OF PANEL SURVEYS-II

With panel data there is less reliance on retrospective reporting.

For instance, to compute true income, we need (in principle) data on the household's assets both at the time of the survey, and a year before. Given the tricks of memory ("people telescope the past"), the data for a year ago are unreliable. But if the household were surveyed a year earlier, then reasonably reliable information on those assets exists.

Example: Vijverberg and Haughton (2004) constructed a panel of household enterprises using data from the VLSS of 1993 and 1998. To get an accurate idea of how enterprise performance evolved, it was essential to have firsthand information, drawn from both surveys, and not to rely on retrospective reporting based merely on questions in the 1998 survey.

TOPIC 206: ADVANTAGES OF PANEL SURVEYS-III

Panel data allow one to compare changes in the means of variables (such as expenditure per capita) more precisely, because one can use a paired t-test rather than the less powerful unpaired t-test. This may be an advantage if there was relatively little change between one survey and the next the Côte D'Ivoire LSMS surveys come to mind and so the greatest possible precision is needed when comparing the results of one round to those of the next.

TOPIC 207: ADVANTAGES OF PANEL SURVEYS-IV

With panel data one may control for unobserved characteristics (heterogeneity).

This is an econometric issue of some importance. For instance, we know that some farmers are better managers than others, but we cannot identify which are good managers and which are not. Suppose that good managers use more fertilizers than bad managers. Then if we regress farm output on the amount of fertilizer inputs (and other variables), the estimated effect of fertilizer inputs will be overstated, because it is picking up both the true fertilizer effect, and the influence of the managerial skills with which it is correlated.

On the other hand, suppose we have panel data, and so observe farmers' outputs at two points in time. Then a regression of the change in output on the change in fertilizer input will (by and

large) give us an unbiased coefficient, because the unobserved factor (managerial expertise) will in effect drop out.

TOPIC 208: ADVANTAGES OF PANEL SURVEYS-V

Panel data are useful in evaluating the impact of government programs.

both because they mean we do not have to rely on retrospective reporting, but also because they allow us to avoid the effects illustrated below of endogenous program placement and selective migration. The implication is that it is helpful to have baseline survey data before undertaking a program, and then to revisit these households (or individuals) once the program has been put into place.

To illustrate, consider the following assignment. You have been asked to evaluate the impact of a government program that is designed to help sick children by providing additional funds to rural health clinics. You decide to undertake a survey of households, chosen randomly throughout the country. To your surprise, you find that the sickest children are those in villages that received subsidies. It appears that the government program is doing just the opposite of what it was designed to do.

TOPIC 209: DRAWBACKS OF PANEL SURVEYS-I

Over time, a panel of households (or individuals) becomes smaller and smaller, creating potential attrition bias. Some households dissolve, as their members die. Others migrate. Some may refuse to answer the second time around. This attrition is serious because it is generally nonrandom, and so the panel becomes less representative over time. The households that die are older; the migrants are probably more vigorous and more affluent; and those who refuse to answer are likely to be atypical in one way or another.

TOPIC 210: DRAWBACKS OF PANEL SURVEYS-II

Over time, a panel becomes less representative of the population at large. Even if there were no attrition, a panel would become, over time, less and less representative of the population it is supposed to reflect. This is, because the panel, by construction, does not add new households, and so newly formed households are excluded, and households that split up for instance, due to a divorce are imperfectly followed.

The VLSS of 1998 addressed this problem of representativeness by adding new households to the original panel, including recently formed households; the latter were then given a relatively high weight, to compensate for the fact that they were underrepresented in the panel part of the sample. The main justification for rotating panels is to ensure the continued representativeness of the survey.

TOPIC 211: DRAWBACKS OF PANEL SURVEYS-III

The construction of a viable panel requires considerable managerial capacity, and can be costly. The costs arise in tracking down migrant households, and possibly in the need for a longer initial questionnaire. Managerial skills are also needed to store the initial information reliably and to maintain the confidentiality of the data.

ISSUES IN CROSS SECTION, TRANSIENT POVERTY AND ITS TYPES

TOPIC 212: OTHER ISSUES IN PANEL AND REPEATED CROSS SECTIONAL DATA-I

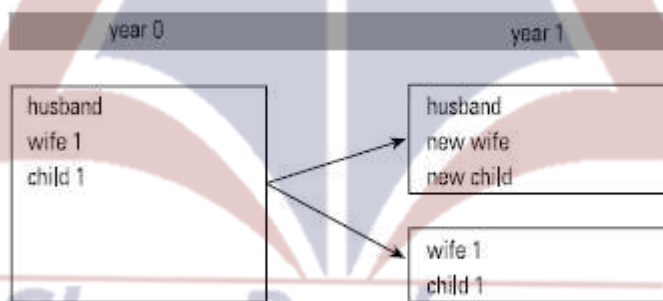
A number of other issues need to be borne in mind when comparing poverty rates over time, with or even without panel data.

Comparability in questionnaire. When the goal is to measure change over time, it is important to ensure that the questions are the same, and that the length of the recall period is also the same. This does leave an awkward problem: What is the researcher to do if the question asked in the first round was a bad one? The question could be improved, but only at the cost of less comparability over time.

Timing of fieldwork. Ideally, one would interview any given household at the same time of the year. This is because some variables, such as school enrollments, or farm cash income, vary seasonally. A farmer interviewed in August may remember the value of the recent harvest quite clearly; interviewed in March, the memory may have faded.

Defining the household. Consider figure 11.1. At the time of the first survey, a couple is living together with a child. Five years later, when the survey is repeated, the husband has divorced and remarried, and they have a new child; the former wife is now living alone with the original child. Which of the two new households is the true heir to the original one?

Figure 11.1 Defining the Household



Source: Authors' creation.

TOPIC 213: OTHER ISSUES IN PANEL AND REPEATED CROSS SECTIONAL DATA-II

Deflating. Over time, prices change. This means that monetary measures, such as income or expenditure, have to be deflated to make comparisons over time. This can be difficult, especially when prices change rapidly, as is likely in a crisis. The fundamental conclusions about what happened to poverty in Indonesia over 1997–99 hinge on which price deflator it is appropriate to use.

TOPIC 214: TRANSIENT POVERTY AND ITS TYPES

Some households are persistently poor, while others move in to and out of poverty from year to year (the “transient poor”). One of the most valuable applications of panel data is to identify who falls into each of these categories.

It is common to distinguish four categories of people:

- **Chronically poor** are those whose average consumption per capita over time ($\bar{c}$) is at or below the poverty line (z). Clearly one of the priorities in such cases is to help raise average consumption levels above the poverty line.
- **Persistently poor** are those, among the chronically poor, who never emerge from poverty, not even for a year or two. In this respect, they may be distinguished from those chronically poor who have an occasional good year when they escape from poverty for a while.
- **Transient poor** are those who are poor from time to time, but who are not poor on average. With better smoothing of their consumption stream they could, in principle, avoid all spells of poverty.
- **Never poor**, who do not even drop into poverty occasionally (at least in the time frame under study).

TOPIC 215: CHRONIC VS TRANSIENT POOR

These distinctions are important for a number of reasons.

- First, moving into and out of poverty looks less serious than remaining stuck in poverty. Someone who is poor now, but can reasonably expect to be out of poverty next year, is in a better position than someone who is equivalently poor now, and is likely to remain there in the future.
- Second, the policies needed to address the various types of poverty may differ. The transient poor are more likely to need short-term relief, through insurance or income stabilization schemes. On the other hand, the chronically poor are more likely to need more education, skills, and assets, and to become less isolated from the rest of the economy.

A corollary is that the existence of transient poverty makes poverty targeting harder, if we only have information at a single point in time. If I know you are poor, but I don't know if you are chronically or temporarily poor, I may deliver the wrong type of support. Or if the goal is to provide budget support only to the chronically poor, the presence of a large number of transient poor will undermine the effort at targeting.

TOPIC 216: ESTIMATES ON CHRONIC, PERSISTENT AND TRANSIENT POVERTY

Table 11.2 Chronic, Persistent, and Transient Poverty, China, 1985–90

	Chronically poor		Transient poor (and not chronically poor) $\bar{c} > z, c_t \leq z$	Never poor $c_t > z, \forall t$	Percentage of poverty (measured by P_2) that is transient
	Persistently poor $c_t \leq z, \forall t$	Not persistently poor $c \leq z, c_t > z$ for some t			
Total sample	6.2	14.4	33.4	46.0	49
Guangdong	0.4	1.0	18.3	80.3	84
Guangxi	7.1	16.1	37.4	39.4	49
Guizhou	11.9	21.2	40.2	26.7	43
Yunnan	4.9	18.0	35.6	41.5	57

Source: Jalan and Ravallion 1998.

Note: c_t is the consumption by a person in time t , z is the poverty line, and $\bar{c}$ is mean consumption of the person over the time period under study.

TOPIC 217: ESTIMATES ON CHRONIC, PERSISTENT AND TRANSIENT POVERTY IN PAKISTAN

Appendix Table 2

Distribution (%) of Households by Family Size in 1998-99 According to Change in Poverty Status between 1998-99, and 2000-01

Change in Poverty Status between 1998-99 and 2000-01	Family Size (Members)—1998-99				
	1-4	5-6	7-8	9 and More	All
Chronically Poor	7.3	18.8	31.1	42.8	100
Transitory Poor					
Moved out of Poverty	12.9	27.8	29.9	29.3	100
Moved into Poverty	24.9	26.0	27.9	21.2	100
Non-poor	33.5	31.4	18.8	16.2	100
All Households	23.7	27.3	24.4	24.6	100

Source: Computed from the two rounds of the PSES (1998-99 and 2000-01).

TOPIC 218: ANALYSIS OF PEOPLE IN TO AND OUT OF POVERTY OVER TIME; BY USING TRANSITION MATRIX

Another way to show the effects of the movement of people in to and out of poverty over time is by means of a transition matrix. This can be done in a number of ways.

Table 11.4 is based on panel data from Vietnam for 1993 and 1998, and shows how many households from any given quintile (defined by expenditure per capita) in 1993 are still in the same quintile in 1998, and how many have moved into each other quintile. The table, from Haughton et al. (2001), shows a high degree of mobility: of the 856 households in the middle quintile in 1993, only 234 were in the same quintile in 1998; 339 had moved up and 283 had moved down in the expenditure distribution. Haughton et al. (2001) refer to households that jumped at least two quintiles as *shooting stars* (the shaded cells in the northeast of table 11.4) and those that fell at least two quintiles as *sinking stones*. Households that were in one of the bottom three quintiles in 1993 and also in one of the bottom two quintiles in 1998 may be considered to be persistently poor and are shown in the block of shaded cells in the top left-hand corner of table 11.4. Other types of transition matrix are also possible.

Table 11.4 Quintile Transition Matrix for Households, 1993-98

	Number of households, by expenditure/capita quintile, 1998					Total
	Poor	Poor-middle	Middle	Mid-upper	Upper	
Quintile 1993						
Poor	384	216	127	54	9	790
Poor-mid	193	264	223	120	32	832
Middle	100	183	234	254	85	856
Mid-upper	38	127	217	301	205	888
Upper	12	35	100	209	550	906
Total	727	825	901	938	881	4,272

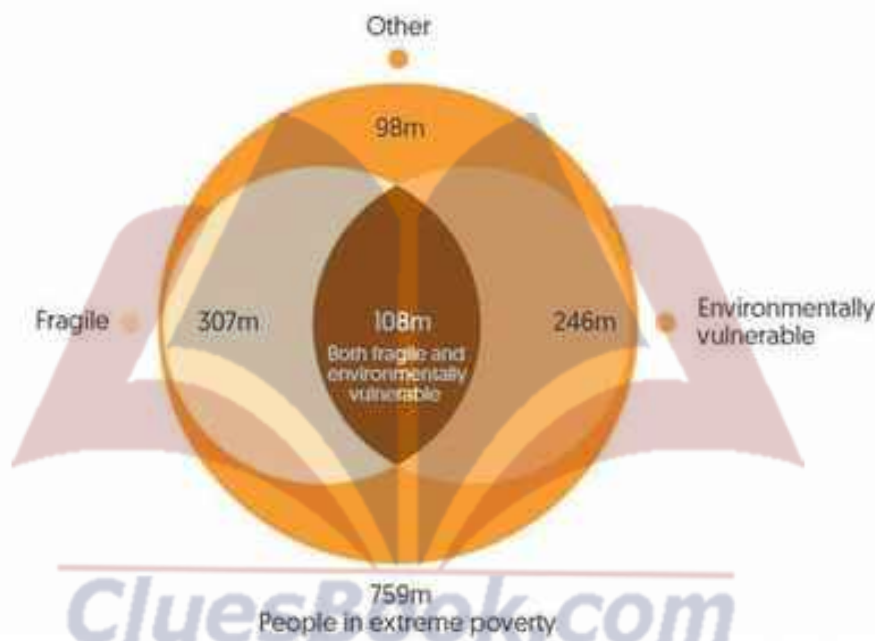
Sources: Vietnam Living Standards Surveys of 1993 and 1998.

CRISIS AND POVERTY**TOPIC 219: CRISIS AND POVERTY**

There has been increased recognition in recent years on the need to build collective humanitarian, development and peacebuilding outcomes to effectively tackle poverty, vulnerability and crisis. The Grand Bargain, which emerged out of the World Humanitarian Summit in 2016, includes a commitment to enhance engagement between humanitarian and development actors, and the Addis Ababa Action Agenda Third international conference on Financing for Development recognized the need to build coherence between Agenda 2030 and humanitarian responses.

To achieve collective outcomes, data is critical. Information on both the needs of people and the current allocation of resources is vital to spend resources effectively. So what does the data tell

Number of people living in extreme poverty in environmentally vulnerable and fragile countries



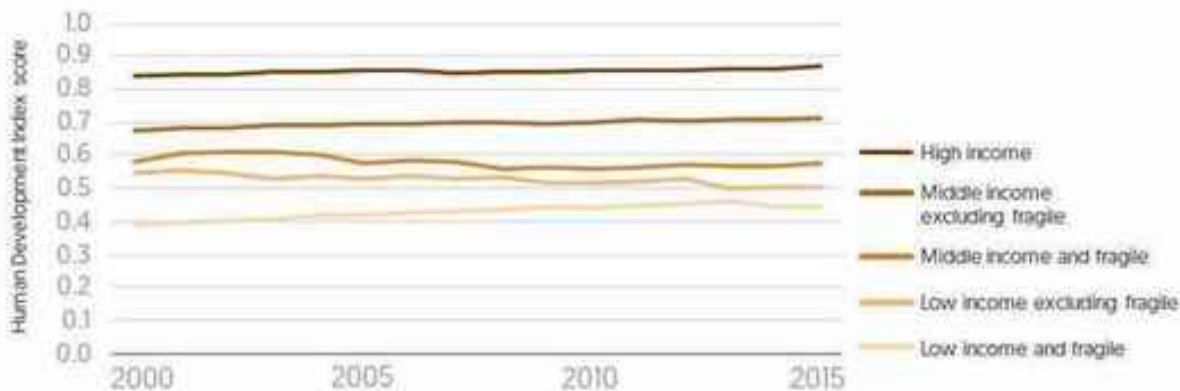
Source: Development Initiatives based on World Bank PovcalNet, World Bank World Development Indicators, OECD, INFORM Index for Risk Management.

Notes: Chart not to scale. Poverty estimates use World Bank PovcalNet modelled 2013 data. Regional estimates are used for 21 countries with no poverty data. Eight Middle East and North Africa countries are excluded due to lack of national or regional representative data. Fragile states defined according to 2016 OECD report on States of Fragility; and environmental vulnerability defined using INFORM's 2017 index, selecting countries scoring very high and high on 'natural hazard' indicator, and very high, high and medium on 'lack of coping capacity'.

us about the linkages between poverty, crisis and risk?

As illustrated in Figure 1, most people living in extreme poverty are in countries affected by fragility, environmental vulnerability or both (87%; 661 million people). Poverty is concentrated in high-risk settings, and the greatest increases in levels of extreme poverty in 2013 were experienced in protracted conflict and complex crisis contexts – in the Democratic Republic of the Congo and South Sudan.

Human Development Index scores of fragile countries by income level, 2000–2015



Source: Development Initiatives based on INFORM Index for Risk Management, OECD, World Bank and UN Development Programme data.
Notes: Average Human Development Index scores are based on country categorisation as fragile, environmentally vulnerable, both or neither, based on most recent data. See Figure 18 for more details on country categorisation. The categories are mutually exclusive. Middle income countries include both lower and upper income groups.

Furthermore, low-income fragile countries, including those in a number of crisis-affected contexts such as South Sudan, have fallen even further behind on the Human Development Index in recent years, as demonstrated in Figure 3.

This data shows that poverty, crisis and risk are intrinsically linked, and if we really are to see an end to poverty in all its forms everywhere, we must develop and invest in a holistic set of financing tools and sustained investment to address the causes and long-term consequences of crises. Continued efforts to strengthen data and address information gaps on levels of poverty and people's needs in crisis and risk contexts will also be critical. In many high-risk settings, true levels of poverty are simply unknown and national figures may miss pockets of subnational crisis.

TOPIC 220: CASE STUDY; ASIAN FINANCIAL CRISIS AND POVERTY IN INDONESIA

How much did the Asian financial crisis of 1997–98 reduce poverty in Indonesia?

The case study touches on many of the practical issues that emerge when using panel data. After the devaluation of the Thai baht in July 1997, investors and bankers began to change their perceptions of the economic prospects of other countries in Southeast and East Asia. Indonesia was hard hit, as capital flight and a sharp drop in foreign direct investment created an exchange rate crisis. The rupiah fell from Rp 2,400 per U.S. dollar prior to the crisis to Rp 4,800 per dollar by December 1997; it collapsed to Rp 15,000 per dollar in January 1998, recovering by the end of the year to just under Rp 7,000 per dollar.

As the rupiah fell, interest rates rose rapidly; many borrowers were unable to maintain loan payments, triggering a banking crisis. And the lack of credit meant that many businesses were starved of working capital and were forced to contract.

