Global Poverty Estimates: Present and Future

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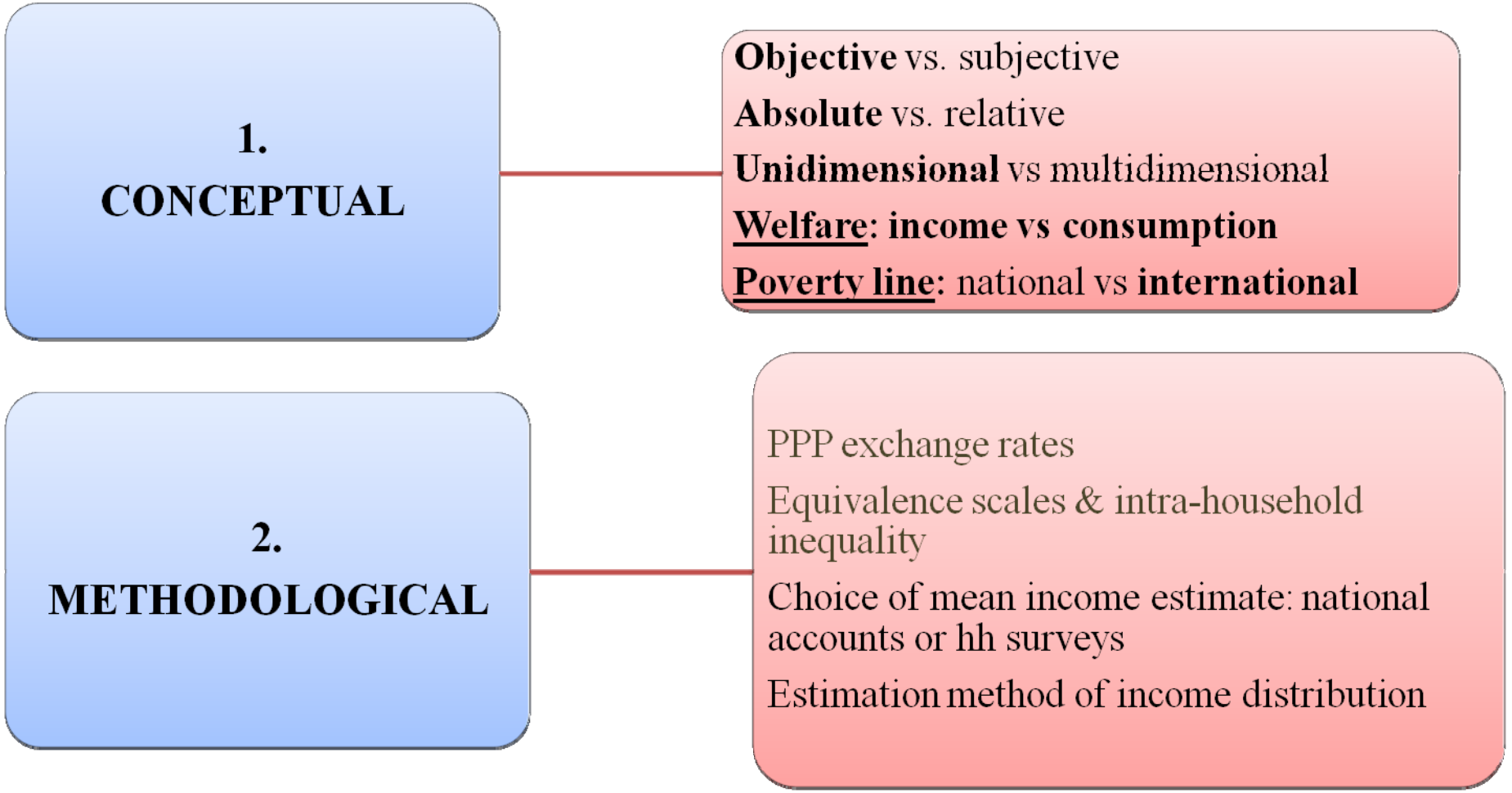
Outline

- Global poverty estimation—the standard approach
- Global poverty assessments:
    - A chronology of studies
    - What do current estimates tell us?
- Sensitivity analysis
    - Survey vs. national accounts-based mean incomes
    - Estimation methods
- Conclusions

