Global Poverty Measurement:
Current Practice and Future Challenges

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Outline

1. The World Bank's approach
2. Global poverty measures
3. Challenges ahead

    3.1 Household surveys

    3.2 Purchasing power parity conversions

    3.3 Relative poverty

   3.4 Multidimensional indices of poverty

1. The World Bank's global measures of income poverty

"Poor" by whose definition?

- In assessing poverty in a given country, and how best to reduce poverty, one naturally focuses on a poverty line that is considered appropriate for that country.
  - That is common practice in all national poverty assessments (incl. World Bank).
  - The vast bulk of the Bank's poverty measurement and analysis is at the country level, using country-specific poverty measures.

- But how do we talk meaningfully about "global income poverty"?
  - Poverty lines across countries vary in terms of their purchasing power,
  - and they have a strong <u>economic gradient</u>, such that richer countries tend to adopt higher standards of living in defining poverty =>

=> Absolute poverty dominates in poorest countries; relative poverty elsewhere
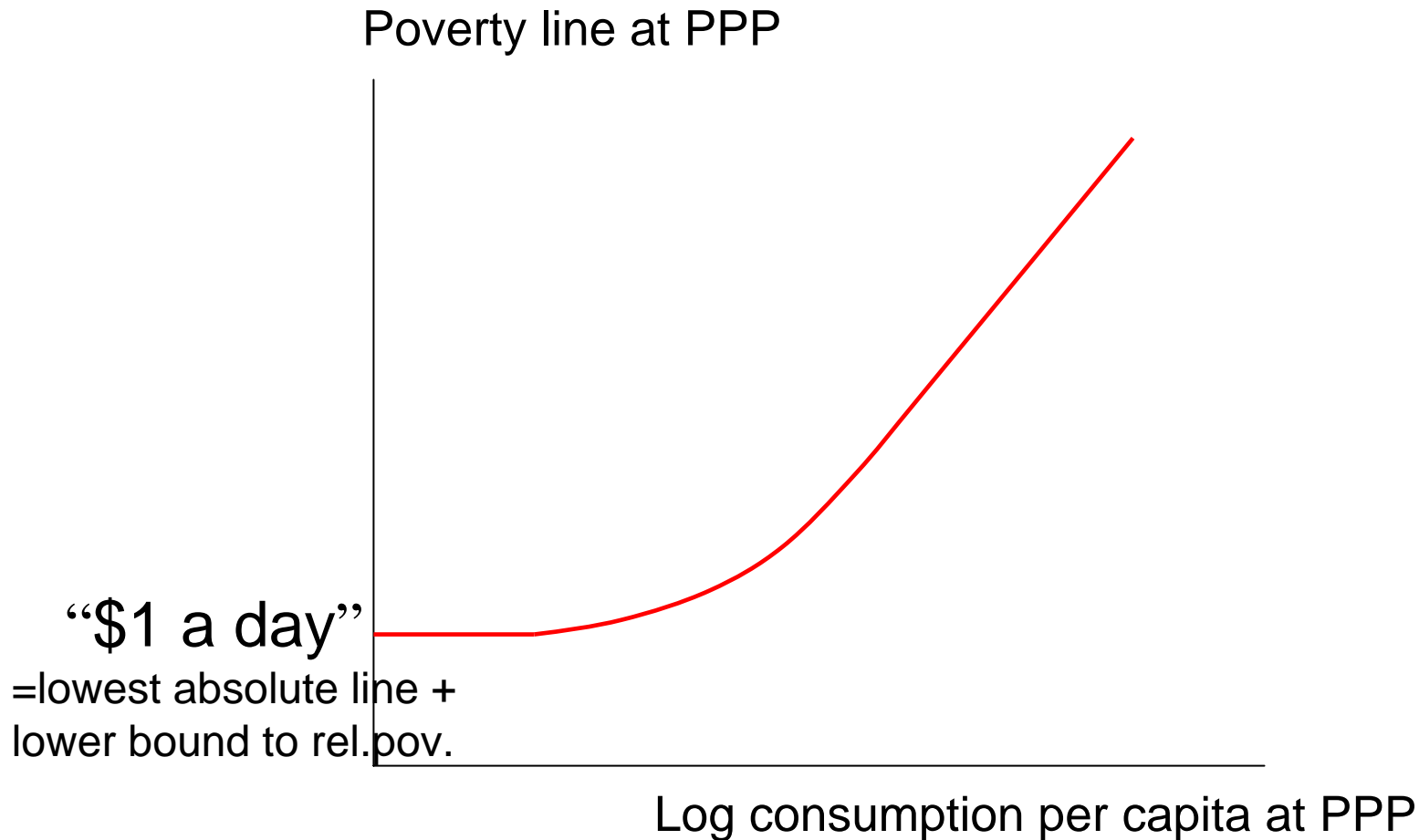

Poverty line at PPP
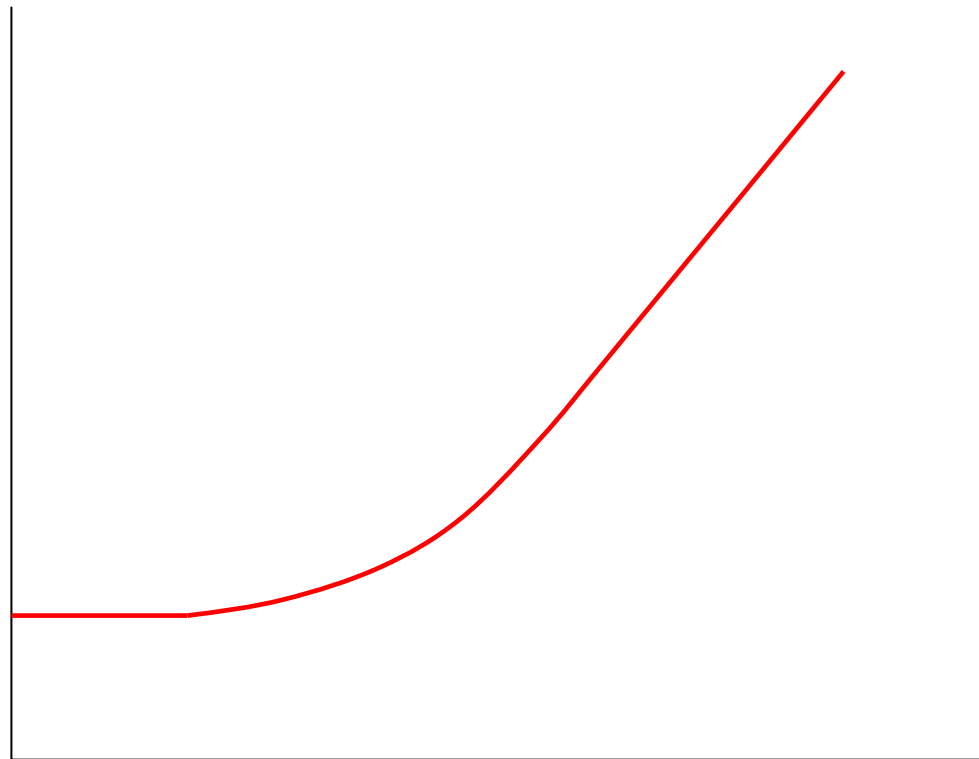
Log consumption per capita at PPP