The problem was compounded by a severe drought, related to El Niño, which hit the country in 1997. Where gross domestic product (GDP) rose by 7 percent annually before the crisis, it fell by 13.2 percent in 1998 and rose by a mere 0.2 percent in 1999. The government responded by launching a Social Safety Net (SSN) program, which provided a rice price subsidy for the poor, more scholarships for children from poor families, a Health Card providing free basic health services for the poor, and a public works program.

TOPIC 221: CASE STUDY; ASIAN FINANCIAL CRISIS AND POVERTY IN INDONESIA, IMPACT ON POVERTY

How much did poverty rise following the onset of the crisis? One way to answer this is to focus on current consumption expenditure deficit (CCED) poverty, looking at the households whose current expenditure levels fall below some predefined poverty line. A fuller answer would consider other dimensions of poverty, a point to which we return below.

It is difficult even to compute “conventional” poverty rates for the periods before, during, and after the crisis. The problems are technical ones, mainly related to how to choose the appropriate price indexes during a period of rapid inflation, when food prices were rising particularly quickly.

Consider the poverty rates shown in table 11.5, reported in table 1 of Said and Widyanti (2001). All of these numbers are based on National Socio-Economic Surveys (Susenas), including full surveys in February 1996 and February 1999, and Mini-Susenassurveys in December 1998 and August 1999. The Susenasurveys sample around 200,000 households every February, and collect core data annually; three large modules, including one on expenditure and income, are used on a rotating basis. The Mini-Susenassurveys sampled about 10,000 households and were designed to collect data in a more timely manner than the full surveys.

Table 11.5 The Headcount Poverty Rate (P_h), S&W and BPS Methods
(based on expenditure)

	Urban (%)		Rural (%)		All Indonesia (%)	
	S&W	BPS	S&W	BPS	S&W	BPS
Feb 1996	12.1	13.6	17.8	19.9	15.7	17.7
Dec 1998	18.7	21.9	31.4	25.7	26.4	24.2
Feb 1999	18.9	19.4	25.4	26.0	22.9	23.4
Aug 1999	13.1	15.0	22.6	20.0	18.8	18.0

Sources: Said and Widyanti 2001; Suryahadi et al. 2000.

Note: S&W = Said and Widyanti approach; BPS = Indonesian Statistics Office (official) approach.

TOPIC 222: CASE STUDY; ASIAN FINANCIAL CRISIS AND POVERTY IN INDONESIA, IMPACT ON POVERTY MEASUREMENT METHODOLOGY

The Indonesian Statistics Office (BPS) figures use the official methodology for computing the poverty line, as revised substantially in 2000. The steps taken are as follows;

- Identify those households whose nominal expenditures fall in the second and third deciles (the “initial reference population”).
- Identify the “national bundle” of 52 commodities that represent the most important expenditures of these households, along with their share in total expenditure.
- Construct the price of this “national bundle” in each province, using data on unit costs from the initial reference population, and express these regional price deflators as a proportion of the price level in Jakarta.
- Deflate total expenditures using the provincial deflators, to arrive at “real expenditure.” Use the distribution of real expenditure to identify the “new reference population” whose spending is in the second and third deciles. Use the consumption pattern of this group to compute the amount of calories consumed and the cost of these calories.
- Scale up this cost of calories to determine the annual cost of 2,100 Calories per person per day. This is the food poverty line.

TOPIC 223: CASE STUDY; IMPACT OF FLOODS ON POVERTY IN PAKISTAN

Table 13.5: Pre-Flood Education Sector Indicators of Flood Affected Areas

Areas	PSLM 2004-05		PSLM 2008-09	
	Net Enrollment Rate* (NER) Primary Level			
	NER	GPI	NER	GPI
<i>Pakistan Overall</i>	52.4	0.85	57.4	0.88
<i>Severely Affected by Floods</i>	41.8	0.73	47.9	0.77
<i>Moderately Affected by Floods</i>	53.1	0.82	58.2	0.83
<i>Not Affected by Floods</i>	58.0	0.92	62.2	0.95
	Literacy for Ages 10 Years and Above			
	Literacy	GPI	Literacy	GPI
<i>Pakistan Overall</i>	52.8	0.62	57.3	0.65
<i>Severely Affected by Floods</i>	41.4	0.41	45.6	0.44
<i>Moderately Affected by Floods</i>	49.4	0.50	54.8	0.54
<i>Not Affected by Floods</i>	58.8	0.73	62.9	0.75
	Youth Literacy for Ages 15-24			
	Literacy	GPI	Literacy	GPI
<i>Pakistan Overall</i>	65.5	0.72	69.6	0.77
<i>Severely Affected by Floods</i>	51.5	0.48	55.9	0.54
<i>Moderately Affected by Floods</i>	62.4	0.60	67.3	0.66
<i>Not Affected by Floods</i>	72.3	0.85	75.9	0.88

Source: CPRSPD staff calculations from PSLM 2004-05 and 2008-09

Table-13.6: Pre-Flood Selected Social Sector Indicators of Flood Affected Areas

Areas	PSLM 2004-05		PSLM 2008-09	
	Immunization for children 12-23 months			
	Immunization	GPI	Immunization	GPI
<i>Pakistan Overall</i>	79.0	0.98	77.9	0.99
<i>Severely Affected by Floods</i>	74.4	0.95	69.6	0.99
<i>Moderately Affected by Floods</i>	77.6	1.00	74.7	1.01
<i>Not Affected by Floods</i>	81.8	0.99	82.9	0.98
Access to Drinking Water				
<i>Pakistan Overall</i>	87.9		88.3	
<i>Severely Affected by Floods</i>	83.4		84.6	
<i>Moderately Affected by Floods</i>	85.6		87.8	
<i>Not Affected by Floods</i>	90.6		89.9	
Access to Sanitation				
<i>Pakistan Overall</i>	59.2		70.9	
<i>Severely Affected by Floods</i>	46.2		57.5	
<i>Moderately Affected by Floods</i>	53.6		66.0	
<i>Not Affected by Floods</i>	66.4		77.7	

Source: CPRSPD staff calculations from PSLM 2004-05 and 2008-09

The floods of 2010 have long-lasting impact on socio-economic development of the country as nearly 20 million people were impacted by the damages to economic activity. The floods have caused a significant loss to poverty reduction efforts and would result in increase in poverty and vulnerability of affected population.

TOPIC 224: CASE STUDY; IMPACT OF FOOD INFLATION ON POVERTY IN PAKISTAN

Table-13.2: Impact of Domestic Food Price Increase on Poverty for Developing Asia

	Poverty before Price Increase	Poverty after Food Price Increase by		
		10%	20%	30%
Based on \$1.25-a-day poverty line				
Percentage of Poor (%)	27.1	29	30.9	32.9
Change in percentage of poor (percentage points)	903	1.9	3.9	5.8
Change in number of poor (in millions)		64.4	128.8	193.2
Poverty gap ratio (%)	6.79	8.15	9.51	10.86
Change in poverty gap ratio (percentage points)		1.4	2.7	4.1

Note: The estimates of poverty impact have been derived using the price elasticity of poverty, which indicates the percentage increase in poverty when food prices increase by 1%. This elasticity was estimated for both headcount ratio and poverty gap ratio for each of the 25 countries in Asia and the Pacific using the latest POVCAL database.

Source: ADB staff calculations based on the latest POVCAL database (accessed 18 February 2011).

Economic Survey 2010-11

Table-13.3: Impact of Food Price Increases on Poverty (\$1.25-a-day poverty line)

	Change in Percentage of Poor (in percentage points)			Change in Number of Poor (in millions)		
	with an Increase in Food Prices by			with an Increase in Food Prices by		
	10%	20%	30%	10%	20%	30%
Bangladesh	2.5	5.0	7.5	3.83	7.65	11.48
India Rural	2.9	5.8	8.8	22.82	45.64	69.45
India Urban	2.1	4.3	6.4	6.68	13.36	20.04
Pakistan	2.2	4.5	6.7	3.47	6.94	10.41
Bhutan	1.8	3.5	5.3	0.01	0.02	0.03
Philippines	1.6	3.2	4.9	1.37	2.75	4.12
Sri Lanka	1.2	2.4	3.6	0.24	0.47	0.71
Thailand	0.1	0.2	0.2	0.05	0.10	0.15
Viet Nam	1.9	3.7	5.6	1.55	3.10	4.65

Source: ADB staff calculations using the latest POVCAL database (accessed 18 February 2011).

TOPIC 225: THE PROBLEM OF DEFLATION: POVERTY RATES OVER TIME

To compare poverty rates over time, it is necessary to deflate the poverty lines to account for inflation. If prices rise modestly, and especially if all prices rise at about the same rate, then deflating poverty lines is relatively straightforward and the results are typically satisfactory. In the Indonesian case, however, the price of food in the consumer price index (CPI) rose by 160 percent between February 1996 and February 1999, while the rise in the price of the nonfood components of the CPI was just 81 percent. Not only was there high overall inflation, but also a massive change in relative prices over this period. The relative increase in the price of food was due in large measure to the substantial real devaluation of the rupiah, making food imports (and hence food in general) relatively more expensive.

One could use the CPI to deflate the February 1999 poverty lines to get poverty lines in the prices of February 1996. But this would not be satisfactory, because food makes up just 40 percent of the CPI basket; it therefore understates the inflation faced by poor households, who devote far more than 40 percent of their expenditures to food. Suryahadi et al. (2000) experiment with three different methods of deflating. Given prices of food and non-food.

- Deflate each household's consumption using their actual share of food in consumption expenditures.
- Deflate each household's consumption using the share of food in the poverty basket.
- Deflate the food poverty line using the food price index and compute the nonfood allowance using the Engel curve methodology.

Table 11.8 Poverty Rates Computed Using Different Food Shares and Prices, February 1996 and February 1999

	Base case 1996	1999 using CPI	1999 using unit values
Working forward: start with poverty rate in February 1996			
Method 1: actual share of food in consumption, at poverty line	9.8	15.3	16.9
Method 2: share of food in the poverty basket	9.8	16.3	17.9
Method 3: deflate to get poverty line + recomputed nonfood share	9.8	20.3	22.4



VULNERABILITY AND POVERTY

TOPIC 226: WHO IS VULNERABLE?

The solution is to identify those who are vulnerable to poverty—that is, who have a significant probability of being poor next year. People are highly vulnerable if they have more than an even chance of being poor in the next period and moderately vulnerable if they are more likely than the typical person to be poor next year.

Vulnerability can only be quantified by making some simplifying assumptions. With an estimation of expected consumption per capita ($E(ct+1)$), its variance (σ^2), and the poverty line (z), and assuming that consumption per capita (or its log) is normally distributed, it is straightforward to estimate the probability that a household will be poor (v_{ht}) and so to determine whether the household may be considered to be vulnerable or not. Vulnerability to poverty is due to either low expected consumption or high variability in consumption. A measure of $E(ct+1)$ is typically found by estimating a regression model of ct and using it to predict $ct+1$. The variance is best estimated using longitudinal or panel data; however, because such data are rare, variance is often inferred from cross-sectional variation instead. Unfortunately, this misses the effects of unusual economy wide shocks such as the Asian financial crisis of 1997. Studies of vulnerability typically find that the proportion of people who are vulnerable to poverty substantially exceeds the proportion who are currently poor. One implication is that this makes targeting more difficult.

TOPIC 227: WHY MEASURE VULNERABILITY?

The study of poverty focuses on those who are currently poor (or were poor in the past). This is because poverty can be measured only ex post. Such an approach has its merits: for instance, by using actual data one may measure the effects of past public interventions on the extent of poverty; and it allows us to identify whose poverty needs to be alleviated.

But governments and policy makers are typically more interested in the effects that their measures will have in the future. For this it would be valuable to be able to identify those who are expected to be poor ex ante (that is, in the future). Such households are considered to be vulnerable to poverty. As Chaudhuri, Jalan, and Suryahadi (2002, 2) put it, “for thinking about appropriate forward-looking antipoverty interventions (that aim to prevent or reduce future poverty), the crucial need then is an assessment of households’ vulnerability to poverty.”

A household is vulnerable to poverty if it is likely to be poor in the future. Dercon (2001, 1) defines vulnerability as “ex ante poverty.” Since vulnerability is a forward-looking concept, it measures “exposure to poverty rather than the poverty outcome itself” (Dercon 2001, 27).

TOPIC 228: TRENDS IN VULNERABILITY TO POVERTY

Table 12.2 Changes in Poverty from Panel Surveys in Selected Countries

Country	Period	Headcount (%)		
		Always poor	Sometimes poor	Never poor
Zimbabwe	1992/93–1995/96	11	60	30
Pakistan	1986–91	3	55	42
South Africa	1993–98	23	32	46
Russian Federation	1992–93	13	30	57
Ethiopia	1994–97	25	30	45
Côte d'Ivoire	1987–88	25	22	53

Source: Pritchett, Shryahadi, and Sumarto 2000, based on Baulch and Hoddinott (2000).

Note: The definitions of poverty line vary from country to country, so the poverty rates are not comparable across countries. Totals may not add to 100 due to rounding.

TOPIC 229: VULNERABILITY TO POVERTY; WELFARE SHOCK

First, what is meant by a “welfare shock”?

The measure of welfare most commonly used by economists in this context is consumption per capita (or per adult equivalent), although other measures such as income could be used instead. In their study of vulnerability in Mali, Christiaensen and Boisvert (2000) use a measure of malnutrition as their indicator of welfare.

So a welfare “shock” is commonly measured as a change in consumption per capita. The shock could be negative or positive, although we typically are concerned with shocks in the more traditional sense of harmful events. By focusing on consumption rather than income or assets, we are implicitly allowing for household coping mechanisms to operate.

For instance, consider a village that is hit by drought every few years. Households, anticipating periods of drought, store grain in good years to tide them over the bad years. If we use income as our measure of welfare, we would overstate household well-being in good years and understate it in drought years; by using consumption as the indicator of welfare, we are allowing for household response.

TOPIC 230: VULNERABILITY TO POVERTY; SOCIALLY DEFINED MINIMUM LEVEL

What “socially defined minimum level” of welfare is appropriate?

Here, we typically use a poverty line, where we discuss how best to pick a suitable poverty line. Studies of vulnerability to poverty generally use an absolute poverty line

TOPIC 231: VULNERABILITY TO POVERTY; INTENSITY/DEPTH

How might one measure the “propensity to suffer a significant ... shock” of being poor?

A good practical way to measure vulnerability is as the probability of being poor

- In the next year (Chaudhuri, Jalan, and Suryahadi 2002), or
- At some point over the next few years (Pritchett, Shryahadi, and Sumarto 2000).

But how high does this probability of being poor need to be for us to consider the person (or household) as being vulnerable? If I have a 1 percent probability of being poor next year, am I vulnerable? Or 10 percent? Or 50 percent?

TOPIC 232: THRESHOLD LEVEL OF VULNERABILITY

The choice of line separating those who are vulnerable to poverty from those who are not is arbitrary, but researchers typically use one of two thresholds:

- A probability of being poor of 50 percent. In this case, a household has at least an even chance of being poor next year. Such households are sometimes referred to as “highly vulnerable.”
- A probability of being poor of P_0 (where P_0 is the headcount poverty rate). It can be shown that under plausible assumptions the average vulnerability to poverty that is, the average probability of being poor is equal to the headcount poverty rate. If your probability of being poor is higher than this.

For example, 20 percent, when the poverty rate is 12 percent then you might be considered vulnerable by this measure. In effect, this means that you are more likely than the typical household to be poor in the next period. Households whose probability of being poor is higher than P_0 but lower than 50 percent are sometimes put into the category of “low vulnerability.”



MEASUREMENT OF VULNERABILITY

TOPIC 233: QUANTIFYING VULNERABILITY AT HOUSEHOLD LEVEL

At first sight, the task of measuring vulnerability to poverty seems daunting. In principle, we would need to know the following information for every household:

- What resources they can draw on in the next year, including assets such as land as well as their educational endowments and their skills and experience
- What risks they face such as drought, higher prices for food, family illness, and so on; the probability of each set of risks ("states of the world"); and the effect of each set of risks on their resources
- Their ability to handle each set of risks for instance, by eating into stocks of corn, or drawing on family support networks, or borrowing money, or working harder.

It is clearly impossible to collect all the information needed for such an analysis, and it may be equally hard to model all the possible behavioral responses by households.

The solution, as in all modeling, is to simplify enough to make the problem tractable. In the simplest case, three pieces of information and one additional assumption are enough to allow us to measure a household's vulnerability to poverty. The required pieces of information are as follows:

- The household's expected level of consumption per capita in the next period, given by $E(c_{t+1})$
- The variance of the household's expected level of consumption per capita in the next period, σ^2
- The poverty line, z .

To this we add the assumption that the expected level of consumption follows a known distribution such as the normal (Gaussian) distribution.

TOPIC 234: MEASURING EXPECTED CONSUMPTION AND ITS VARIANCE

Although we do not know what a household's level of consumption will be next year, it may be possible to arrive at a reasonable estimate by first building a model of the determinants of consumption and then using the model to predict next year's consumption. Formally, we have

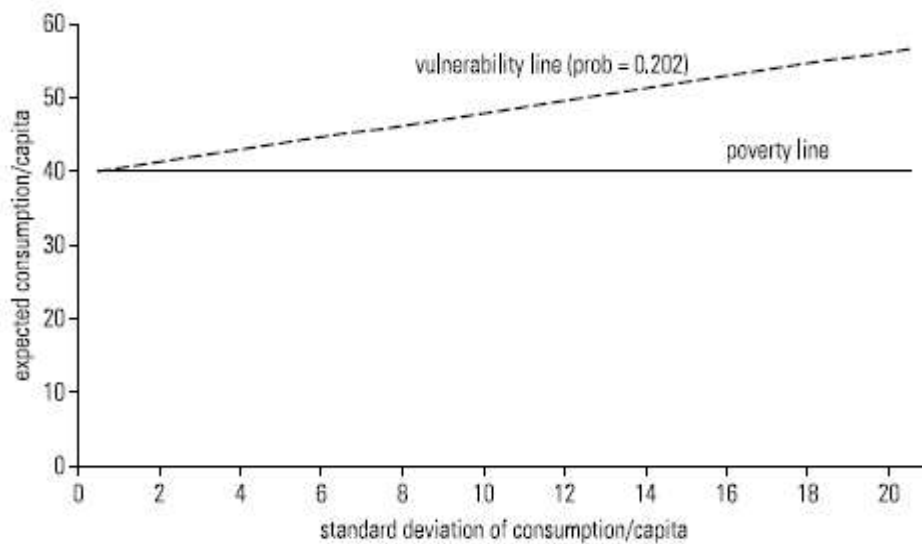
$$C_{h,t} = C(X_h, \beta_t, \alpha_h, e_{ht})$$

Where,

- X_h is a vector of observable household characteristics such as the age and education level of the household head, the number of household members, and so on.
- β_t is a set of economy-wide parameters that pick up the effects of nationwide shocks, such as a financial crisis or a political revolution.
- α_h captures any unobserved time-invariant household effects, such as the abilities of household members, for instance.
- e_{ht} is an error term that measures "idiosyncratic" factors, meaning the sort of shocks that might buffet one household but not another. The variance of this error could vary substantially from one household to the next.

If we could estimate this relationship, including the variance of expected consumption, then we could measure vulnerability as:

$$v_{h,t} = \Pr(c_{h,t+1} = c(X_h, \beta_{t+1}, \alpha_h, e_{h,t+1}) < z \mid X_h, \beta_t, \alpha_h, e_{ht}).$$

Figure 12.2 Identifying Vulnerable Households

Source: Based on authors' calculations.

TOPIC 235: METHODOLOGICAL ISSUES IN MEASURING VULNERABILITY

The measurement of vulnerability to poverty is inherently more problematic than the measurement of poverty itself, because of the challenges involved in arriving at adequate predictions of the future. The approach outlined above draws on that followed by Chaudhuri, Jalan, and Suryahadi (2002) but can, or perhaps should, be refined in a number of ways. These refinements may sound technical, but they are important:

Measurement Error. It is generally accepted that there is substantial error in the measurement of consumption. A consequence of this measurement error is that we are almost certainly overstating the extent to which households move into and out of poverty. It also implies that the estimates of the variance of the idiosyncratic shocks that affect households (that is, the estimate of σ^2) are overstated. Pritchett, Shryahadi, and Sumarto (2000) argue that between a third and half of the variance is due to measurement error, and in their work they adjust it downward by 30 percent.

Measurement of Variance. Chaudhuri, Jalan, and Suryahadi (2002) measured the variance of future consumption by looking at the structure of errors in the consumption equation. However, this equation was estimated with cross-section data, which allows us to measure variation across space but not over time. Ideally we would like to measure the variation of a household's income over time. In principle, this requires data from longitudinal studies, which follow individuals (or households) over an extended period of time; in practice, such data are almost nonexistent in less developed countries, and even if they were, one would have to assume that there was no change in economic structure, so that the historic record of consumption variability is an adequate guide to its future variability.

The Normality Assumption. It is typically assumed that the log of consumption is normally distributed. However, this may not be the case, and some authors (Kamanou and Morduch 2002; Köhl 2003) have based their estimates of vulnerability to poverty on the actually observed distribution of the errors of the consumption equation, using bootstrapping.

Estimation Procedures. For the purposes of this chapter, we have assumed that regression estimates can be based on using ordinary least squares (OLS). It turns out that this may not be consistent, and more elaborate procedures may be called for; for an example, see the use of Amemiya's three-step feasible generalized least squares estimator by Chaudhuri, Jalan, and Suryahadi (2002).

TOPIC 236: SOURCES OF VULNERABILITY

The attempt to understand the causes of vulnerability to poverty is not futile.

Dercon (2001) proposes a framework for analysis that is helpful in this context, and is reproduced here (in modified form). The basic idea is that households have assets, such as land, labor, and physical, human, and social capital. They deploy these assets to generate income. And the income in turn is used to generate wellbeing, mainly through consumption.

At each point in the process there are risks. Assets may be degraded if there is war, or uncertain land tenure, or a theft. Income may be reduced if there is a drought or output prices fall. The ability to consume may be reduced if the cost of food rises or food is rationed.

An implication of this analysis is that policies to reduce vulnerability to poverty need to operate in two ways: first, they need to try to raise the average level of well-being, much as any antipoverty program would try to do. And, second, they need to focus on reducing risk and its consequences, essentially through insurance mechanisms.

TOPIC 237: FRAMEWORK FOR ANALYZING VULNERABILITY TO POVERTY

Table 12.4 A Framework for Analyzing Vulnerability to Poverty

Assets	Incomes	Well-being/capabilities
• Human capital, labor • Physical/financial capital • Common and public goods • Social capital	• Returns to activities and assets • Returns from asset disposal • Savings, credit, investment • Transfers and remittances	• Ability to obtain • Consumption • Nutrition • Health • Education
Examples of risk (a)	Examples of risk (b)	Examples of risk (c)
• Loss of skills due to ill health or unemployment • Land tenure insecurity • Asset damage due to climate, war, disaster • Uncertain access to common and public goods • Loss of value of financial assets	• Output falls due to climatic shocks, disease, conflict • Output prices rise • Reduced returns on financial assets • Uncertain cash flow during production • Weak contract enforcement, wages not paid • Imperfect information about opportunities	• Price risk in food markets • Food availability/rationing • Uncertain quality of public provision in health and education • Imperfect information on how to achieve good health, nutrition

Source: Based on Dercon (2001, 17).

TOPIC 238: MECHANISMS FOR MANAGING RISK

Table 12.5 Mechanisms for Managing Risk

	Informal Mechanisms		Formal Mechanisms	
	Individual and household	Group-based	Market-based	Publicly provided
Reducing risk	- preventive health practices - migration - more secure income sources	- collective action for infrastructure, dikes, terraces - common property resource management		- sound macroeconomic policies - environmental policy - education and training policy - public health policy - infrastructure - labor market policies
Mitigating risk Diversification	- crops and plots - income source - investment in physical and human capital	- occupational associations - rotating credit associations	- savings accounts in financial institutions - microfinance	- agricultural extension - liberalized trade - protection of property rights
Insurance	- marriage and extended family - sharecropping - buffer stocks	investment in social capital	- old age annuities - accident, disability and other insurance	- pension systems - mandatory insurance for unemployment, illness, disability
Coping with shocks	- sale of assets - borrowing from moneylenders - child labor - reduced food consumption - seasonal/temporary migration	transfers from mutual support networks	- sale of financial assets - loans from financial institutions	- social assistance - workfare - subsidies - social funds - cash transfers

Source: World Bank 2000, 141 (slightly modified).

TOPIC 239: SOME LESSONS ON VULNERABILITY TO POVERTY

A number of clear findings emerge from the literature on vulnerability to poverty.

- The first is that vulnerability to poverty is measurable, albeit imperfectly. It is also harder to measure than is poverty. But if the intention is to design measures to prevent poverty in the future, as opposed to alleviating the suffering of the current poor, then there is no escaping the need to measure vulnerability.
- As typically defined, vulnerability to poverty is more widespread than poverty itself. A wide swathe of society risks poverty at some point of time; put another way, in most societies, only a relatively modest portion of society may be considered as economically secure.
- Although the poor are likely to be vulnerable, a focus on poverty can be misleading and lead one to overlook the economic precariousness of many households. Pritchett, Shryahadi, and Sumarto (2000), using the “mini-Susenas” data for Indonesia for 1998–99, find that while urban poverty is just 8 percent, fully 30 percent of urban residents are vulnerable to poverty. This suggests that it is important not to overlook urban areas when trying to tackle poverty in the future.
- Part of the solution to vulnerability is the traditional one of antipoverty measures: raise consumption. But the other part focuses on social protection. Just as the measurement of poverty is justified in part by the need to keep poverty reduction on the agenda, the measurement of vulnerability is justified in part by the need not to forget the importance of social protection.

Some groups in society may be vulnerable in other ways than to poverty for example, children may be vulnerable to sexual abuse or forced labor.

POVERTY MONITORING AND EVALUATION

TOPIC 240: POVERTY MONITORING AND EVALUATION

A poverty monitoring and evaluation system is required to determine whether a country's overall poverty reduction strategy and its main components, are effective.

- The first step in poverty monitoring is to define the goals of the strategy. Operationally, this requires the identification of measurable indicators and the establishment of realistic targets that can help policy makers set priorities.
- Final indicators measure the outcomes of poverty reduction policies and the impact on dimensions of well-being. Intermediate indicators measure the inputs into a program and the outputs of the program.
- A good indicator is unambiguous, relevant, reliable, and sensitive to changes, and may be tracked cheaply and frequently.
- It can also be disaggregated, for instance by geographic area or gender.
- Impact evaluation seeks to measure the changes in well-being that can be attributed to a particular project or policy (an "intervention"); the results can help inform decisions about whether the intervention should be expanded or eliminated. The central challenge of impact assessment is constructing a plausible counterfactual.
- Several evaluation designs are used in impact evaluation, depending in part on the data that are available.
- Among the most important are experimental design (randomization); and quasi-experimental designs, including matching comparisons (typically using propensity scores), double differences, instrumental variables ("statistical control"), and reflexive comparisons.

Both experimental and quasi-experimental methods try to tackle the problem of sample bias that bedevils impact analysis.

TOPIC 241: HOW TO CONDUCT MONITORING AND EVALUATION FOR POVERTY PROJECTS?

Two questions naturally arise:

- Is the overall strategy effective?
- How large is the impact of each of the main components of the strategy?

The answers to these questions require monitoring and evaluation. A poverty monitoring system tracks key indicators of poverty over time and space. The resulting data can then be used to evaluate the program. Process evaluation examines how the programs operate, and focuses on problems of service delivery. Cost-benefit analysis and cost-effectiveness analysis weigh program costs against the benefits they deliver. They in turn require thorough impact evaluations, which quantify the effects of programs on individuals and households.

TOPIC 242: POVERTY MONITORING PROGRESS

The first challenge in monitoring progress toward poverty reduction is to:

- Identify the goals that the strategy is designed to achieve, such as "eradicate hunger" or "halve poverty within a decade."
- Select the key indicators that measure progress toward the goals, such as the proportion of individuals consuming less than 2,100 Calories per day, or the proportion of households living on less than a dollar a day.

- Set targets, which quantify the level of the indicators that are to be achieved by a given date for instance, halve the number of households living on less than a dollar a day by the year 2015.

TOPIC 243 AND 244: MDG'S; GOALS, TARGETS AND INDICATORS-I & II

Table 13.1 Millennium Development Goals, Indicators, and Targets

Goals and targets		Indicators
Goal 1: Eradicate extreme poverty and hunger		
Target 1	Halve, between 1990 and 2015, the proportion of people whose income is less than \$1 a day	1. Proportion of population below \$1 a day 2. Poverty gap ratio (incidence x depth of poverty) 3. Share of poorest quintile in national consumption
Target 2	Halve, between 1990 and 2015, the proportion of people who suffer from hunger	4. Prevalence of underweight children (under 5 years of age) 5. Proportion of population below minimum level of dietary energy consumption
Goal 2: Achieve universal primary education		
Target 3	Ensure that, by 2015, children everywhere, boys and girls, will be able to complete a full course of primary schooling	6. Net enrollment ratio in primary education 7. Proportion of pupils starting grade 1 who reach grade 5 8. Literacy rate for 15-to 24- year-olds

TOPIC 245: SELECTION OF INDICATORS FOR POVERTY MONITORING

It is helpful to classify indicators into two groups:

- Final indicators measure the outcomes of poverty reduction policies (for example, increased school attendance rates) and the impact on dimensions of well-being (for example, higher literacy rates).
- Intermediate indicators measure the inputs into a program (for example, spending on health care) and the outputs of the program (for example, clinics built, doctors hired).

TOPIC 246: QUALITIES OF A GOOD INDICATOR FOR POVERTY MONITORING

A good indicator has several qualities, including the following:

- It is a direct unambiguous measure of progress and is easy to understand.
- It is relevant to the objectives, which in the current context concern poverty reduction.
- It varies across areas, groups, and time.
- It is sensitive to changes in policies, programs, and "shocks."
- It is reliable and hard to manipulate.
- It can be tracked frequently and cheaply.

POVERTY EVALUATION PROCESS

TOPIC 247: SETTING THE TARGETS FOR POVERTY REDUCTION

There are two reasons to set concrete targets for poverty reduction:

- It forces decision makers to clarify their priorities and adjust the allocation of resources in consequence.
- It strengthens accountability.

The standard advice is to set a small number of targets in clear and unambiguous terms. The targets need to be consistent with other national goals, and to be achievable, given the country's overall level of economic development and its implementation capacity. They also need to be realistic about the resources that will be available.

TOPIC 248: EVALUATION OF MICRO PROJECTS FOR POVERTY REDUCTION

Suppose that a nongovernmental organization or government sets up a microcredit project or builds an irrigation canal.

- Forecast the impact of projects such as these on poverty reduction or other development objectives?
- Find out if the policy or program is cost-effective?
- Improve the design of programs and interventions?

To answer these questions an *impact evaluation* is required. Generally, an impact evaluation seeks to measure the changes in well-being that can be attributed to a particular project or policy (an "intervention").

The results of an impact evaluation can show which interventions have been effective, and thus inform decisions on whether they should be eliminated, modified, or expanded, as well as what priority they should be accorded.

Impact evaluations are expensive and can be technically complex. It thus makes sense to undertake one only if the policy or program is of strategic importance, or is innovative, and the information from the evaluation is likely to fill gaps in current knowledge.

It is also important to master the institutional details of the program or project that is being analyzed before proceeding with the statistical analysis. And the validity of the quantitative part of the evaluation is only as good as the quality of the data that can be brought to bear on the issue.

TOPIC 249: CHALLENGES IN POVERTY EVALUATION PROCESS

With our evaluation of what would have happened in the absence of the intervention (the counterfactual). The central challenge of impact assessment is constructing a plausible counterfactual.

The challenge is a difficult one. Consider the case of a program that provides additional food for example, maize or milk powder to poor mothers with infants.

Now suppose that the data show that the mothers and infants covered by the program are less well-nourished than those who are not covered. Are we to conclude that the project is a failure?

Perhaps; but then again, it is likely that the project targeted poor mothers with malnourished infants, so it is not surprising that households with underweight children are getting additional food. The problem here is one of estimating how malnourished the mothers and infants covered by the program would have been in the absence of the program, in other words, establishing an appropriate counterfactual. A number of methods ("evaluation designs") have been developed to address questions of this sort, and we now examine these one by one.

TOPIC 250: EXPERIMENTAL DESIGN

Widely regarded as the best approach to measuring the impact of an intervention, the idea behind experimental design, also known as randomization, is as follows:

- Before the intervention begins, identify those who are eligible to benefit from it.
- Then randomly select those who will benefit (the treatment group) and deny the benefit to the others (who will serve as the control group).
- After the intervention, measure the appropriate outcome variables (for example, degree of malnutrition, poverty gaps).

The difference in the mean values of the outcome variables between the control and treatment groups can be attributed to the effects of the intervention, give or take some sampling error.

TOPIC 251: QUASI-EXPERIMENTAL METHODS FOR POVERTY EVALUATION

If households are not assigned randomly to an intervention such as food stamps, vaccinations, or irrigation water then those who benefit are unlikely to be typical of the eligible population. There are two reasons for this.

- First, there may be nonrandom program placement, of which the researcher may or may not be aware; for instance, an antipoverty program may be more likely to be set up in poor villages. This is the problem of unobserved area heterogeneity.
- Second, there may be self-selection into program participation; for instance, more dynamic individuals may be the first to sign up, or program benefits may flow to those who are politically well connected, or sick people may move to villages that have been equipped with clinics.
- Such effects are often hard to detect, and give rise to the problem of unobserved individual and household heterogeneity.
- The presence of these unobservable immediately creates the problem of selection bias.
- The basic idea behind quasi-experimental designs is to construct statistical models of selection matching, double differences, instrumental variables, reflexive comparisons that permit one to compare program participants and nonparticipant (the comparison group) holding the selection processes constant.

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TOPIC 252: CASE STUDY; MICROFINANCE AND THE POOR IN BANGLADESH

Box 13.2 Case Study: Microfinance and the Poor in Bangladesh

Microfinance, or the provision of small loans to the poor, is often touted as an important tool for reducing poverty. A widely admired model is the Grameen Bank in Bangladesh, brainchild of Mohammed Yunus, which provides small loans to poor people, mainly women. The Bank also runs related education programs. The Bangladesh Rural Advancement Committee and the Bangladesh Rural Development Board run similar operations.

Does microfinance work? More specifically, does it alleviate poverty? Benefit women? Is it cost-effective? Sustainable?

These questions have been addressed using information collected in three postharvest surveys undertaken in Bangladesh in 1991 and 1992, covering 1,798 households in 87 villages. The villages were chosen from 24 subdistricts where microcredit programs had been implemented for at least three years before the survey and from five subdistricts where they had not been implemented. The programs target households who own less than half an acre of land, but not all of the targeted households borrow.

One may divide up the surveyed households as shown here:

Surveyed Households

	Villages with a program in place	Villages without a program
Nontarget households (own more than half an acre of land)	A	B
Target/eligible households that		
Do not or cannot participate	C	E
Participate	D	

One possibility would be to compare the impact of the program for households D with that of households C. The results are shown in the box table below:

Mean of Individual and Household Outcomes by Program Participation

Outcome	Program households (D)	Eligible nonprogram households (C)	Noneligible households (A B E)	All households
Boys' school enrollment rate (age 5-25)	45.4	33.3	52.8	43.9
Girls' school enrollment rate (age 5-25)	43.7	35.8	49.2	41.5

Box 13.2 continued

Outcome	Program households (D)	Eligible nonprogram households (C)	Noneligible households (A U B U E)	All households
Current contraceptive use rate (currently married women, 14–50)	41.9	35.9	35.6	36.9
Household weekly per capita consumption (taka)	86.4	78.2	124.8	95.7

Source: Khandker 2000.