The "$1 a day" global poverty measures

- To measure poverty in the world as a whole, the "$1 a day" measures apply a common standard, anchored to what "poverty" means in the world's poorest countries.

- Two people with the same purchasing power over commodities are treated the same way—both are either poor or not poor—even if they live in different countries.

- By focusing on the standards of the poorest countries, the $1 a day line gives the global poverty line a salience in focusing on the world's poorest that a higher line would not have.

=> Absolute poverty dominates in poorest countries; relative poverty elsewhere

Poverty line at PPP

"$1 a day"
=lowest absolute line +
lower bound to rel.pov.

Log consumption per capita at PPP

New compilation of national poverty lines

- New compilation of national poverty lines from the Bank's country-level Poverty Assessments/PRSPs.
  - Poverty lines considered appropriate to living standards in each country.
  - Food + non-food "basic needs"
  - Consultation with Government, or Government's own line.
- Converted to common currency using 2005 PPP for individual consumption
- Data set for 75 countries

National poverty lines for developing countries plotted against mean consumption using consumption PPPs for 2005
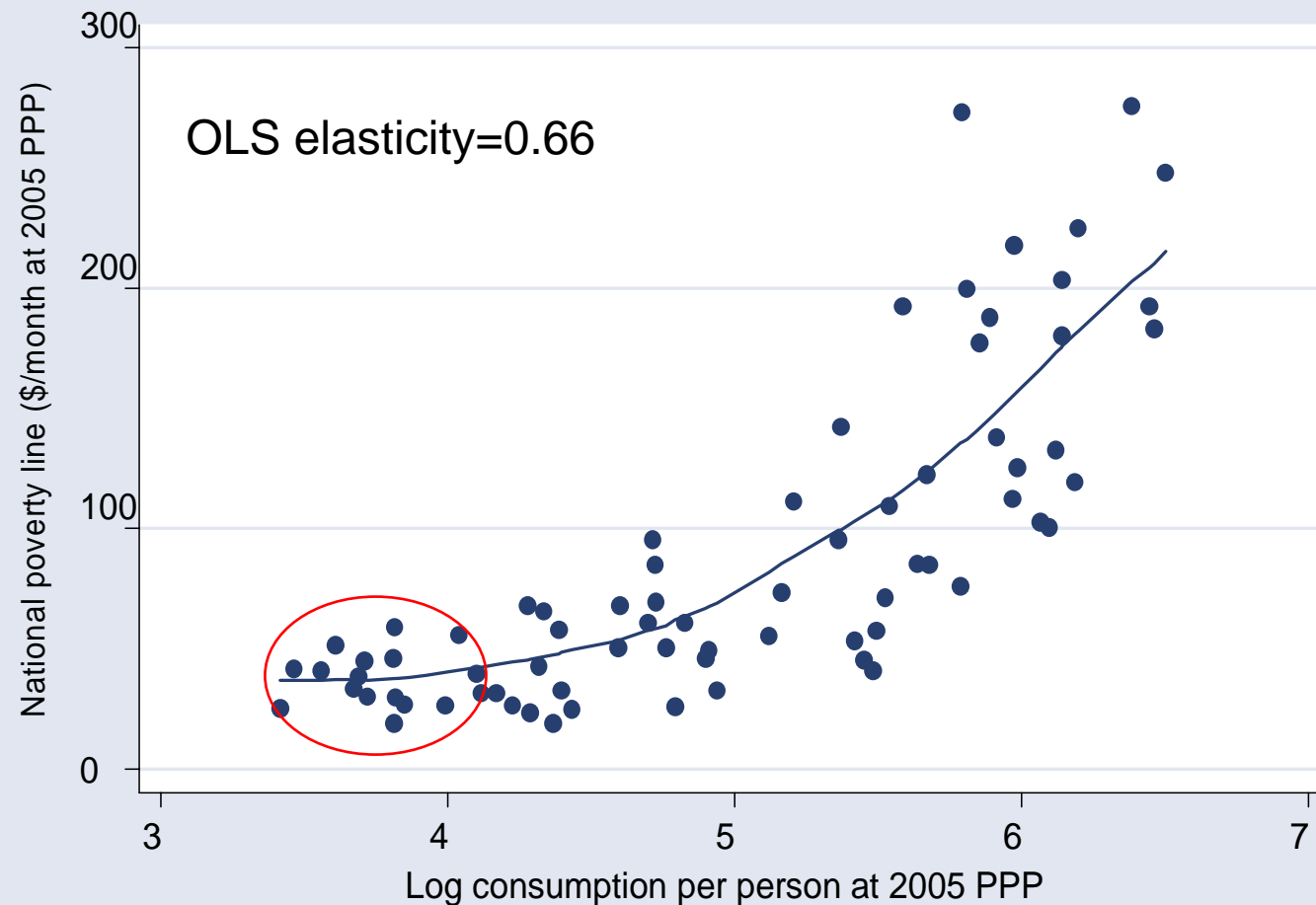
Note: Fitted values use a lowess smoother with bandwidth=0.8

Food and non-food components of the economic gradient in poverty lines

	Income elasticity of national poverty line
Food	0.47
Non-food	0.91
Total	0.66

- So the economic gradient in national poverty lines is driven more by the gradient in non-food needs, which accounts for 60% of the overall elasticity.

Alternative lines for testing robustness

- $1.00: India's official poverty line
- **$1.25**
- $1.45: 2005 value in the US of our old (1993) line of $1.08/day
- $2.00: Median of all developing/transition countries
- $2.50: Median of all <u>except</u> the poorest 15

Steps in measuring global poverty

Differences in data and methods between ICP benchmark years
=> PPP conversion is only done once
+ National data sources used for inter-temporal comparisons

- The international poverty line is converted to local currencies in the ICP benchmark year (2005)
- and is then converted to the prices prevailing at the time of the relevant household survey using the best available CPI for that country.
- Then the poverty rate is calculated from that survey.
- Interpolation/extrapolation methods are used to line up the survey-based estimates with these reference years, including 2005.

2. Global poverty measures

Progress for the poorest in the aggregate

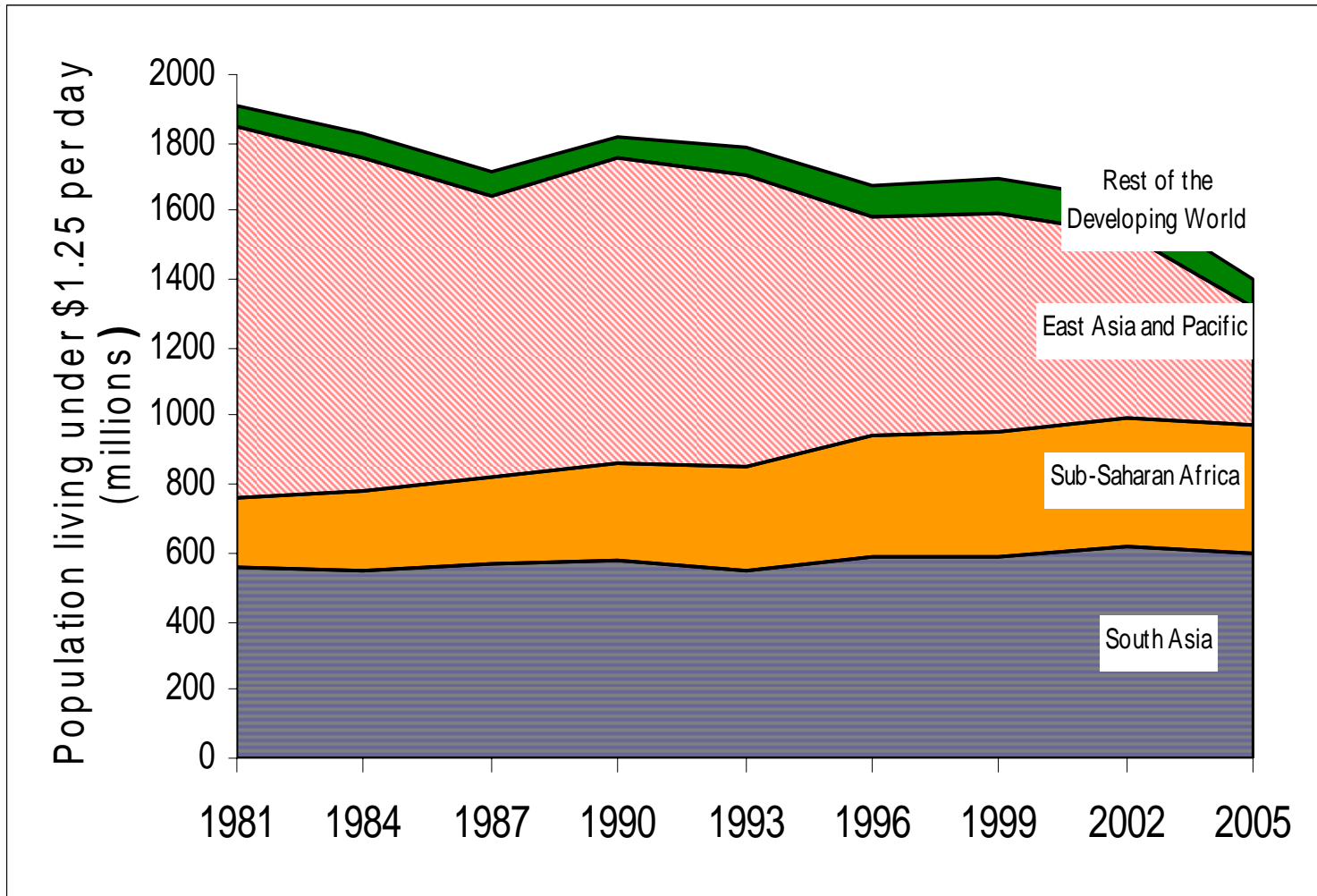The % below $1.25 a day was halved, falling from 52% to 26% over 1981-2005.

– Trend decline of one % point per year.

– At this rate, the developing world as a whole is on track for attaining the first MDG.