The problem with this comparison is that there is likely to be selection bias; it appears, for instance, that those who are eligible for microfinance but do not participate say that they are concerned about their ability to repay, suggesting that they are more risk averse, or perhaps less motivated, than borrowers. If landowning is exogenous, then one could compare the outcomes of households C and D on the one hand with households E on the other. This assumes, however, that program and nonprogram villages are the same. An even better approach would be to use a double difference, by comparing $Y_{C,D} - Y_A$ with $Y_E - Y_A$, where Y is the impact of interest (consumption or income per capita, school enrollment rates, and the like).

Morduch (1998) used a similar approach and found that the microfinance programs appeared to improve the outcomes of interest. However, on further examination, he found that the programs were seriously mistargeted, with 20–30 percent of the borrowers owning more than the half-acre maximum. When these borrowers were excluded, the microfinance programs had essentially no discernible effects, except perhaps for lowering the variance of consumption and income for participants. On the other hand, it is possible that the comparison households may not have lacked access to microfinance, in which case Morduch's conclusion would be unsurprising. A serious problem with Morduch's simple difference-in-difference analysis is that program participation is exogenous or randomly given.

Because of sample selection bias that is inherently present with such nonrandom distribution of borrowers and nonborrowers, Pitt and Khandker (1998) used an instrumental variable method to estimate the program effect. The instrument is based on the exogenous land-based eligibility conditions. They found that program participation matters a lot when sample selection bias is corrected. However, the results are sensitive to the assumption of the land-based exogenous eligibility condition.

A follow-up panel survey was undertaken in 1998–99 to measure the effects of microfinance. Khandker (2005) estimated a number of regressions, using both instrumental variables and fixed effects (at the level of villages and households). A selection of results for

Box 13.2 continued

female participants is shown in the box table below, each row represents a different dependent variable, and each column a different estimation technique. Although the magnitudes of the impacts vary with the technique used, the overall results are more positive for borrowing by women than for men. That is, impacts are sensitive to controlling for household-specific unobservables.

Based on these and other findings, Khandker (2005) concludes that microcredit can reduce poverty in a cost-effective way, and benefits do flow to women. While a subsidy is required to develop the initial institutions, this subsidy dependence can be reduced over time (Khandker 1998).

Khandker also found that the ultrapoor do not join microcredit programs. A similar conclusion was reached by Patten and Rosengard (1991) in their evaluation of the microlending activities of Bank Rakyat Indonesia (BRI) in the 1980s; however BRI, unlike the Grameen Bank, did not require a subsidy for its microcredit.

Impact of Women's Borrowing from Grameen Bank on Individual and Household Outcomes

Outcome	Naïve model	Instrumental variables (IV) method	Village-level fixed effects & IV method ^c	Household-level fixed-effects model
Boys' school enrollment rate (age 5-25)	0.062 ^a (4.461)	0.131 (4.022)	0.103 (2.364)	0.013 (2.587)
Girls' school enrollment rate (age 5-25)	0.019 ^a (1.412)	0.085 (2.289)	0.013 (0.334)	0.016 (3.405)
Current contraceptive use rate (currently married women, age 14-50)	0.026 ^a (1.942)	0.095 (2.560)	-0.091 (-2.011)	-0.001 (-0.260)
Household weekly per capita consumption (taka)	0.004 ^a (1.765)	0.037 (2.174)	0.043 (4.249)	0.010 (2.697)

Source: Khandker 2000.

Note: Figures in parentheses are t-statistics. Household-level fixed effects estimates are preliminary.

a. probit

b. OLS

c. Results in column 3 are considered to be the best.

QUALITATIVE METHODS FOR EVALUATION OF POVERTY PROJECTS

TOPIC 253: QUALITATIVE METHODS FOR EVALUATION OF MACRO PROJECTS

Some evaluations rely largely on qualitative information, from focus groups, unstructured interviews, survey data on perceptions, and a variety of other sources.

Such information complements, but does not supplant, the more quantitative impact evaluations, because qualitative methods are based on subjective evaluations, do not generate a control or comparison group, and lack statistical robustness.

TOPIC 254: TIME SERIES DATA ANALYSIS

A time series is a set of data on a variable over time (for example, gross domestic product [GDP] for each of the past 20 years). One could compare the situation of households, using survey data, before and after the shock (that is, in time $t-1$ and time t). This is frequently done, but is quite imperfect because, as in reflexive comparisons, it does not establish an appropriate counterfactual. It implicitly assumes that if there had been no shock, the level of the variables in time $t-1$ would have persisted into time t .

Time-Series Data Analysis: Deviations from Trend

An improvement over the simple before-and-after comparison is to begin by constructing a counterfactual, usually by predicting what would have happened in the absence of the crisis by projecting past trends into the future. The impact of the crisis is then calculated as the difference between the actual outcome after the crisis, and the predicted one based on the past trend. This is the approach taken by Kakwani (2000) in estimating the effects of the Asian financial crisis of 1997 on poverty and other indicators in Korea and Thailand.

The first difficulty with this method is arriving at a robust counterfactual; for instance, how far back in time should one go when developing an equation that is used for the projections. Second, it is much harder to establish a counterfactual for an individual household than for the economy as a whole. And, third, this method does not control for the unobserved components of a household's response to a shock.

TOPIC 255: GENERAL EQUILIBRIUM AND SIMULATION MODELS

- A computable general equilibrium (CGE) model of an economy is a set of equations that aims to quantify the main interrelationships among households, firms, and government in an economy. CGE models range from just a few to many hundreds of equations.
- In principle, they may be used to simulate the effects of poverty reduction interventions. Unfortunately, CGE models are technically difficult to build, are typically highly aggregated (which makes it difficult to identify the effects of policies on income distribution and poverty with much precision), require considerable data to construct the underlying social accounting matrix, and produce results that are sensitive to the assumptions made about the parameters.
- They have been used, however, with some success to evaluate the economic and distributional effects of such interventions as programs to reduce HIV/AIDS, food subsidies, and trade policies.
- The International Food Policy Research Institute (IFPRI) has developed a standard CGE model that has been applied to a number of problems in developing countries (Loefgren, Harris, and Robinson 2001).

TOPIC 256: HOUSEHOLD PANEL IMPACT ANALYSIS AND SELF-RATES RETROSPECTIVE EVALUATION

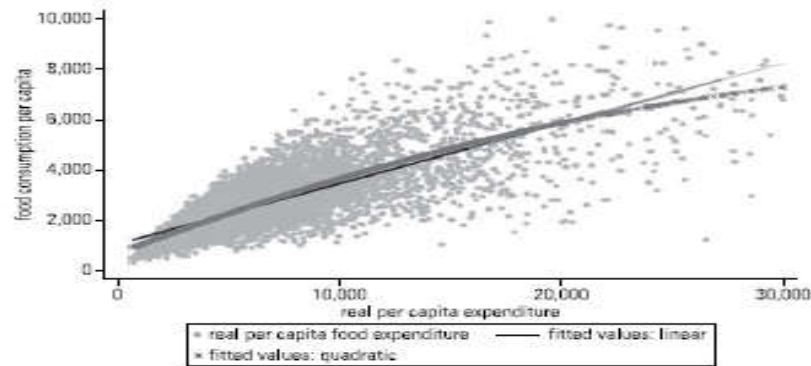
- If we have panel data on households that is, data on households from both before and after the shock then we can compare the situation of each household before and after the shock.
- By including household fixed effects in our estimating equation (that is, a separate dummy variable for each household), we can largely eliminate the effects of “time-invariant household and area-specific heterogeneity” (that is, the special or unique features of households, many of which are unobservable, such as whether the head is an alcoholic, or sick, or entrepreneurially inclined).
- Again, the main difficulty here is that a before-and-after comparison does not establish an adequate counterfactual.
- For instance, if the income of a household in the Philippines fell between 1996 and 1998, how do we know that it was due to the 1997 financial crisis? It might have been caused by some other event a family member falls ill, the village suffers from drought, and so on.
- No survey is ever complete enough to capture every conceivable relevant explanatory variable.

TOPIC 257: IMPORTANCE OF REGRESSION FOR POVERTY ANALYSIS

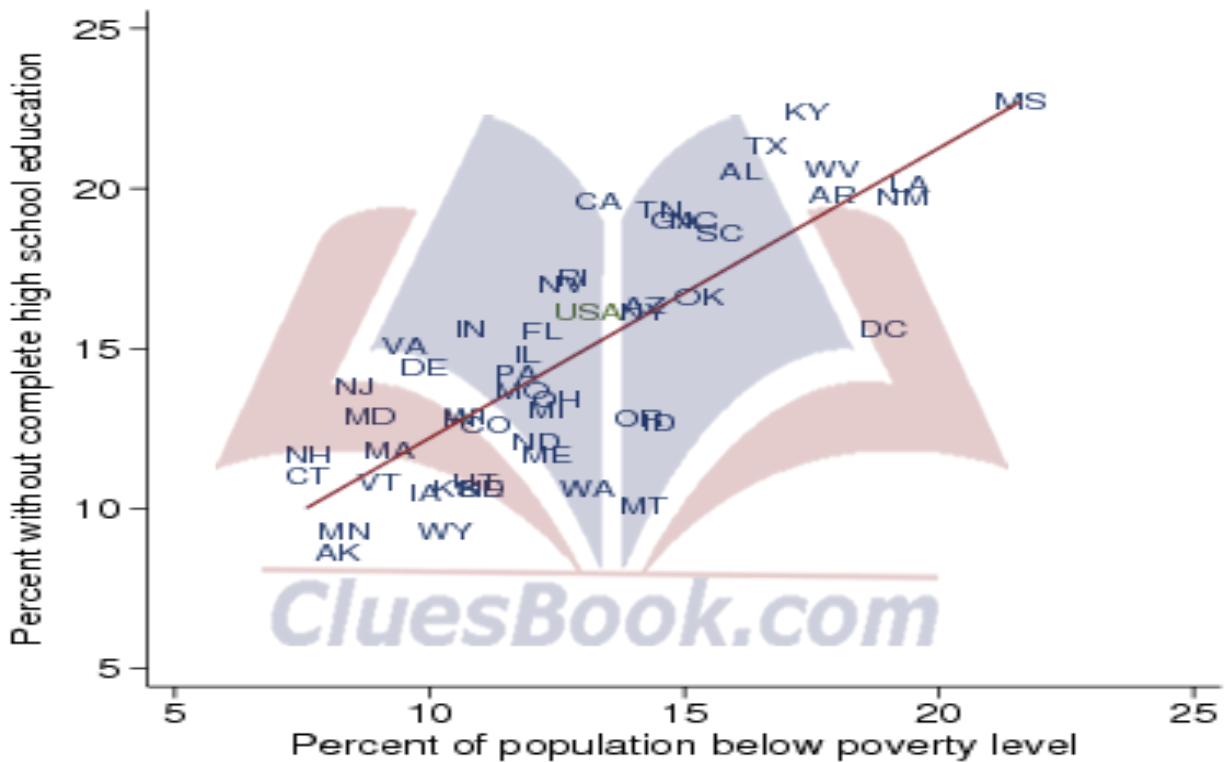
- Regression is a useful technique for summarizing data and is widely used to test hypotheses and to quantify the influence of independent variables on a dependent variable.
- It uses an example to introduce the key notions of goodness of fit and statistical significance (of the coefficient estimates).
- There may be errors in the measurement of the variables, some relevant variables may be omitted or unobservable, “dependent” and “independent” variables may in fact be determined simultaneously, the sample on which the estimation is based may be biased, independent variables may be correlated (“multicollinearity”), the error term may not have a constant variance, and outliers may have a strong influence on the results.
- It suggests solutions to these issues, including the use of more and better data, fixed effects (if panel data are available), instrumental variables, and randomized experiments.
- Logistic regression has a binary dependent variable and is often used to explain why some people are poor and others are not. It explains how to interpret the results of logistic regression.

TOPIC 258: SCATTER PLOT OF POVERTY DATA

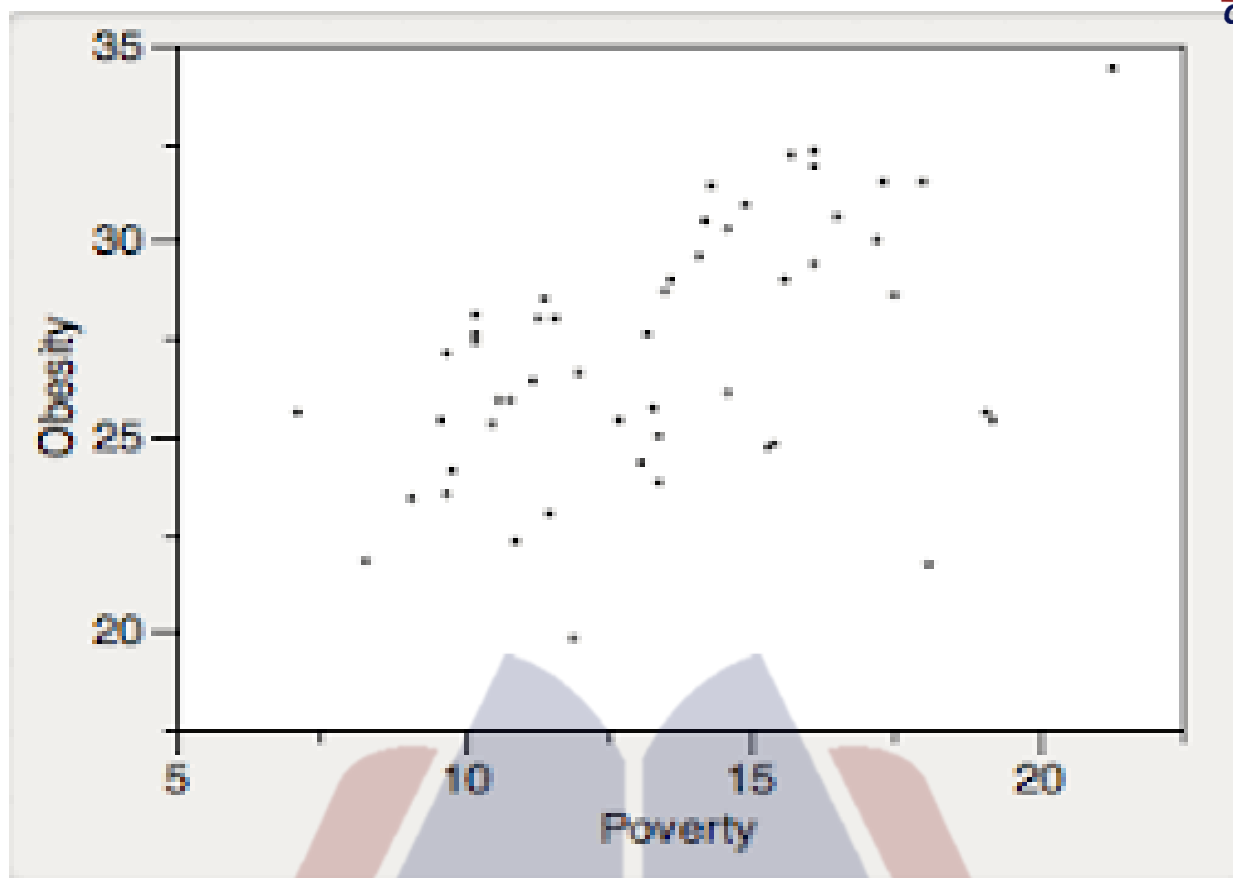
Figure 14.1 Scatter Plot and Regression Lines for Food Consumption per Capita against Total Expenditure per Capita, Vietnam, 2006



Source: Vietnam Household Living Standards Survey 2006.



Friedrich Huebler, September 2005, huebler.blogspot.com



TOPIC 259: REGRESSION LINE FOR POVERTY ANALYSIS

One solution is to estimate a regression line for instance using the regress command in Stata that summarizes the information. There are actually two regression lines shown in figure 14.1 a straight line (the continuous line) and a quadratic (the curve of x's).

Both of these lines capture the essential feature of the numbers, which is that food expenditure rises when total spending rises. The straight line estimated here (using STATA) may be written as follows:

$$(\text{Food spending per capita}) = 1,078 + 0.24 (\text{total spending per capita})$$

This shows that just under a quarter of any additional spending is devoted to food; in economic jargon, the marginal propensity to spend on food is 0.24. The quadratic curve shown in figure 14.1 may be written as follows:

$$(\text{Food spending per capita}) = 725 + 0.33 (\text{total spending per capita}) - 0.0038 (\text{spending/capita})$$

It follows from this equation that as total spending rises, food spending rises but less quickly an example of Engel's Law at work. For someone who is very poor, almost a third of incremental spending goes to food, but as per capita spending levels rise, the squared term becomes increasingly important and moderates the extent to which extra spending is devoted to food.

TOPIC 260: THE VOCABULARY OF REGRESSION ANALYSIS

Suppose that we are interested in explaining why some households have higher levels of consumption per capita than others. This is the dependent variable, conventionally labeled y . For each of the N households, we have a different value of y_i , $i = 1, \dots, N$. On the basis of theory,

or prior practice, we have some variables that we believe “explain” differences across households in consumption per capita—for instance, the educational attainment of adult household members or whether a household lives in an urban area. These are the independent variables, sometimes referred to as the covariates, and usually are denoted by $X_1, X_2, \dots, X_k$, if there are k variables.

We may write the true linear relationship between the independent and dependent variables, for the case with two covariates, as follows

$$y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i.$$

Here, β_0 is the intercept (or constant term), and the β_j are the coefficients (or slopes) of the X variables. We have information on the y and X variables, and have to estimate the β coefficients, which typically is done using statistical software such as Stata, EVIEWS, SPSS, or SAS. In practice, the independent variables never “explain” the dependent variable exactly; this is why equation includes a random error ε_i , which picks up measurement error as well as the effects of unobservable (and unobserved) influences.