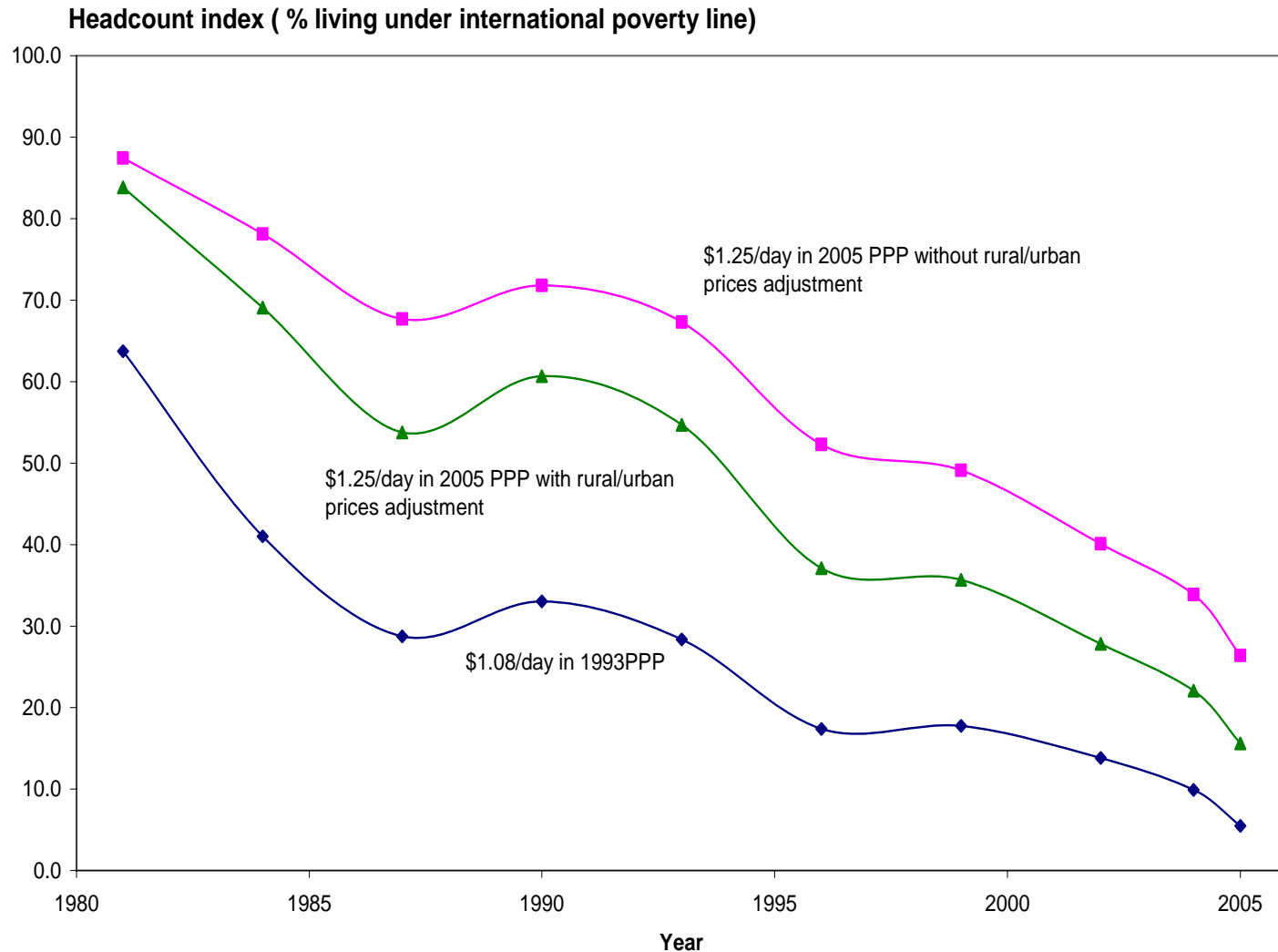Headcount index (% below poverty line)
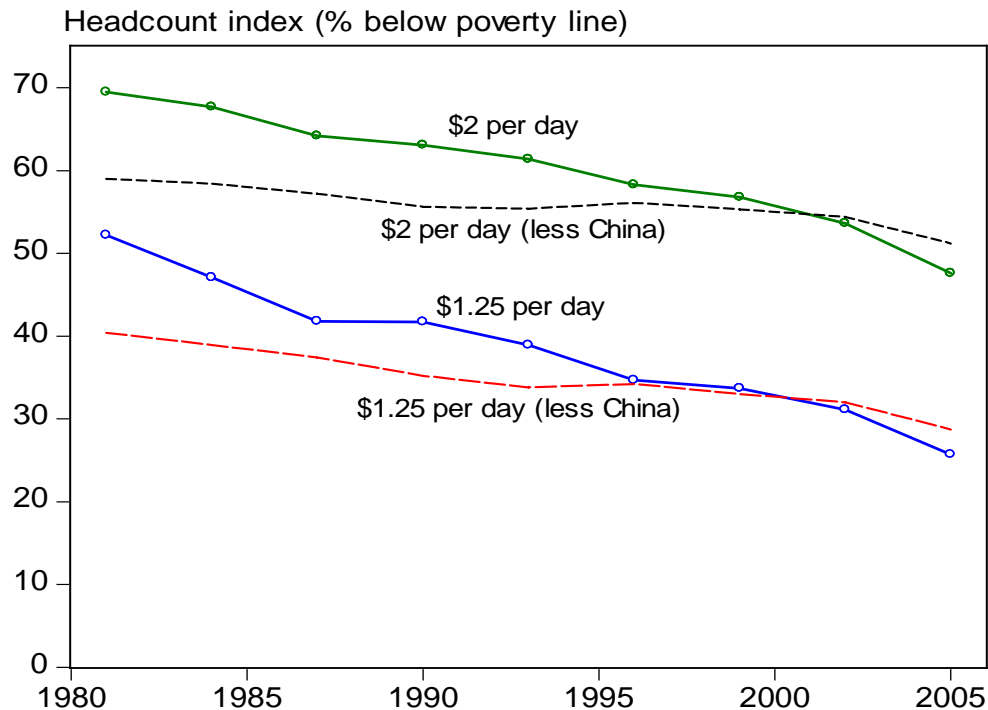
- Number of poor fell by 500 million, from 1.9 billion to 1.4 billion
- Poverty rate fell in all years
- Robust to choice of poverty line

The regional picture: uneven progress

Number of poor by region

Huge progress against poverty in China

Headcount index (% living under international poverty line)

$1.25/day in 2005 PPP without rural/urban prices adjustment

$1.25/day in 2005 PPP with rural/urban prices adjustment

$1.08/day in 1993PPP

Year

India too, but less so

Headcount index (% below poverty line)

New international line
($1.25/day 2005 PPP)

Old international line
($1.08 at 1993 prices using 1993 PPP)

$1.00/day 2005 prices and PPP
(close to India's official line for 2004/05)

Other regions

- In the developing world <u>outside</u> China, the $1.25 poverty rate has fallen from 40% to 29% over 1981-2005.

- This was not enough to bring down the total number of poor, which has stayed at around 1.2 billion.

- <u>South Asia</u>: The poverty rate has fallen from 60% to 40% between 1981 and 2005. But this has not been enough to bring down the number of poor.

- The poverty rate has fallen over 1981-2005 in <u>Latin America and the Caribbean</u>, and in the <u>Middle East and North Africa</u>, though not enough to bring down the number of poor.

- <u>Eastern Europe and Central Asia</u>: Rising incidence and number of poor, though signs of progress since late 1990s.

Sub-Saharan Africa stands out

- $1.25 a day poverty rate for Africa has shown no sustained downward trend over the whole period; starting and ending the period at 50%.
- The number of poor has almost doubled in Africa over 1981-2005, from 200 million to 380 million.
- Share of poor in SSA has risen from 11% to 27%.

- Greater <u>depth of poverty</u> in Africa. The mean consumption of the poor is lower than any region, at around 70 cents per day in 2005 (using the $1.25 line).
- Depth of poverty implies that even higher growth will be needed in Africa to bring its rate of poverty reduction into line with other regions.
- And it will be important that the growth does not come with rising inequality.

Past the turning point? Maybe

Poverty rates for Sub-Saharan Africa 1981-2005
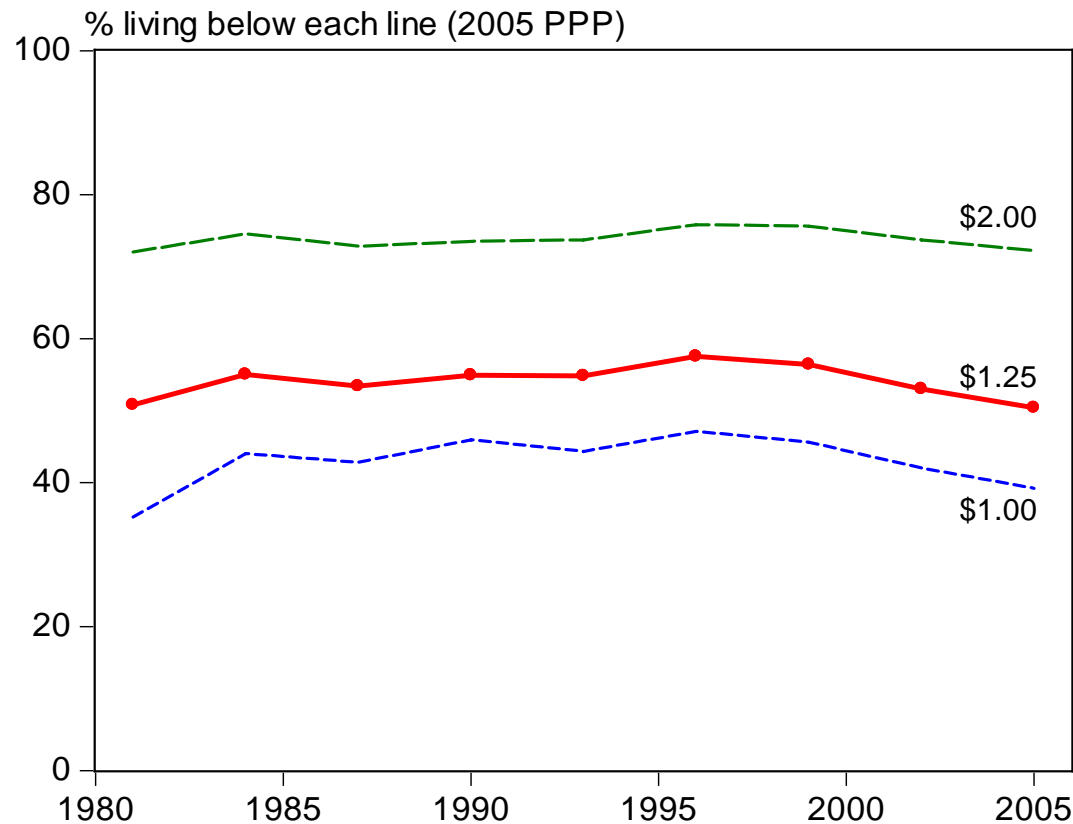
3. Challenges ahead

3.1 Household surveys

Huge expansion in survey coverage

- 22 countries in original "$1 a day" measures for 1990 WDR; one survey per country

- 116 countries today; 700+ surveys; 6 per country

- Latest surveys: Sample of 1.23 million households (5.5 million people)

- Consumption preferred to income

- Comprehensive consumption aggregate

- But not complete welfare metric (non-market goods, intra-household inequality)

Expansion in survey coverage

	Pop. covered by at least one survey in WDR 1990 (%)	Pop. covered by at least one survey in WDI 2008 (%)
East Asia	85	96
East Europe & Central Asia	21	98
Latin America	55	98
Middle East & North Africa	11	79
South Asia	95	98
Sub-Saharan Africa	6	92
Total	**65**	**95**

Improvements in coverage for all regions, but MENA still lagging.

Continuing concerns about surveys

- Lags in data availability and public access
- Comparability over time and across countries
  - Differences in questionnaire design and definitions (consumption or income aggregates)
- Under-reporting and selective compliance
  - But not valid to replace survey means by national accounts aggregates, holding inequality (Lorenz curve) constant
  - The problems are unlikely to be distribution neutral

3.2 Purchasing power parity currency conversions

Balassa-Samuelson and the "Penn Effect"

- International comparisons have long recognized that market exchange rates are deceptive given that many of the commodities that people consume are not internationally traded.

- Low real wages in developing countries entail that labor-intensive <u>non-traded</u> goods tend to be relatively cheap there (the "Balassa-Samuelson effect").

=>Market exchange rates, which tend to equate purchasing power in terms of <u>traded</u> goods, tend to understate real income in developing countries (the "Penn effect")

Concerns about quality of past PPP

PPPs are constructed from elaborate price surveys within countries done by the *International Comparisons Project* (ICP) (UN; now WB).

Huge improvements in data quality since 1970, but concerns remain:

- Incomplete ICP participation
- Differences in quality of goods
- Weak standards for price surveys

2005 ICP

- By far the best ICP round yet, esp., in standardizing product quality in price surveys. But problems remain:
  - "Urban bias" in price surveys
    - China: 11 cities; reasonably representative of urban areas but not rural
    - Similar problems for Argentina, Brazil, Bolivia, Cambodia, Chile, Colombia, Pakistan, Peru, Thailand and Uruguay.
  - Correction using urban/rural poverty line differentials.
  - India: ICP surveys under-represent rural areas
  - Implicit PPPs for urban and rural India (Rs 17 and Rs 11)
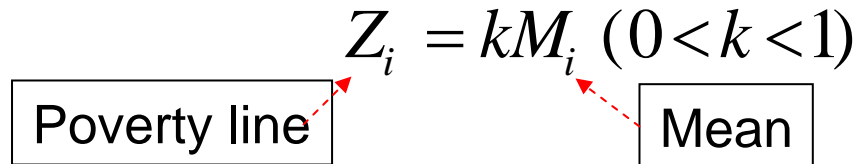
PPPs for the poor

- Above PPPs are for mean consumption
- Less of a problem in poor countries
- But how does it affect the gradient?
- Various PPPP's:
  - Food component of PPP (Reddy and Pogge); but why put zero weight on non-food?
  - Fisher, Tornqvist and CPD indicies re-weighted to accord with expenditure patterns at the poverty line (Deaton and Dupriez)
  - Deaton and Dupriez have re-weighted the PPPs for sub-sample of countries with the necessary data.
  - Our main results are robust.