By the nature of its construction, we cannot measure ε_i directly. But for the purposes of statistical inference, we need to know how the random errors are distributed. Ideally, we would like the error terms ε_i to be identically and independently distributed following a normal distribution with mean 0 and constant variance σ^2 . In practice, this may not always be reasonable, in which case we may need to adapt the model in equation, as explained below.

Although the true ε_i errors cannot be observed directly, we can estimate them. First estimate the coefficients in equation; by convention, these estimated values are typically written as $\hat{\beta}$. Now apply these coefficient estimates to the independent variables to get the predicted values of y , which are usually written as $(\hat{y})$, as follows:

$$\hat{y}_i = \hat{\beta}_0 + \hat{\beta}_1 X_{1i} + \hat{\beta}_2 X_{2i}.$$

Now, we may compute the *residual*, defined as which is the difference between the actual value of y and the value as predicted by the model that we are using. If equation fits well, these residuals will be very small relative to y .

The most common method for estimating linear regression equations such as that in equation is ordinary least squares (OLS). It essentially picks estimates of the coefficients that minimize the sum, over all the observations, of the squared residuals. This is not the only possible method of estimation, but it is so standard that it is the default in all statistical packages.

In the linear case shown here, the coefficient estimates are relatively easy to interpret. Take for example; it measures the effect that a one-unit increase in X_1 will have on y , holding all other effects constant (or, put differently, “controlling for the effects of other covariates”).

INTRODUCTION OF REGRESSION IN POVERTY ANALYSIS

TOPIC 261: EXAMPLE; INTRODUCTION OF REGRESSION IN POVERTY

We are now ready to look in more detail at an actual example of a regression estimate. Based on information from the Cambodian Socio-Economic Survey (SESC) undertaken in 1993–94, Prescott and Pradhan (1997, 55) estimate the following regression:

$$\ln(\text{Consumption/capita}) = 7.17 - 0.64 \text{ dependency ratio}$$

Where, R-Square = 0.47.

TOPIC 262: INTRODUCTION OF REGRESSION IN POVERTY: ROLE OF COEFFICIENTS

The coefficients (that is, -0.64 , $+0.15$, and so on) have the expected signs. For instance, more years of education are associated with higher consumption per capita. In this particular case, a household in which the adult members have, on average, one more year of education than an otherwise identical household, will have 6 percent higher consumption per capita. This is because an extra year of education is associated with an increase in $\ln(\text{consumption/capita})$ of 0.06, or about 6 percent.

TOPIC 263: INTRODUCTION OF REGRESSION IN POVERTY: ROLE OF R-SQUARE

The value of R-square is 0.47. This measures the goodness of fit of the equation and lies between 0 (no fit) and 1 (a perfect fit). Although one cannot say that a value of 0.47 is good or bad, it is certainly in line with what one would expect from a cross-section regression of this nature. It may often be interpreted as saying that 47 percent of the variation in the log of consumption per capita is “explained” by the independent (that is, right-hand side) variables, although here as always one must be cautious about inferring causality rather than mere correlation.

TOPIC 264: INTRODUCTION OF REGRESSION IN POVERTY: ROLE OF T-STATISTICS AND LEVEL OF SIGNIFICANCE

The numbers under the coefficients are t-statistics. The t-statistic is computed as the estimated coefficient divided by its standard error. The rule of thumb is that if the t-statistic is greater (in absolute value) than about 2, then we are roughly 95 percent confident that the coefficient is statistically significantly different from zero that is, we have not picked up a statistical effect by mistake. Most software packages automatically generate the p-value, which is one minus the degree of statistical significance of the coefficient. Thus, a p-value of 0.02 means that there is a 98 percent probability that the coefficient is different from zero. Low p-values, typically under 0.05 or 0.1, give us confidence in the estimates of the coefficients.

TOPIC 265: INTRODUCTION OF REGRESSION IN POVERTY: ROLE OF BINARY VARIABLE

The Phnom Penh variable is binary. This variable is set equal to 1 if the household is in Phnom Penh, and to 0 otherwise. This is also true of the “other urban” variable. The “rural” category has been left out (deliberately) and serves as the reference category. Thus we may say, in the above equation, that consumption per capita in other urban areas is about 23 percent higher than in rural areas.

TOPIC 266: PROBLEMS IN REGRESSION ANALYSIS; MEASUREMENT ERROR

Measurement Error

No variable is measured with complete precision, and many socioeconomic variables, including income and expenditure variables, are quite imprecise. In some cases, even a variable that should be easy to quantify, such as a respondent's age, may not be correct; in many surveys, too many people report their age as, say, 70 or 75, and too few report their age as 71 or 74.

Let S be the true measure of a variable, but assume that we only observe S^* . Thus:

$$S^* = S + w$$

Observed = True value + Random error

The effects of measurement error depend on whether it appears in the dependent or in the independent variables.

Case 1. Measurement Error in Y.

Suppose that we have the true equation:

$$Y = a + bX + \varepsilon$$

But all we observe is Y^* , so:

$$Y^* = a + bX + (\varepsilon + w).$$

In this case, the estimate of the coefficient b will not be biased, but the overall fit of the equation will be poorer, because the error term is larger and hence noisier.

TOPIC 267: PROBLEMS IN REGRESSION ANALYSIS; OMITTED VARIABLE BIAS

Suppose we leave a right-hand side ("independent") variable out of the equation that we estimate perhaps because it is unobserved, or unavailable, or just overlooked. Then the estimated coefficients on the remaining variables generally will be wrong if the included variables are correlated with the omitted variables.

To see this, suppose the correct model is

$$H_C = a + bS_M + cA_M + \varepsilon$$

Child's health Mother's schooling Mother's ability

In this case, the health of the child depends in part on the mother's ability, but this is a variable that we cannot observe. So when we regress H_C on S_M , we have, in effect, a compound error term $cA_M + \varepsilon$. In this case, it can be shown that

$$E(\hat{b}) = b + c \sigma_{SA}$$

Where, the last item is the covariance between schooling and (unobserved) ability. If higher ability leads to more schooling (as is likely, so $\sigma_{SA} > 0$), and if higher ability leads to better health (so $c > 0$), then the estimated value of b (that is) will be too high. In effect, the estimated value $\hat{b}$ is picking up ability as well as schooling effects, and in doing so, it overstates the contribution of schooling to child health.

PROBLEMS IN REGRESSION ANALYSIS IN POVERTY

TOPIC 268: PROBLEMS IN REGRESSION ANALYSIS; SIMULTANEITY BIAS

Many applied research problems come up against the problem of simultaneity bias. Although common, this can be a difficult problem to solve. We may illustrate it as follows: Suppose

$$\text{Child Health} = a + b \text{ Nutrients} + e$$

Our goal is to explain child health, and we believe, quite reasonably, that better-fed children will be healthier. But the problem here is that the child's health may determine how much the household feeds her or him. For instance, parents might feed a sick child more, in the hope that he or she will get better faster that way. But then we would see a negative relationship, whereby more nutrients could be associated in the regression analysis with poorer child health.

Formally, if there is simultaneity present, the estimate of the coefficient will generally be wrong. In our example, if parents provide better feeding to sick children, then the estimate will be too low. One solution is to include lots of predetermined variables in the estimated equation so that in the presence of simultaneity, its effect will be attenuated.

TOPIC 269: PROBLEMS IN REGRESSION ANALYSIS; SAMPLE SELECTIVITY BIAS

Frequently, observations are available only for a subset of the sample that interests us.

For instance, we might want to measure the spending of the very poor, but we have information only for people with a home. In this case, our sample would omit the homeless, and our results are likely to underestimate the true extent of poverty. Or again, we might want to know how much people would be willing to pay for piped water, but we have information only about willingness-to-pay for households that currently have piped water hardly a representative sample of the population at large. In both of these cases, the problem is that our data may not come from a random sample of the relevant population, and so our regression estimates risk being biased.

TOPIC 270: PROBLEM OF MULTICOLLINEARITY

- When the independent variable in a regression model is interrelated or is dependent on each other, multicollinearity is said to exist among the independent variables. Definition of (near) multicollinearity: when one of the independent variables can be written as a (near) linear combination of the other independent variables. Note: This is only a function of the predictor variables, response variable is not involved.
- Causes of multicollinearity
Including a variable that is computed from other variables in the equation (e.g. family income = husband's income + wife's income, and the regression includes all 3 income measure); In effect, including the same or almost the same variable twice (height in feet and height in inches)
The above all imply some sort of error on the researcher's part. But, it may just be that variables really and truly are highly correlated.
- Effects of multicollinearity
- Effect on estimates of coefficients: LS point estimates are conditional - they depend upon the correlated independent variables included in the regression model. Extreme multicollinearity can result in wrong signs and magnitudes of LS points estimates; consequently in incorrect conclusions about relationships between independent and dependent variables.

Effect on t statistics and associated p-value: when multicollinearity exists, the size of the t statistic and of the related p-value measure the additional importance of the independent variable x_j over the combined importance of the other independent variable in the regression model. Clearly, two or more correlated independent variable contribute redundant information.

Effect on the experimental region and prediction: prediction may not be too bad so long as a combination of values of the independent variables fall within the experimental region. However, multicollinearity can cause combinations of values of the independent variables that one might expect to be in the experimental region to actually not be in the experimental region. Effect on computational accuracy: can lead to serious rounding errors in the calculation of $(X'X)^{-1}$ and hence the LS point estimates.

- Diagnosing multicollinearity:
Pairwise analysis: scatterplots and correlation matrix;
None of the t-statistics for the individual coefficients is statistically significant, yet the overall F statistic is. This indicates that the model has significant overall utility, even though the model's individual independent variables do not appear to be very important. In particular, as variables are added, look for changes in the signs of effects (e.g. switches from positive to negative) that seem theoretically questionable. Such changes may indicate multicollinearity.
- Dealing with multicollinearity –
Try to avoid it by not including redundant independent variables in the regression model. Remove one or more of the highly correlated independent variables. Examining the correlations between variables and taking into account practical aspects and importance of the variables help in making a decision what variables to drop from the model. Adding more observations to the data used in building the regression model, this will usually decrease standard errors, so that the (apparent) multicollinearity is lessened. If unavoidable: use "ridge regression".

TOPIC 271: PROBLEM OF HETEROSCEDASTICITY

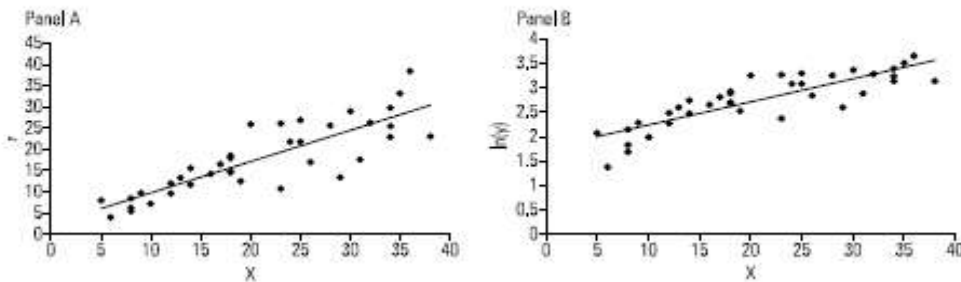
When working with cross-sectional data the numbers that come from household surveys one frequently encounters heteroskedasticity. This is the term used when the error in the regression model, ϵ_i , does not have a constant variance. The situation is illustrated in figure 14.3; the true relation here is:

$$y = 2 + 0.8 X$$

But it is clear from panel A that the relationship fits well at low values of X the observations are close to the line but is more imprecise at higher values of X.

Heteroskedasticity does not bias the estimates of the coefficients, so even if it is present, the estimates of the slopes will be correct. However, it reduces the efficiency with which the standard errors of the coefficients (and hence the t-statistics and p-values) are estimated. Sometimes the problem can be solved with a simple transformation: the picture illustrated in figure 14.3, panel B, shows the same relationship except that the dependent variable is now the natural log of y, $\ln(y)$, rather than y. In this case, there is no visible evidence of heteroskedasticity, and we can proceed satisfactorily with testing hypotheses and creating confidence intervals.

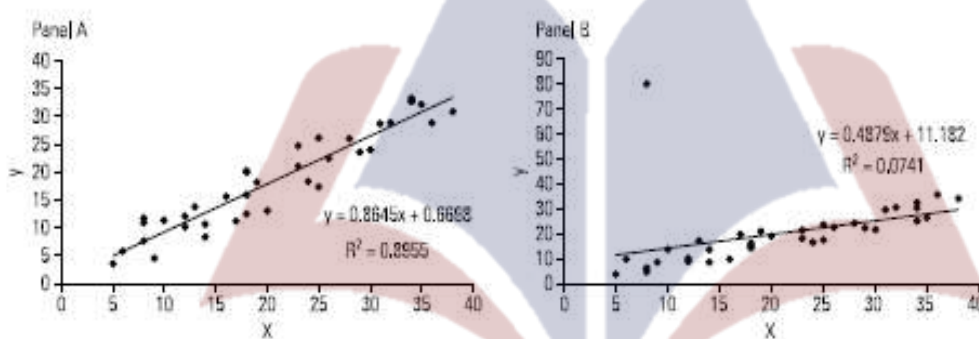
Figure 14.3 Heteroskedasticity Illustrated



TOPIC 272: PROBLEM OF OUTLIERS

One last problem is worth noting, which is that of outliers. Quite frequently, a small number of observations take on values that are far outside the range of what one would expect. Figure 14.4, panel A, shows a hypothetical data set with a cleanlooking estimated regression line. Panel B shows the same data, except that in the case of one observation the value of the y variable is 80.2 rather than 8.02. This is an outlier, and it had a major effect on the fit and form of the estimated equation.

Figure 14.4 Outliers Illustrated



Source: Authors' creation.

TOPIC 273: SOLVING ESTIMATION PROBLEMS

As a general rule, it is not easy to solve the estimation problems outlined above. However, here are some possibilities:

- Get more, or better, data. This is typically expensive or difficult, but is occasionally possible. More data are useful in dealing with multicollinearity; better data are essential if measurement error is a problem.
- Use fixed effects. Consider the following problem: We would like to estimate the determinants of rice production (Q), and believe that output will be influenced by fertilizer use (F), and the inherent ability of the farmer. Thus,

Rice output = $a + b \text{ fertilizer input} + c \text{ ability} + \epsilon$.

The problem is that ability is unobserved, so we end up estimating

Rice output = $d + e \text{ fertilizer input} + w$.

TOPIC 274: LOGISTIC REGRESSION

Often, the research issue of interest is whether a household is poor or not, owns a car, has another child, or works in industry.

These cases all have a point in common: the dependent variable is binary, taking on values of 1 if the event is true, or 0 otherwise.

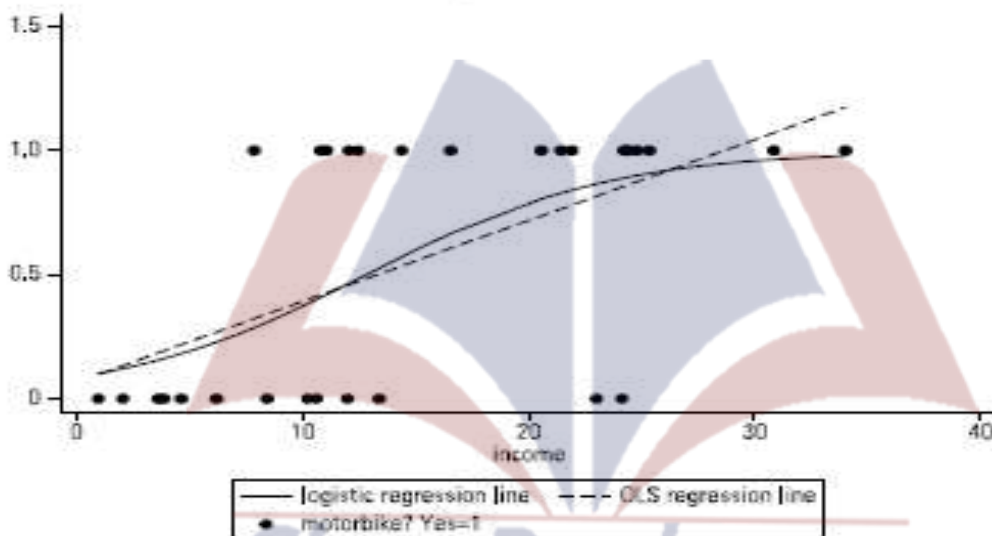
Mechanically, one can apply OLS to this situation. But the result is not satisfactory, since the predicted values of the equation might, in some cases, be higher than 1 or lower than 0, which makes little sense.

This is illustrated in figure 14.5 for some hypothetical data. The horizontal axis shows household income per capita, and each dot is set equal to 1 if the household owns a motorbike, or 0 if it does not own a motorbike. Our interest is in fitting a curve to these observations.

The OLS line is shown as the dashed line in figure 14.5; for income above 30, it predicts that the probability of owning a motorbike is greater than 1. The thick line in figure 14.5 is based on a logistic regression, which is of the form and calls for some further explanation.

$$y' = \frac{1}{1 + e^{-xp}}$$

Figure 14.5 Logistic Regression Compared with OLS



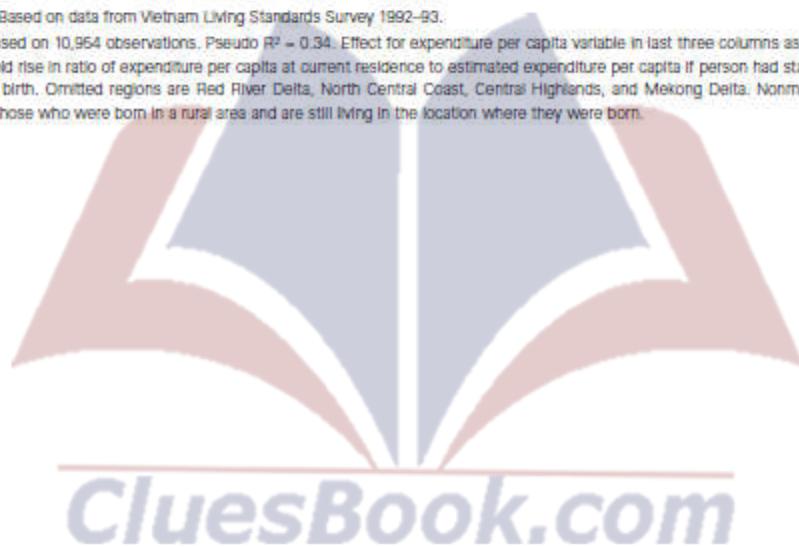
TOPIC 275: REGRESSION RESULTS ON RURAL-URBAN MIGRATION

Table 14.1 Logistic Model of Rural-Urban Migration, Vietnam, 1993

	Coefficients	P-values	Estimated probability of migrating when independent variable changes by one unit and initial probability is (percent):		
			3.0	7.0	11.0
Dependent variable					
Does person migrate from rural to urban area? (Y=1)					
Independent variables:					
Age of person (years)	0.438	0.000	4.6	10.4	16.1
Years of education	0.117	0.000	3.4	7.8	12.2
Δ ln(expenditure per capita)	2.368	0.000	24.8	44.5	56.9
Male household head (Y=1)	-1.498	0.000	0.7	1.6	2.7
Size of household	0.105	0.000	3.3	7.7	12.1
Married (Y=1)	1.700	0.000	14.5	29.2	40.4
Divorced (Y=1)	1.618	0.000	13.5	27.5	38.4
Separated (Y=1)	1.176	0.026	9.1	19.6	28.6
Widowed (Y=1)	1.146	0.000	8.9	19.1	28.0
Regional effects					
Northern Uplands	0.558	0.000	5.1	11.6	17.7
Central Coast	0.905	0.000	7.1	15.7	23.4
Southeast	1.404	0.000	11.2	23.5	33.5

Source: Based on data from Vietnam Living Standards Survey 1992-93.

Note: Based on 10,964 observations. Pseudo $R^2 = 0.34$. Effect for expenditure per capita variable in last three columns assumes a 2.72-fold rise in ratio of expenditure per capita at current residence to estimated expenditure per capita if person had stayed at place of birth. Omitted regions are Red River Delta, North Central Coast, Central Highlands, and Mekong Delta. Nonmigrants include those who were born in a rural area and are still living in the location where they were born.



TYPES AND EFFECTS OF TAXATION ON POVERTY

TOPIC 276: THE EFFECTS OF TAXATION AND SPENDING ON INEQUALITY AND POVERTY:

- The purpose of incidence analysis is to determine who bears the burden of taxes and who benefits from government spending.
- This is one of the elements needed in formulating tax and expenditure policy.
- A tax is progressive if it takes a rising proportion of income (or expenditure) as one moves from poor to rich; a regressive tax represents a higher burden (relative to income or expenditure) on the poor than the rich.
- The progressivity of tax and spending may be seen visually using Lorenz and concentration curves, and summarized using the Kakwani measure or tax progressivity or the Reynolds-Smolensky measure of redistributive capacity.
- To measure the incidence of a tax, first make assumptions about the true ("effective") incidence; then determine the effective tax rates.
- Combine these with household survey data to estimate the burden on each household and hence on groups.
- The discussion is illustrated with the case of the Peruvian value added tax (VAT).
- To measure benefit incidence, begin by estimating the unit value of government subsidies (for example, to health or education). Then identify the beneficiaries, using household survey data, and combine this information with the unit values to get the benefit incidence.
- Examples discussed include education in Peru and health in Ghana.
- There are a number of problematic aspects of incidence analysis.
- Most studies measure average incidence, but marginal incidence (for example who gains from more spending on health) is typically more useful.
- The pattern of tax incidence can look quite different depending on whether one uses income or expenditure to rank households.
- The valuation of the benefits of government spending is difficult, and the usual procedure (that is, use of the unit costs of services provided) is not entirely satisfactory.
- Even good information on incidence is rarely sufficient to generate policy implications and additional modeling usually is required.
- Public expenditure analysis is useful only if the policy setting is right. Greater use of tax incidence analysis probably has more potential to inform policy.

TOPIC 277: WHO IS BENEFICIAL OF GOVT SPENDING?

Governments raise tax revenue and spend it on such things as education, health, and pensions. But who benefits most from the spending? And who really bears the burden of the taxes? The answers to these questions are to be found in benefit and tax incidence analysis. This chapter sets out the steps required to undertake such analyses, evaluates the methodological choices that the researcher needs to make, and illustrates the discussion with some real examples.

It is useful to start by providing some context. Economists typically identify three main roles for government.

- First, governments have a role to play in ensuring economic efficiency, in part by setting and enforcing the rules of market interactions, and in part by acting to correct for market failures. The latter category includes efforts to check the power of monopolies, provide public goods such as defense and basic research, and tackle negative externalities such as air pollution.

- The second role of government is to maintain macroeconomic stability, for instance, by keeping inflation low and moderating the business cycle of boom and bust. Third, governments have a role to play in enhancing equity, although the extent to which they should do this is controversial.

Incidence analysis only measures the effects of government spending and revenues on the equity dimension. Such information is an essential input into informed decision making, but there is no reason to expect it to be the only determinant of the way spending and taxes are, or should be, structured.

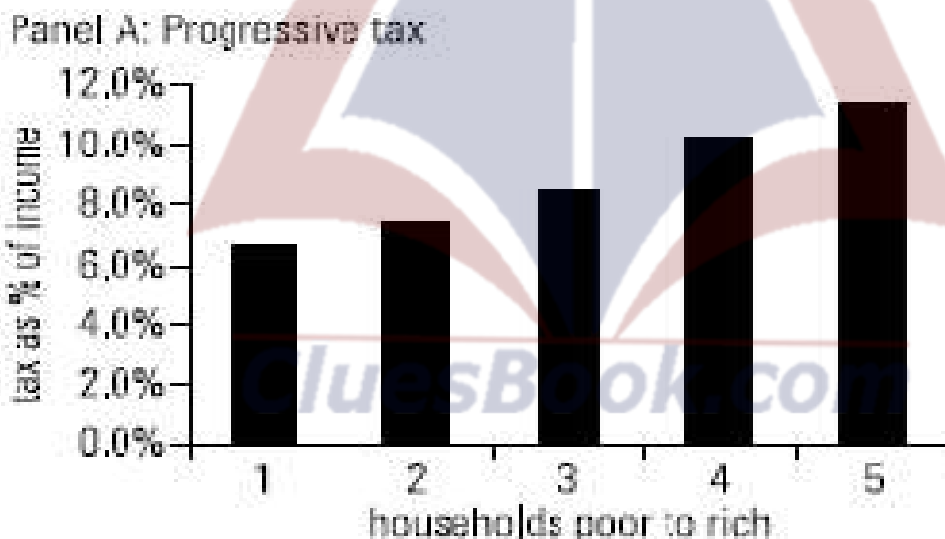
TOPIC 278: WHO IS BENEFICIARY OF TAX BEING PAYED?

The basic idea behind benefit or tax incidence is to determine how much each person gains from government spending or loses because of taxes paid. The distribution of these gains or losses can then be compared with a reference distribution such as income or consumption per capita to determine the degree of progressivity of the spending.

Suppose that we have successfully identified how much each person in our sample pays in, say, and personal income tax (PIT). We now need to present the results in a clear and compelling way.

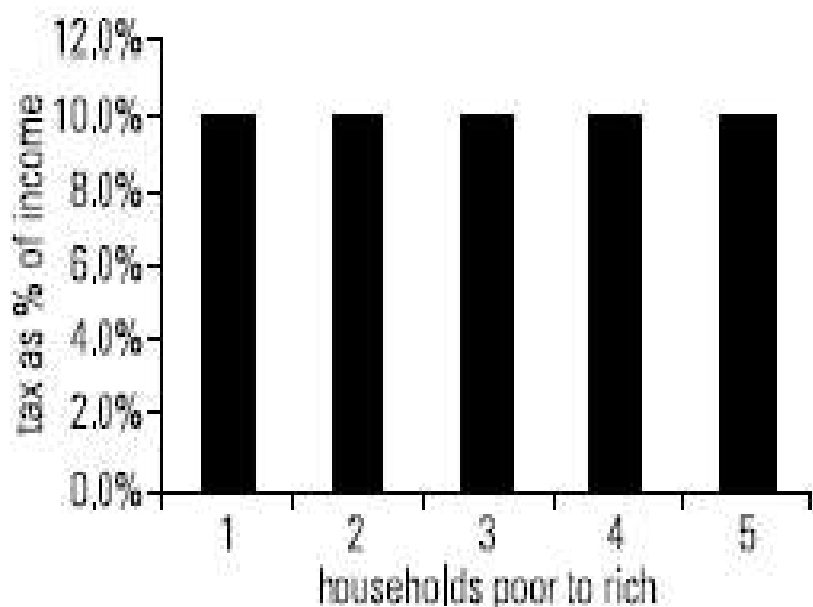
TOPIC 279: TYPES OF TAXATION; PROGRESSIVE AND POVERTY IMPLICATIONS

A progressive tax is a tax in which the average tax rate (taxes paid ÷ personal income) increases as the taxable amount increases.



TOPIC 280: TYPES OF TAXATION; PROPORTIONAL AND POVERTY IMPLICATIONS

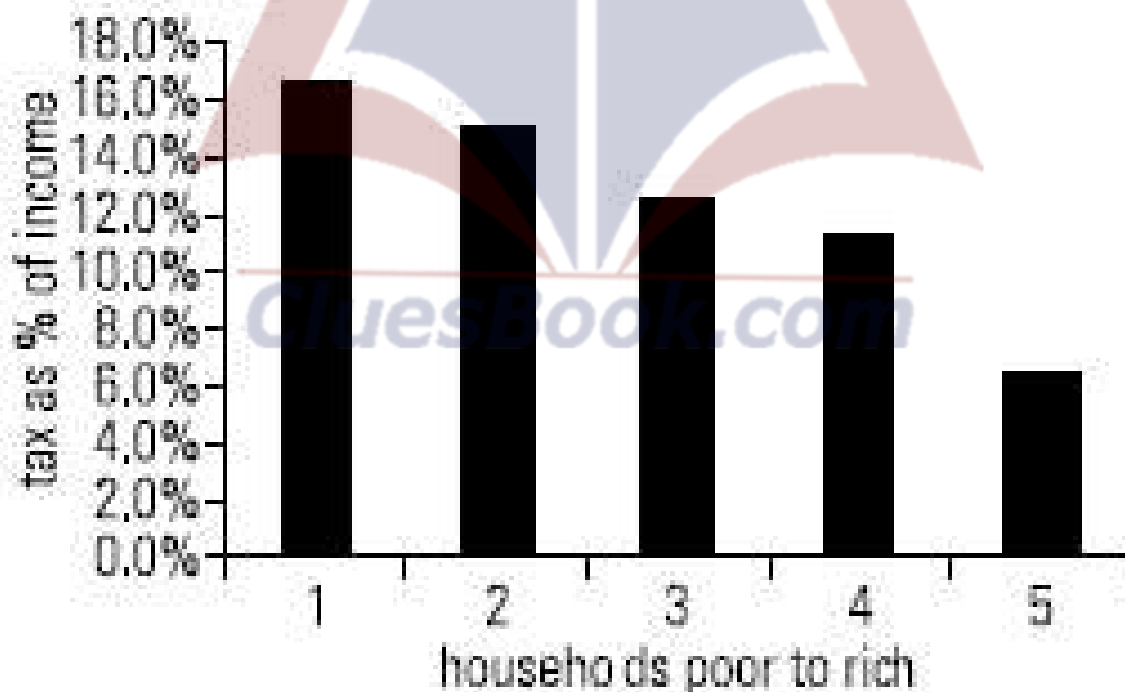
A proportional tax is an income tax system where the same percentage of tax is levied on all taxpayers, regardless of their income. A proportional tax applies the same tax rate across low, middle, and high-income taxpayers.



TOPIC 281: TYPES OF TAXATION; REGRESSIVE AND POVERTY IMPLICATIONS

A regressive tax is a tax applied uniformly, taking a larger percentage of income from low-income earners than from high-income earners. It is in opposition to a progressive tax.

Panel C: Regressive tax



The simplest approach is to tabulate the results by quintile (or decile). This is illustrated in table 15.1 for some hypothetical numbers. Column (2) sets out the mean income of five groups of individuals, sorted from poorest to richest; the share of each in total income is shown in column (3). Now suppose that the mean tax payments per person are those shown in column (4). In column (5), we compute the tax paid as a percentage of income.

In this example, the proportion of income that goes to pay the tax rises as income rises, and so the tax is considered to be progressive. This may be seen in another way. The figures in column (6) show that the proportion of total tax paid by the poorest group (4 percent) is less than its share of total income (6 percent), and that this situation reverses as one moves to the higher-income individuals.

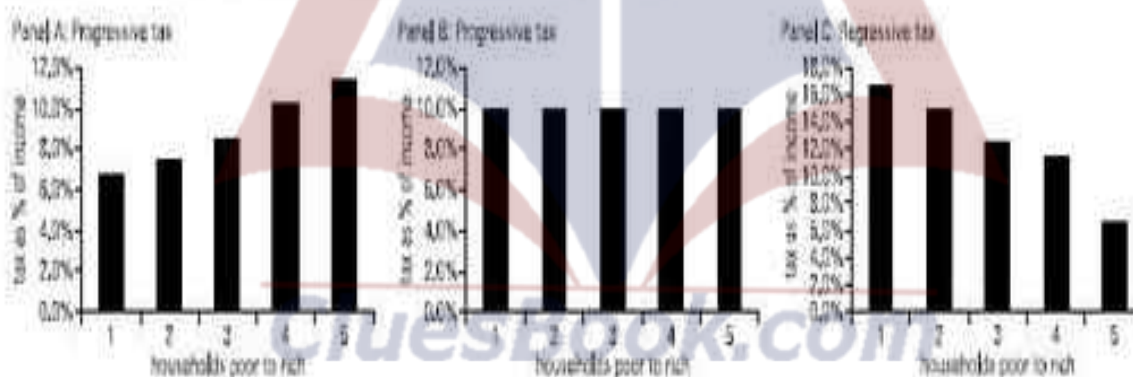
Table 15.1 Progressivity Illustrated

Case 1: Progressive tax						Case 2: Proportional tax			Case 3: Regressive tax		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Income	Percent of total	Tax paid	Percent of income	Percent of total	Tax paid	Percent of income	Percent of total	Tax paid	Percent of income	Percent of total
1	1,200	6.0	80	6.7	4.0	120	10.0	6.0	200	16.7	10.0
2	2,000	10.0	150	7.5	7.5	200	10.0	10.0	300	15.0	15.0
3	3,200	16.0	270	8.4	13.5	320	10.0	16.0	400	12.5	20.0
4	4,400	22.0	450	10.2	22.5	440	10.0	22.0	500	11.4	25.0
5	9,200	46.0	1,050	11.4	52.5	920	10.0	46.0	600	6.5	30.0
All	20,000	100.0	2,000	10.0	100.0	2,000	10.0	100.0	2,000	10.0	100.0

Source: Authors' creation.

TOPIC 282: EXAMPLE OF PROGRESSIVE, PROPORTIONAL AND REGRESSIVE TAX

Figure 15.1 Histograms for Income Tax as a Percentage of Income, Three Cases



Source: Based on the hypothetical data in table 15.1.

IMPACT OF TAX ON INEQUALITY

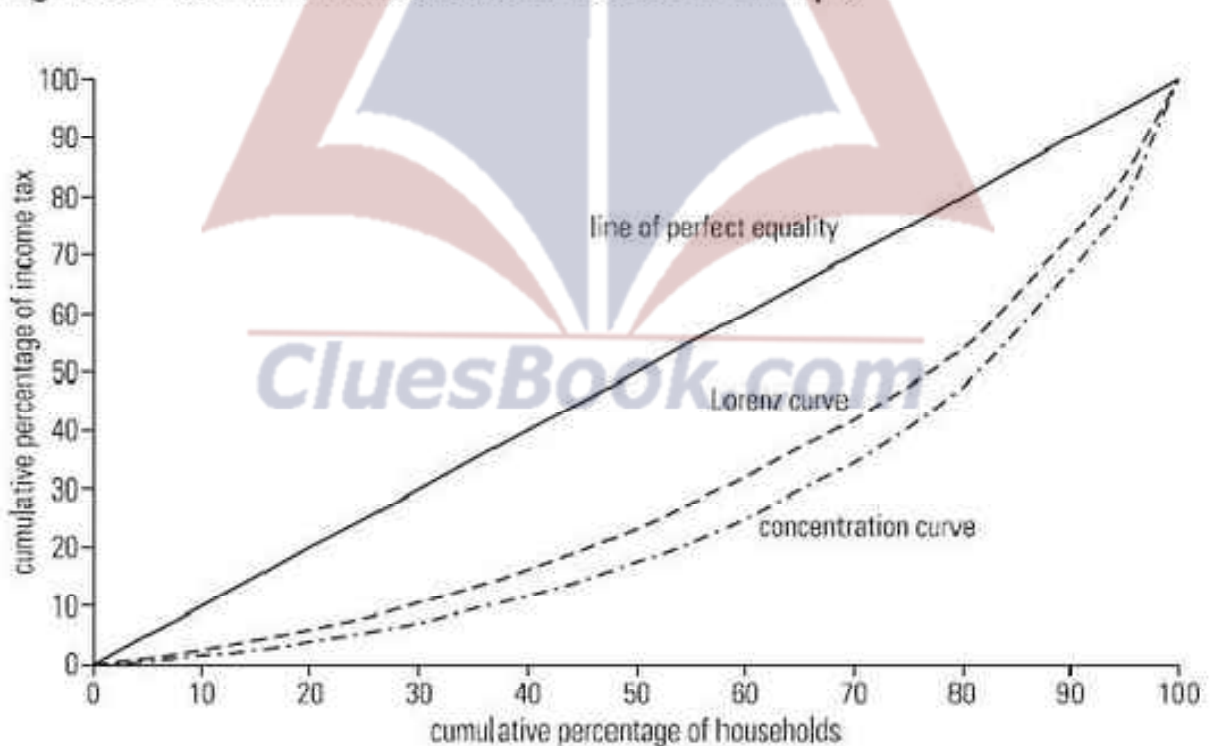
TOPIC 283: IMPACT OF TAX ON INEQUALITY; KAKWANI MEASURE

To compute the **Kakwani measure of tax progressivity**, use the following steps:

- Compute the Gini coefficient for income (that is, $A/(A+B)$, where A is the area between the Lorenz curve and the Line of Perfect Equality and B is the area under the Lorenz curve), G_Y .
- Compute the concentration coefficient (or “quasi-Gini coefficient”) from the tax concentration curve (that is, $C/(C+D)$, where C is the area between the Concentration Curve and the Line of Perfect Equality, and D is the area under the Concentration Curve), CT .
- Compute the Kakwani measure as $K = -[G_Y - CT]$. Note that some authors define the term without the initial negative sign, so care is needed when making comparisons between one study and the next.
- The measure will be positive for a progressive tax, zero for a tax that is proportional, and negative for a regressive tax. In our example, based on Case 1 in table 15.1, $G_Y = 0.387$, $CT = 0.473$, so $K = 0.086 > 0$, therefore the tax is progressive.