3.3 Allowing for relative poverty

Strongly relative poverty lines

The more common practice in most OECD countries and Eurostat has been to set the poverty line as a constant proportion—typically 40-60%—of the (date and country-specific) mean or median income:

$$Z_i = kM_i \ (0 < k < 1)$$

Poverty line   Mean

We can call this a <u>strongly relative poverty line</u>

Arguments for strongly relative measures

1. <u>Welfarist justification</u> claims that people attach value to their income relative to the mean in a given society and that poverty lines should be interpreted as a <u>money metric of utility</u>. "Relative deprivation."

    However, strongly relative lines imply that people care <u>only</u> about relative income; no value on own income! This is implausible, except possibly in (very) rich countries.

2. <u>Non-welfarist</u> ("capabilities") justification: poverty lines should allow for differences in the <u>cost of social inclusion</u>,
    *   This can be defined as the expenditure needed to cover certain commodities assuring that a person can participate with dignity in customary social and economic activities.

It can be agreed that certain forms of consumption serve an important <u>social</u> role

- Famously, Adam Smith pointed to the social-inclusion role of a linen shirt in eighteenth century Europe:

  "..a creditable day-labourer would be ashamed to appear in public without a linen shirt, the want of which would be supposed to denote that disgraceful degree of poverty which, it is presumed, nobody can well fall into without extreme bad conduct."

- Anthropologists have often noted the social roles played by festivals, celebrations, communal feasts, clothing
  - Seemingly high expenditures on celebrations and festivals by very poor people in survey data for a number of countries (Rao, Banerjee-Duflo).
  - Clothing can also serve a social role; conspicuous "designer label," which he interpreted as status-seeking behavior.
  - Qat in Yemen *"refusing to take qat is tantamount to accepting ostracisation"* (Milanovic, 2008, p.684)

However, the social role of consumption does <u>not</u> imply strongly relative poverty lines

- The key assumption of strongly relative measures is that the <u>cost of inclusion is a constant proportion of mean income</u>.

- That is hardly plausible. The social-inclusion needs of very poor people may well be low, but it is difficult to see why they would go to zero in the limit.
  - Presumably a socially acceptable linen shirt would not have cost any less for the poorest person in eighteenth century Europe as for someone living at the poverty line.
  - Very poor people are highly constrained in spending on things that facilitate their social inclusion, but that does not mean that their inclusion needs are negligible.

The weak relativity axiom (WRA)

- **<u>Weak relativity axiom</u>:** *If all incomes increase (decrease) by the same proportion then the aggregate poverty measure must fall (rise).*

- In any standard (additive) poverty measure this will be satisfied as long as *the elasticity of the poverty line to mean income is less than unity*.

- Strongly relative measures do not satisfy WRA
  - Elasticity of *Z* w.r.t. *M* of unity.
  - If all incomes grow at the same rate (including for the poor) then measured poverty will not fall.

<u>Further reading</u>: Martin Ravallion and Shaohua Chen, "Weakly Relative Poverty", *Review of Economics and Statistics*, 2011.

Weakly vs. strongly relative lines

Poverty line

Weakly relative

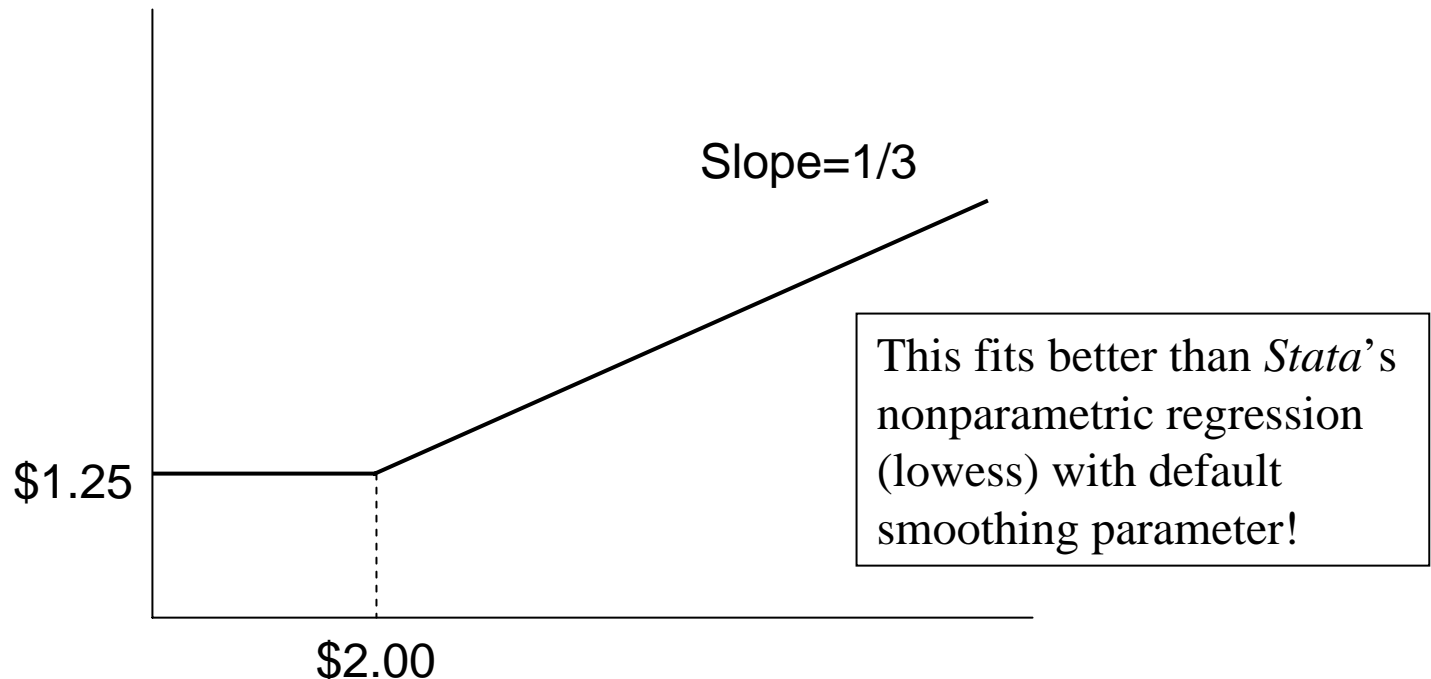Strongly relative
(Atkinson-Bourguignon)