One may determine whether the result is statistically significant by bootstrapping to estimate the standard error of the estimate of K .

Figure 15.2 Lorenz and Concentration Curves for PIT Example



TOPIC 284: IMPACT OF TAX ON INEQUALITY; REYNOLDS-SMOLENSKY MEASURE

The Reynolds-Smolensky measure of the redistributive capacity of a tax solves this problem. A popular version of this measure is given by the following:

$$RS2 = GY - GY-T$$

Where, GY is the Gini coefficient for pre-tax income and $GY-T$ the Gini coefficient for post-tax income. In our example $RS2 = 0.387 - 0.378 = 0.0096 > 0$.

- Positive, indicating a progressive tax, because the after-tax distribution of income (as measured by $GY-T$) is more equal than its pretax distribution (as measured by GY)
- Relatively large, indicating that this tax has considerable redistributive potential.

In other words, this tax is a good candidate for serious efforts to make the tax code more progressive.

The redistributive capacity of a tax depends both on its progressivity and on the tax rate. It can be shown that $RS2 \approx (t/(1-t)) K$, where t is the average tax rate relative to pretax income.¹ In our example, the tax rate averages 10 percent, so we have $(0.1/(1-0.1)) \times (0.086) \approx 0.0096$.

TOPIC 285: TAX INCIDENCE

Any serious discussion of tax reform needs to include information about the redistributive effects of tax changes.

Four steps are required:

- For each tax, make appropriate assumptions about who bears the true burden of the tax.
- Determine the tax rates.
- Apply the information from 1 and 2 to household survey data to compute the tax burden on each household.
- Present the results in an informative way.

Table 15.2 Incidence Assumptions for Study of Tax Incidence in Lebanon, 2004

Tax	Incidence assumption
Wages and salaries	Borne by earners (because their take-home pay would rise if there were no tax).
Tax on personal companies and small businesses	Tax falls on owners/entrepreneurs.
Tax on corporate income (CIT)	Borne half by consumers (via higher prices) and half by owners. (Note: This is controversial, but is reasonable if capital is somewhat, but not completely, mobile internationally.)
Dividends tax	Borne by those who receive dividends.
Tax on interest	Burden falls on depositors; with mobile capital, banks are assumed to have limited ability to raise interest rates paid.
Built property tax	Borne by property owners. (Note: For land, this is the classical case examined by Henry George (1912).)
Property registration fees	Born by owners of real estate.
Inheritance tax	Borne by owner of assets.
Value added tax	Shifted onto consumers.
Fuel excise	Shifted onto consumers because of horizontal supply curve.
Tobacco excise	Shifted onto consumers because of horizontal supply curve.
Car taxes (including annual registration fees)	Shifted onto consumers.
Customs duties	Shifted onto consumers.
Other taxes (especially stamp duties)	Shifted onto consumers.

Source: Haughton 2004.

TOPIC 286: BENEFIT INCIDENCE

- The goal here is to work out how much each person gains from government spending, and compare the distribution of this spending with a point of reference such as the distribution of per capita consumption; Demery (2000) provides an excellent survey.
- Although some types of government spending health, education, and social Subsidies can easily be attributed to beneficiary households, almost half of government spending cannot be so allocated.
- It is difficult, perhaps impossible, to determine who benefits most from spending on such items as the army, police, diplomatic service, judicial system, or pensions for public servants.
 - The first step in benefit incidence analysis is to estimate the value of unit subsidies: how much does the government subsidize each high school pupil, each visit to a rural health clinic, each recipient of school meals, and so on? This information is not to be found in household survey data, except perhaps for some direct social subsidies to households.
 - It is important to base the measures of unit subsidies on actual rather than budgeted spending, and even then some digging may be required.
 - The second step is to identify the coverage of the government services or subsidies and impute it to users. In this case, household survey data are needed to provide information on how many household members go to school and at what level, how many people visited a health clinic during the year, and so on.
 - The third and final step is to aggregate and present the results in a useful way. To give a flavor of how this might be done, we next present a case study of education spending in Peru; in the annex to this chapter, we present a short case study of the incidence of health spending in Ghana.

TOPIC 287: ISSUES IN BENEFIT INCIDENCE ANALYSIS

- Benefit incidence analysis (BIA) considers who (in terms of socio-economic groups) receive what benefit from using health services.
- The most important ingredient for an accurate and comprehensive benefit incidence analysis is a household survey that collects data on *all* outpatient visits and hospital admissions during specified recall periods, rather than only on one visit or admission as is the case in most 'standard' surveys at present, and which provides disaggregated data on the type of provider used.
- Benefit incidence analysis does not have to be confined to assessing the distribution of public subsidies for health services; instead, it can be a powerful means of evaluating the performance of the service delivery component of the overall health system.
- The appropriateness of the distribution of benefits from using health services should be assessed relative to the distribution of need for health care across socio-economic groups.
- While traditionally BIA has focused on only publicly funded health services, to assess whether or not public subsidies are 'pro-poor', the same methodological approach can be used to assess how well the overall health system is performing in terms of the distribution of service benefits. This is becoming increasingly important in the context of the growing emphasis on promoting universal health systems.
- To conduct a BIA, a household survey dataset that incorporates both information on health service utilization and some measure of socio-economic status is required.
- The other core data requirement is unit costs of different types of health service.

- When utilization rates are combined with unit costs for different health services, the distribution of benefits from using services, expressed in monetary terms, can be estimated and compared with the distribution of the need for health care.
- This paper aims to provide an introduction to the methods used in the 'traditional' public sector BIA, and how the same methods can be applied to undertake an assessment of the whole health system.
- We consider what data are required, potential sources of data, deficiencies in data frequently available in low- and middle-income countries, and how these data should be analyzed.

TOPIC 288: PUBLIC EXPENDITURES AND POVERTY REDUCTION

- Demery (2003, 41), who has written lucidly and extensively on benefit incidence, cautions that "public expenditures can be effective in reducing poverty only when the policy setting is right."

For example, it makes little sense to spend on agricultural extension if an overvalued exchange rate makes farming unprofitable. More generally, benefit incidence analysis only makes sense if spending decisions are "based on outcomes and impacts" rather than on continuing line items from one year to the next. And of course the analysis needs to rest on "a sound understanding [by the government] of the needs and preferences of the population at large," and not on the whims of a dictator or kleptocrat.

- A strong case can be made that incidence analysis is more helpful on the tax than the spending side.
- Governments change taxes frequently, sometimes in minor increments, occasionally as major reforms. These changes have important incidence effects, yet decision makers in most less-developed countries are rarely provided with information on how tax changes affect poverty and income distribution.
- Once household survey data, with information on both income and expenditure, are available, this situation can be remedied easily.

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USING SURVEY DATA: SOME CAUTIONARY TALES-I**TOPIC 289: USING SURVEY DATA: SOME CAUTIONARY TALES**

It illustrates some of the major problems of data quality that every analyst has to confront. These problems are presented in the form of the following 11 “cautions”:

- Do the sampling right.
- Use a consistent recall method.
- Use a consistent recall period.
- Remember that price indexes matter (a lot).
- Use consistent questions.
- Adjust for nonresponse bias (if possible).
- Define expenditure consistently.
- Value own-farm income properly.
- Distinguish between values that are zero and those that are missing.
- Use expenditure per capita, not expenditure per household.
- Use weights when they are needed.

Be alert to extravagant claims of large jumps in poverty or inequality, and retain a healthy skepticism rather than cynicism. Above all, know your data.

TOPIC 290: CAUTION 1. DO THE SAMPLING RIGHT

The information in table 16.1 comes from household surveys undertaken in Malawi in 1997 and 2004. The numbers show remarkable progress a 21 percent increase in mean income, an enormous reduction in inequality, and a sharp drop in the headcount poverty rate. And this occurred during a period when the Malawi's real gross domestic product (GDP) per capita actually fell by 1.3 percent per year.

Are these numbers too good to be true? The answer is yes! For some reason perhaps due to missing information—more than 3,000 households were dropped from the 1997/98 sample when computing the statistics for that year; the reported sample is 6,586 households in 1997/98 and 11,280 in 2004–05. If the households were dropped randomly, then the results in table 16.1 may still be usable, but there is a suspicion that relatively high-income households were more likely to have been excluded. This would imply that the 1997/98 numbers understate income and overstate poverty, and that the improvement in incomes and poverty incidence shown in table 16.1 are overstated.

Quite apart from the sampling problem, it turns out that the questions used in the 2004–05 survey were more extensive than those used in the 1997/98 survey, so that the measures of expenditure cannot be directly compared between the two. An effort has been made to impute expenditure per capita for items that were not included in the 1997/98 questionnaire. To see how this works, suppose that only the latter questionnaire asked households how much they spent on shoes; then, using the data from the 2004–05 survey, one could regress the value of spending on shoes against other household characteristics, such as total spending on food, the number of adult members, and so on. This estimated equation can then be applied to the data from the 1997/98 survey to generate the predicted (“imputed”) value of spending on shoes.

The process generates a poverty rate of 53.9 percent for 1997/98, which is more directly comparable to the 52.4 percent rate actually observed in 2004–05 (Government of Malawi 2006). Based on these adjusted numbers, one can conclude that the poverty rate barely fell between 1997/98 and 2004–05.

Table 16.1 Income, Poverty, and Inequality in Malawi, 1997/98 and 2004

Survey year	Mean income per person per year, Malawian kwacha (prices of 1997/98)	Gini coefficient	Headcount poverty index (%)
1997/98	399.2	0.503	65.9
2004/2005	483.2	0.390	52.4

Sources: PovcalNet (at <http://research.worldbank.org/PovcalNet/doc/MWI.html>); Government of Malawi (2006).

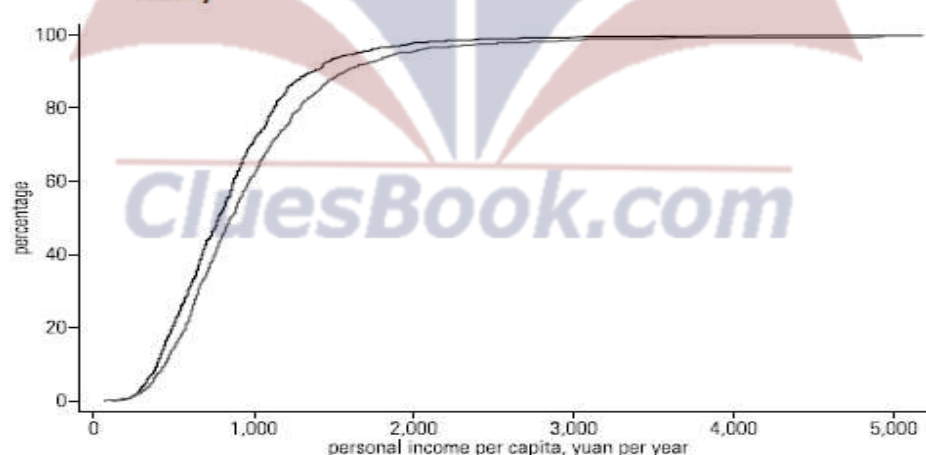
TOPIC 291: CAUTION 2. USE A CONSISTENT RECALL METHOD

A poverty monitoring survey undertaken in the southwest of China in 1995–96 yielded the following information:

- 1995 mean income per capita: 855 yuan.
- 1996 mean income per capita: 993 yuan.

This represents a 16 percent increase in per capita income in one year. Even by Chinese standards, this is a rapid increase too rapid to be plausible. The cumulative distribution curves for the two surveys are shown in figure 16.1. Part of the explanation is due to the fact that the two surveys used different methods to collect information on income and expenditures. The 1995 survey used a one-time recall method, whereas the 1996 survey required households to keep daily diaries. It is well known that when the questions are more detailed, or when information is recorded in a timelier fashion, the amounts (spent or earned) will be greater. Of course, this leaves us with a serious problem: there is no easy way to determine how much of the observed 16 percent rise in income was due to a real increase in income and how much to the change in survey procedures.

Figure 16.1 Cumulative Distribution Functions, Southwest China Poverty Monitoring Survey



Source: Shaohua Chen, personal communication.
Note: Date for 1995 (upper line) and 1996 (lower line).

TOPIC 292: CAUTION 3. USE A CONSISTENT RECALL PERIOD

Officially, the headcount poverty rate in India fell from 39 percent in 1987–88 to 36 percent in 1993–94 and then dropped dramatically to 26 percent in 1999–2000.

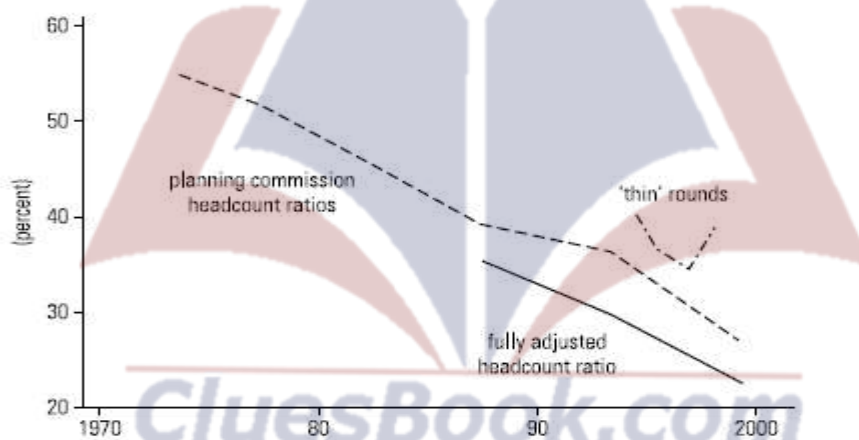
The latter results were quickly criticized: was it really possible that poverty fell so rapidly after a period of only modest decline? The surprise was all the greater because an unofficial estimate of poverty, based on a “thin” (that is, smaller scale) survey undertaken in 1998, had shown a poverty rate of 39 percent.

It turns out that there was a technical problem with the results. Indian poverty rates are based on data from the National Sample Surveys (NSS), including the large and important 50th round of 1993–94 and 55th round of 1999–2000. Unfortunately, the expenditure modules of these two surveys are not strictly comparable, for three main reasons:

- The 1999–2000 survey distinguished 173 separate consumption items, which was somewhat fewer than the earlier survey. When there are fewer items, consumption tends to be understated.
- The 1999–2000 survey used a shorter recall period 7 rather than 30 days for high-frequency consumption items (such as rice and lentils).¹ This would tend to increase measured consumption.
- The 1999–2000 survey used a longer recall period a year instead of 30 days for a number of low-frequency items, such as clothing.

Deaton (2001) estimates that if there had been no change in the survey instrument, the official measure of poverty in 1999–2000 would have been 28 percent instead of the reported 26 percent. This represents a considerable degree of poverty reduction, but it is not as striking as the official numbers. And it is clear in retrospect that the results of the 1998 “thin” round of the National Sample Survey were incorrect (mainly because it collected data over a period of just half a year), as figure 16.2 (from Deaton 2002) shows.

Figure 16.2 Headcount Poverty Rates in India, 1970–2000



Source: Deaton 2002.

Note: The “thin” rounds refer to unofficial calculations based on small-scale household surveys, the central line shows the official results, and the lower line shows the calculations made by Deaton.

TOPIC 293: CAUTION 4. REMEMBER THAT PRICE INDEXES MATTER

- There is another important lesson from the Indian experience with measuring poverty: it is essential to use the right price indexes.
- Deaton (2001) shows that the official price indexes inflated the Indian poverty line too much between 1993–94 and 1999–2000, and this had the effect of understating the reduction in poverty.
- Moreover, the official price indexes overstate the price differential between rural and urban areas, greatly overstating urban poverty. Thus, poverty in India is lower than previously had been believed and is falling relatively quickly.

This shows up in the “fully adjusted headcount ratio” in figure 16.2.

Table 16.2 Price Indexes for Inflating Poverty Lines in India

	Budget shares in index		Laspeyres	Paasche	Fisher Ideal	Törnqvst	Official
	1993-94	1999-2000					
Panel A. Prices in 1999-2000 relative to those in 1993-94							
Rural	65.5	59.6	156.4	152.5	154.5	154.5	159.1
Urban	57.8	50.3	162.0	155.7	158.8	157.7	161.4
Panel B. Prices in urban areas relative to those in rural areas							
1993-94	65.8	73.7	117.5	113.7	115.6	115.6	136.7
1999-2000	53.2	61.1	115.9	114.0	115.0	115.1	138.6

Source: Deaton 2001.

- It is worth looking at Deaton's price calculations in more detail, because they both illustrate good practice and serve as templates for researchers who are trying to measure poverty.
- To recap, the problem to be tackled is adjusting a poverty line so that it reflects the same cost of living over time.
- In the Indian case, Deaton took as a given the national poverty line of Rp 115.70 per 30 days per person in 1987–88, but needed to find the equivalent poverty lines for 1993–94 and 1999–2000.
- Using data from the Indian NSS of 1993–94 and 1999–2000, Deaton constructed the price indexes that are set out in table 16.2. Panel A shows his estimates of price inflation between 1993–94 and 1999–2000 for rural and urban areas; he estimates that prices rose by about 4 percent less than shown by the official numbers.
- This implies a lower poverty line than the one used by the official measure, and hence a somewhat lower poverty rate.
- Table 16.2, panel B, shows Deaton's estimates of the cost of living in urban, relative to rural, areas. He finds that the urban cost of living is about 15 percent higher, a differential that is less than half of the 37 to 39 percent reported by the official statistics.

The implications of these price adjustments for the measured (headcount) poverty rate in India, both for the 1987–88 to 1993–94 periods and for the 1993–94 to 1999–2000 period, are shown in table 16.3. The rural poverty rate in 1987–88 is, essentially by construction, the same according to the official estimate and using Deaton's estimate, but Deaton's measure of urban poverty is far below the rate reported officially, and is far more plausible too. Between 1987–88 and 1993–94 the official numbers show a modest reduction in poverty, whereas Deaton finds a more substantial drop (because he uses a price index that inflates the poverty line by less than the official one).

- The official figures show a sharp drop in poverty between 1993–94 and 1999–2000. Deaton, using his price deflator, also finds a substantial drop (see the price-adjusted numbers in table 16.3), but he revises these upward somewhat to take into account the effect of changes in the questionnaire used. Deaton's preferred numbers, marked in boldface in table 16.3, show a relatively rapid fall in poverty between 1987–88 and 1999–2000, without any clear change in trend.

Table 16.3 Headcount Poverty Rates for India, Official and Adjusted

		1987–88	1993–94	1999–2000
Official	Rural	39.4	37.1	27.0
	Urban	39.1	33.2	23.5
Price-adjusted	Rural	39.0	32.9	21.6
	Urban	22.8	18.1	9.5
Price- and questionnaire-adjusted	Rural			25.3
	Urban			12.5

*Source: Deaton 2001.***TOPIC 294: CAUTION 5. USE CONSISTENT QUESTIONS**

When measuring changes in income or spending over time, it is important that the data come from surveys that used comparable questionnaires. The point is obvious enough, but it is worth emphasizing.

- The first example comes from Honduras, where a 2003 survey found a headcount poverty rate of 13.8 percent, based on income. Naturally, one wants to compare this with data from previous surveys. The relevant numbers are shown in table 16.4. Are we to conclude that, between 1999 and 2003, poverty fell sharply from 26.3 percent? Or did it rise substantially from 10.7 percent? Or can we not tell? The answer depends on whether the income module used in 2003 was the same as “income module 1” (see table 16.4) or “income module 2.” It turns out that the 2003 survey used “income module 2” and thus poverty appears to have risen. It would be easy to make the wrong comparison, however, and erroneously conclude that poverty had fallen sharply.
- Our second example comes from two surveys that were undertaken in Ethiopia in 1999–2000 (see table 16.5). According to the Welfare Monitoring Survey, undertaken in June–August 1999, expenditure per capita was relatively unequally distributed (a Gini coefficient of 0.49) and the headcount poverty rate rather high (at 81 percent). But the Household Income and Expenditure Survey (HIES), undertaken in January–February 2000, comes to a different conclusion, finding a remarkably even distribution of per capita expenditure (a Gini coefficient of 0.30) and a headcount poverty rate of just 22 percent.

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Table 16.4 Headcount Poverty Rates in Honduras, 1997, 1999, and 2003

	Income module 1	Income module 2	Which income module?
1997	24.1	12.0	
1999	26.3	10.7	
2003			13.8

Source: Shaohua Chen, personal communication.

Table 16.5 Income, Headcount Poverty, and Inequality, Ethiopia, 1999–2000

	Sample size	Mean expenditure per person (birr per month)	Headcount poverty index	Gini coefficient
Welfare Monitoring Survey (June–August 1999)	25,917	46.0	81.3	0.490
Household Income and Expenditure Survey (January–February 2000)	16,982	92.5	21.9	0.300

Sources: PovcalNet, at <http://surveynetwork.org/home?iv1=activities&iv2=catalog&iv3=surveys&ihsn=231-2000-001>; and Shaohua Chen, personal communication.



USING SURVEY DATA: SOME CAUTIONARY TALES-II

TOPIC 295: CAUTION 6. ADJUST FOR NONRESPONSE BIAS

In very poor countries, compliance rates for surveys are typically high. But as countries become more affluent, it becomes more difficult to persuade people to respond to lengthy questionnaires or to keep diaries. For example, fewer than one in four people respond to a telephone survey in the United States, which naturally brings into question the representativeness of the results of such surveys.

As long as noncompliance is random, then the survey results are still usable in measuring poverty, income, or expenditure. But it is generally believed that compliance is nonrandom. Richer people are less likely to respond to a questionnaire for a number of reasons:

- Their time is more valuable, so they don't want to spend three hours answering questions.
- They may have more to hide, from the tax collector, for instance, or from prying neighbors.
- They are more likely to have multiple earners in their household, so the information on income is likely to be less reliable, because most surveys only question a single household member about income.
- They are more likely to be away from home.

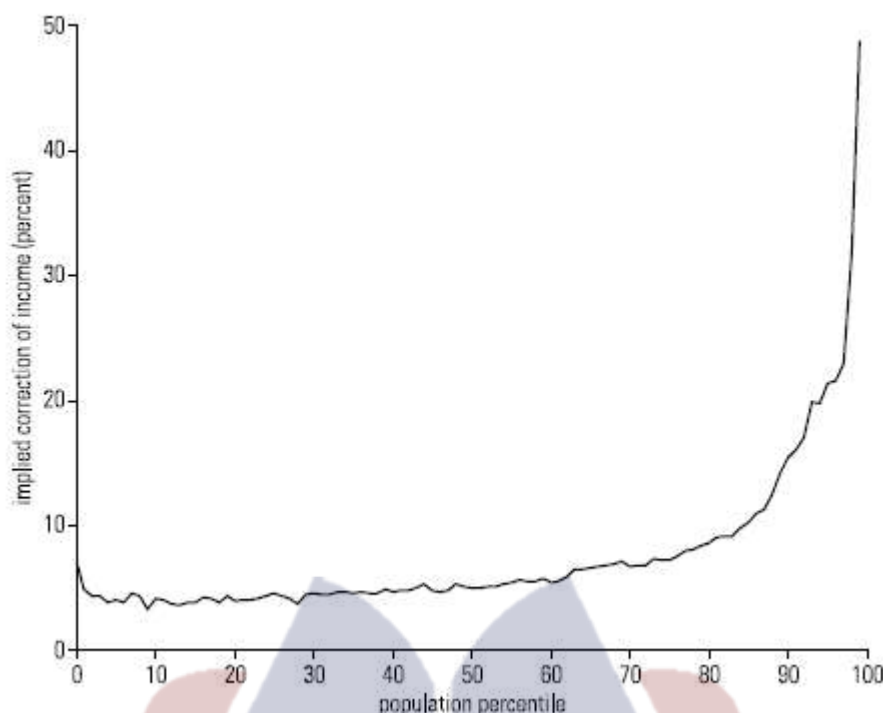
If compliance falls with income, then poverty is overestimated for all measures and poverty lines. It would be useful to be able to correct for noncompliance bias. Consider the basic example set out in table 16.6: a society has two groups of people, the poor (with a 90 percent response rate, constituting 81 percent of those surveyed) and the non-poor (50 percent response rate, 19 percent of these surveyed). Given these figures, we may infer that 70 percent of the population is poor ($= (.81/.9)/(.81/.9 + .19/.5)$) and 30 percent non-poor. Thus, we should weight each observation for the poor by 0.87 ($= .70/.81$) and each observation for the non-poor by 1.56 ($= .30/.19$). The main practical problem is estimating the response rate, because we do not now whether those who did not respond are rich or poor. An example of the implied correction to income that is needed to adjust for underreporting, for the United States, is shown in figure 16.3.

Table 16.6 Example of Correction for Nonresponse Bias

	"Poor"	"Nonpoor"
Estimated distribution (%)	81	19
But: Response rate (%)	90	50
So: True distribution of population	70	30
Memo: Correction factors	0.87	1.56

Source: Example generated by the authors.

Figure 16.3 Correction Factors for U.S. Income



TOPIC 296: CAUTION 7. DEFINE EXPENDITURE CONSISTENTLY

- When making poverty or inequality comparisons, across countries or over time, it is essential that the way in which expenditure (or income) is defined remains unchanged. Yet this is frequently not the case.
- Consider the information in table 16.7 for a number of countries in Eastern Europe and the former Soviet Union.
- The way in which the costs of durable goods and housing are treated varies sharply from one country to the next.
- It is simply not plausible that durable goods consumption represents 9.5 percent of expenditure in the Russian Federation but only 2.4 percent in neighboring Ukraine or 5.2 percent in Poland. And all of the figures on expenditure on rent appear to be too low perhaps the imputed costs of housing have not been included. Certainly, it stretches credulity to believe that rent constitutes just 0.3 percent of expenditures in Romania; even the 3.5 percent figure for neighboring Moldova seems modest.
- Faced with such faulty numbers, what is the analyst to do? Given enough time and resources, it might be possible to go back to the original data sets to recalculate expenditure for each country on a consistent basis, but rarely do researchers have such a luxury, and besides, this assumes that all of the questionnaires collected adequate information in the first place.

Table 16.7 Percentage of Reported Spending Devoted to Health, Durable Goods, and Rent, for Selected Eastern European and Former Soviet Union Countries, 2002–03

		Percent of consumption expenditure devoted to:		
	Survey year	Health	Durable goods	Rent
Armenia	2002	10.2	0.7	
Azerbaijan	2003	3.2	6.8	0.4
Belarus	2002	2.3	1.6	
Estonia	2003	3.6	6.4	1.1
Georgia	2003	5.3	1.2	0.3
Lithuania	2003	4.1	8.7	
Moldova	2003	5.5	5.1	3.5
Poland	2002	4.7	5.2	3.8
Romania	2003	3.0	1.6	0.3
Russian Federation	2002	2.1	9.5	0.7
Turkey	2002	2.4	7.8	3.3
Ukraine	2003	2.6	2.4	0.4

Source: Shaohua Chen, personal communication.

- One approach is to exclude the doubtful expenditure headings entirely.
- The results of this exercise are shown in table 16.8, where expenditures on health, education, and rent are left out of the measures of consumption.
- Since no adjustment is made to the poverty line the World Bank's old \$2 per day standard the reported poverty rates are now higher.
- In most cases, the Gini coefficient of inequality, which ranges from 0 for perfect equality to 1 for perfect inequality, falls, implying lower inequality.
- In passing, one might note that there are other oddities in the numbers shown in table 16.8: it is strange that the poverty rate in Belarus should be so much lower than in nearby Estonia or Lithuania, which are much richer; and the reported inequality in Azerbaijan is implausibly low.

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Table 16.8 Rates of Headcount Poverty and Inequality, with and without Spending on Health, Durable Goods, and Rent, for Selected Eastern European and Former Soviet Union Countries, 2002–03

	Survey year	Including health, durables, rent		Excluding health, durables, rent	
		Poverty rate (%)	Gini coefficient	Poverty rate (%)	Gini coefficient
Armenia	2002	31.1	0.338	33.8	0.292
Azerbaijan	2003	1.7	0.174	5.7	0.181
Belarus	2002	1.4	0.297	1.6	0.292
Estonia	2003	7.5	0.358	9.4	0.339
Georgia	2003	25.3	0.404	27.9	0.403
Lithuania	2003	7.8	0.360	8.7	0.332
Poland	2002	1.9	0.345	2.5	0.324
Romania	2003	12.9	0.311	13.8	0.299
Russian Federation	2002	12.1	0.399	13.6	0.364
Turkey	2002	20.1	0.434	22.7	0.400
Ukraine	2003	4.9	0.281	5.8	0.273

Source: Shaohua Chen, personal communication.

Note: Data use \$2 per day standard in 1993 prices.

TOPIC 297: CAUTION 8. VALUE OWN-FARM INCOME PROPERLY

- For poor people, a substantial fraction of income (and expenditure) comes from own-farm output. It is therefore important to measure the value of this output correctly if one is to get an accurate measure of poverty.
- This is not a trivial point, as the experience with the China Rural Household Survey of 1990 makes clear.
- The traditional method of imputing income from own-farm consumption used official prices, which by 1990 were far lower than market prices.
- Using the old method, the headcount poverty rate was 38 percent (see table 16.9), but when own-farm consumption was valued at market prices the headcount rate was just 30 percent—that is, 60 million fewer poor people than had originally been thought.

Table 16.9 Levels of Income, Inequality, and Poverty in Rural China, 1990

	Mean income (yuan per capita p.a.)	Gini coefficient	Headcount poverty rate (%)
Old method	630	0.315	38
New method	686	0.299	30

Source: China Rural Household Survey 1990.

Note: The old method values own-farm production at official prices, while the new method values it at market prices.

TOPIC 298: CAUTION 9. DISTINGUISH BETWEEN VALUES THAT ARE ZERO AND THOSE THAT ARE MISSING

- It is important to distinguish between values that are zero and those that are missing, and it is not generally appropriate to substitute zeros for missing values.
- For instance, if a questionnaire does not record someone's age, one cannot assume that their age is zero. The point might seem obvious, but it is sometimes overlooked. In a

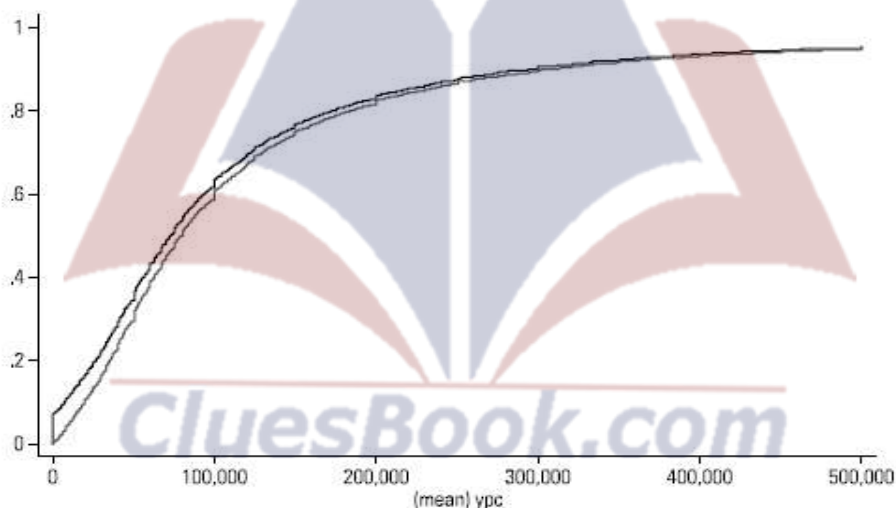
number of labor force surveys in Latin America and the Caribbean, zeros have been used when information on per capita income was missing.

- Figure 16.4 shows the cumulative distribution function of per capita income for Colombia for 2003, where 7 percent of the observations on income per capita were missing.
- When the missing values are included as zeros, one gets the upper curve, which understates the “true” distribution of income.
- However, the lower line constructed by excluding the cases with missing values is a reliable guide to the distribution of income in the population only if missing values are randomly distributed across those surveyed.

There are some occasions in which the use of zeros in the place of missing values may be justified, for instance, if a questionnaire asks the enumerator to fill in nonzero values (for example, for each item of consumption) and to skip an item if it is zero. In such cases, there would need to be a provision for a truly missing value, for instance, using a 99.

Sometimes it is possible to deal with missing values and outliers by going back to the original record to determine whether it is more reasonable to treat a value as zero or missing. This underscores the importance of keeping the original survey records and of putting in place a mechanism whereby the records may be consulted when questions arise about the accuracy of particular numbers.

Figure 16.4 Cumulative Distribution of Income per Capita, Colombia, 2003



Source: Shaohua Chen, personal communication.

Note: The top line shows the distribution when missing values are set to zero; the bottom line excludes observations with missing values.

TOPIC 299: CAUTION 10. USE EXPENDITURE PER CAPITA, NOT EXPENDITURE PER HOUSEHOLD

Most surveys collect information on income and expenditure on the basis of the household, rather than on individuals.

If we are interested in the distribution of welfare, or the poverty rate, we need to rank households by income (or expenditure) *per capita* and not per household.

What happens if the wrong measure is used? Not surprisingly, we may end up drawing the wrong conclusions.

This is illustrated in table 16.10, which first ranks individuals by per capita expenditure (correct), and then by per household expenditure (incorrect) based on the Benin Income/Expenditure/Household (IEH) survey of 2003. When ranked correctly, we see that more

affluent households tend to be smaller than poor households; but if we mistakenly rank households by income per household, then we are left with the (incorrect) impression that richer households are larger.

Table 16.10 Household Size by Expenditure per Capita and Expenditure per Household Deciles, Benin, 2003

Households ranked by expenditure per capita		Households ranked by expenditure per household	
Decile	Mean household size	Decile	Mean household size
1 (poor)	8.54	1 (poor)	2.68
2	7.72	2	3.56
3	7.84	3	4.19
4	7.16	4	4.61
5	6.90	5	4.83
6	6.57	6	5.11
7	6.52	7	5.55
8	5.78	8	5.69
9	5.42	9	6.25
10 (rich)	4.33	10 (rich)	6.99

Source: Benin IEH survey of 2003.

TOPIC 300: CAUTION 11. USE WEIGHTS WHEN THEY ARE NEEDED

Few living standards surveys are based on simple random samples; most use a stratified cluster sampling design. The implication, as discussed earlier, is that one must use weights when working with the data. The effects of ignoring weights can be striking: the simple average income of tax filers included in the U.S. Internal Revenue Service 1 percent Public Use Sample was \$501,814 in 2001—an enormous amount, which reflects the fact that the data set oversamples high-income individuals. When weights are used to adjust for the sample design, one finds an average income, based on the 138,954 observations, of \$26,840, which is entirely plausible.