Absolute line

Mean
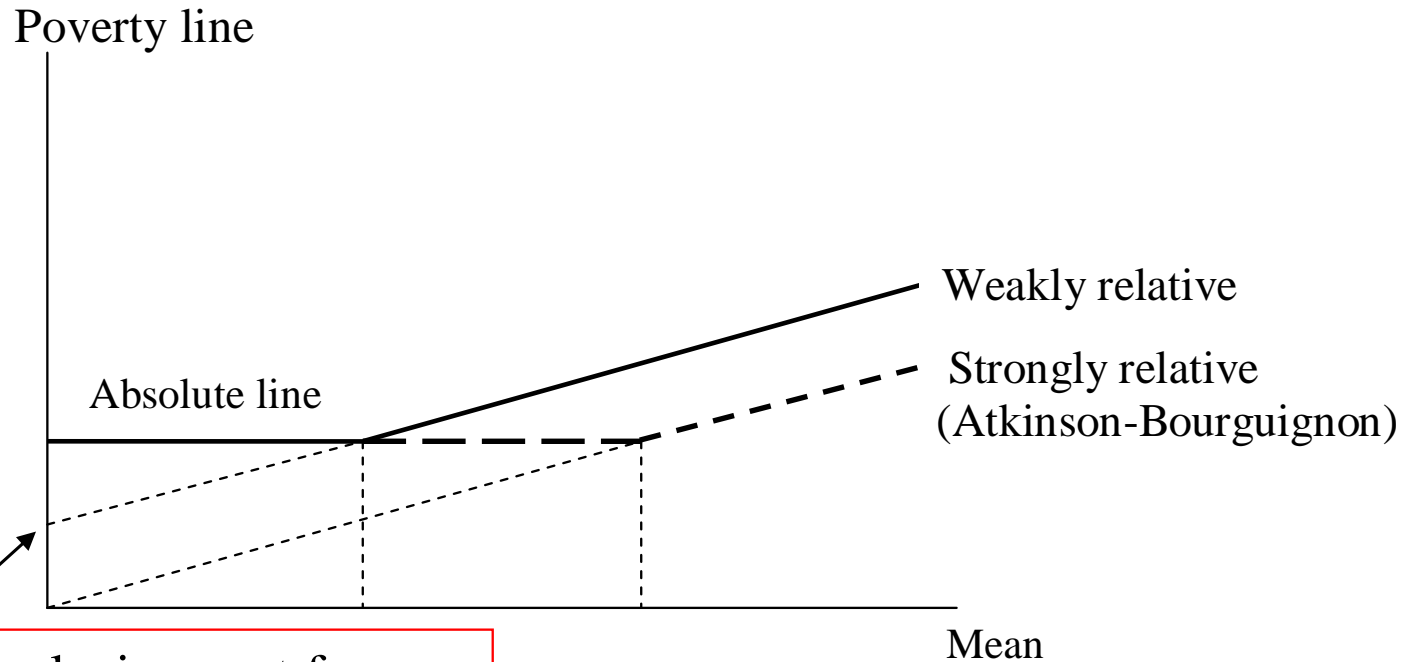
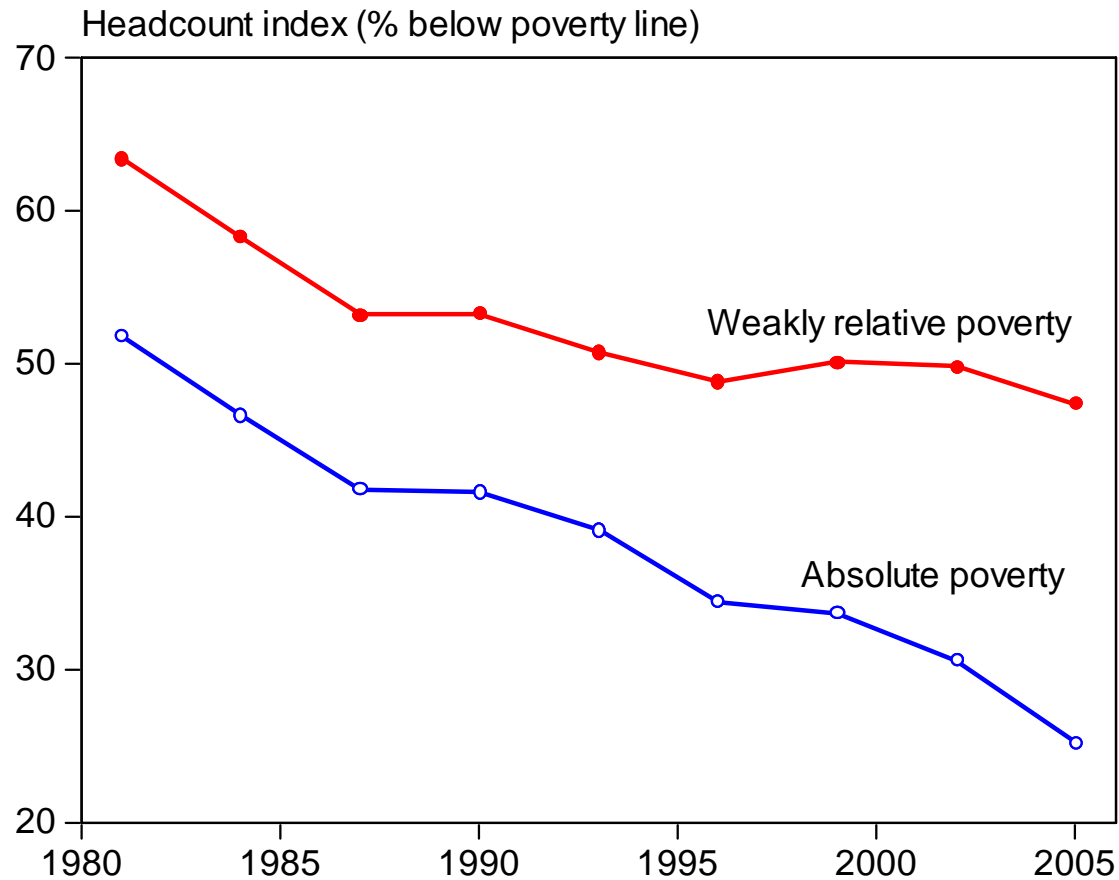Social inclusion cost for poorest; e.g., Adam Smith's linen shirt, which costs just as much for the poorest.

Proposed new relative poverty lines

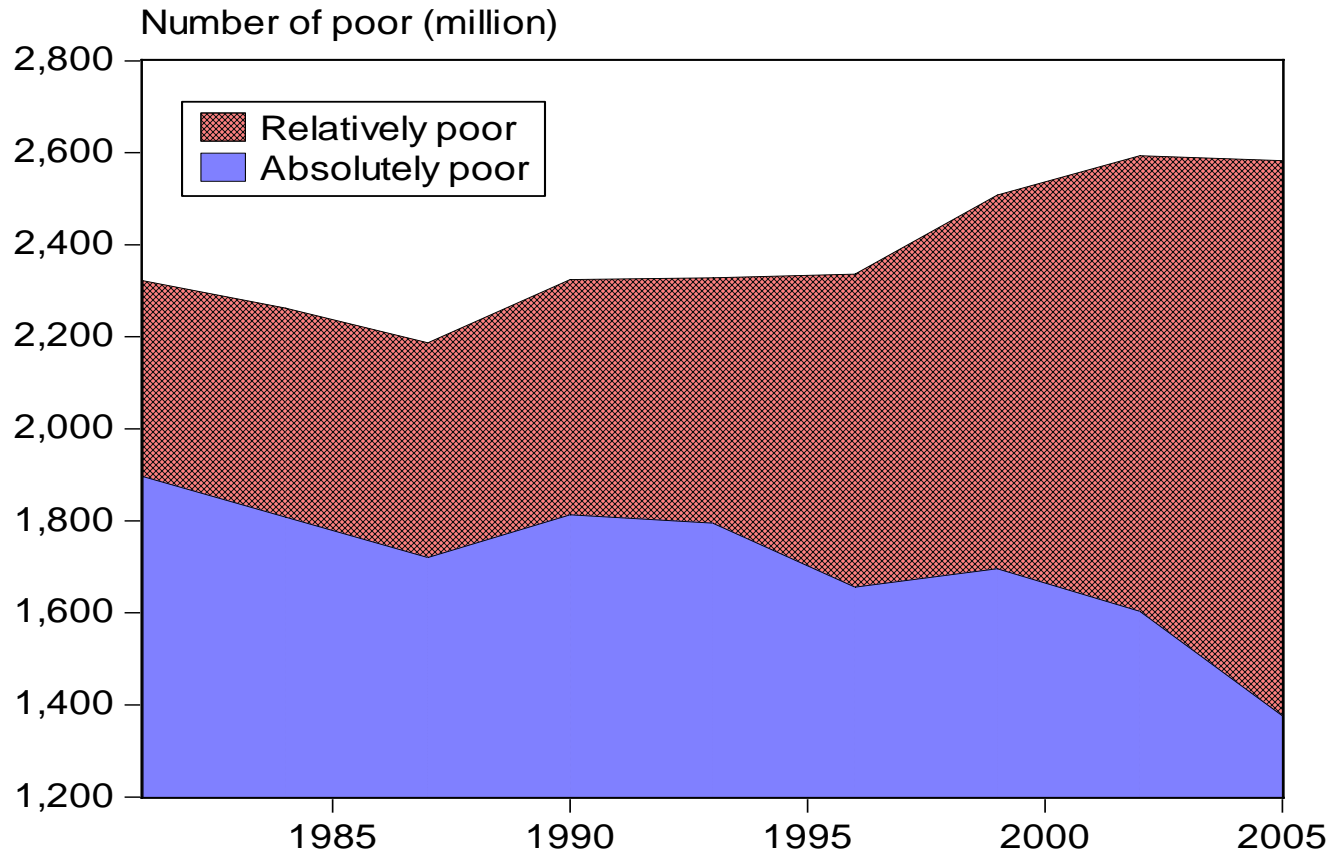- Lower bound of $1.25 a day; rising with gradient 1:3

$$Z_i^R \equiv \max[\$1.25, \$0.60 + C_i / 3] = \$0.60 + \max[\$0.65, C_i / 3]$$

Slope=1/3

$1.25

$2.00

This fits better than *Stata*'s nonparametric regression (lowess) with default smoothing parameter!

Absolute and relative poverty in the developing world

Numbers of absolutely poor and relatively poor

3.4 "Multidimensional Indices of Poverty"

What is the difference?

- Almost every poverty measure found in practice is "multidimensional."

- And it is agreed that a standard poverty measure is incomplete, esp., non-market goods relevant to welfare, such as access to public services.

- The difference lies in:

  (i) whether one believes that credible poverty assessments and policy recommendations can ever be based on a single index; and

  (ii) the space one chooses to aggregate across multiple dimensions, namely whether that is the "attainment space" or "deprivation space."

Could a single index ever be credible?

- In a mashup index neither the menu of the primary series nor their aggregation is pre-determined from theory and practice, but are "moving parts" of the index—key decision variables that the analyst is free to choose.

- However, for most purposes of poverty measurement we do not need to form a single composite index.

- The actionable things are not typically found in the composite index but in its components.

- Then the obvious first step when given a mashup index is to un-pack it.

- Thankfully, many of the mashup indices found in practice can be readily un-packed, though it remains unclear what policy purpose was served by adding them up in the first place.

Some situations in which you do not want to pay attention to a mashup index

- You go for your annual medical checkup. Your doctor does all the usual tests, but tells you that she will base her assessment on a single composite index. Get a new doctor!

- A new car comes on the market that collapses all those dials on the dashboard into just one composite index, on which you are decide if you are going too fast or need fuel. Do not buy this car!

Why might we want to measure "hunger" separately to poverty?

- Aggregate household food consumption is already included in standard poverty measures.

- Commonly used poverty lines are anchored to nutritional requirements for good health and normal activities.

- However, there is an important dimension missing: intra-household allocation.

- Child (and adult?) nutritional status should be measured separately to poverty.

The "multiple index" challenge

- We are asking too much of a single measure of "poverty" to have it include things like child mortality, schooling, violence or empowerment, as components, on top of material living standards.

- We need to focus our efforts and resources on developing the best possible distinct measures of the various dimensions of poverty deemed relevant to a given setting

=> **Aiming for a credible set of "multiple indices" rather than a single "multidimensional index."**