Standard approach



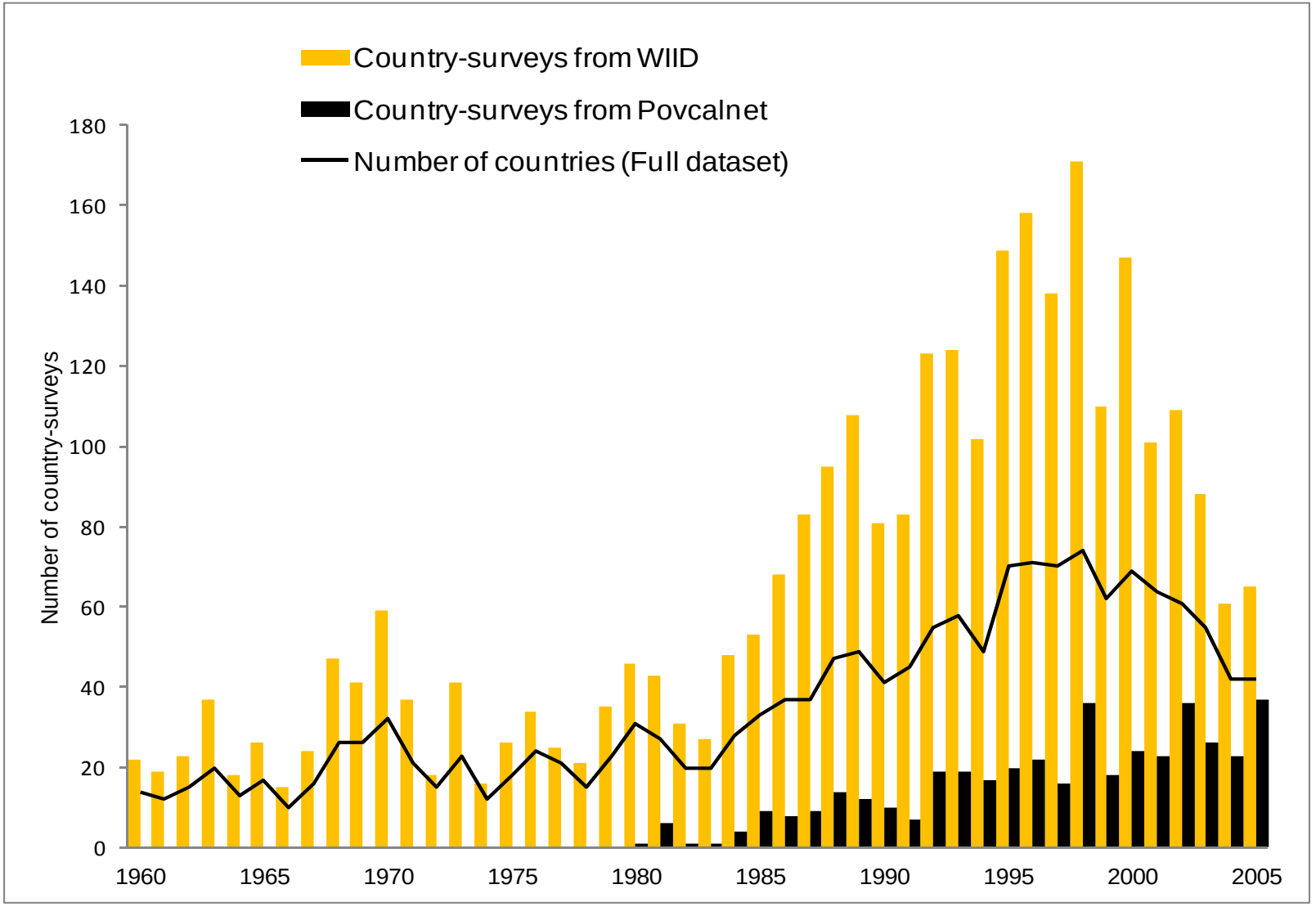
Global poverty assessments: a chronology of studies

- Compilations of cross-country distributional data:
  - Paukert (1973); World Bank—late 1970s
  - WDR 1979—20 countries
- First study:
  - Ravallion, Datt and van de Walle (1991)—22+64* countries
  - Chen and Ravallion (2001)—83 countries
- Latest study:
  - Chen and Ravallion (2008)—115 countries (675 hh surveys)

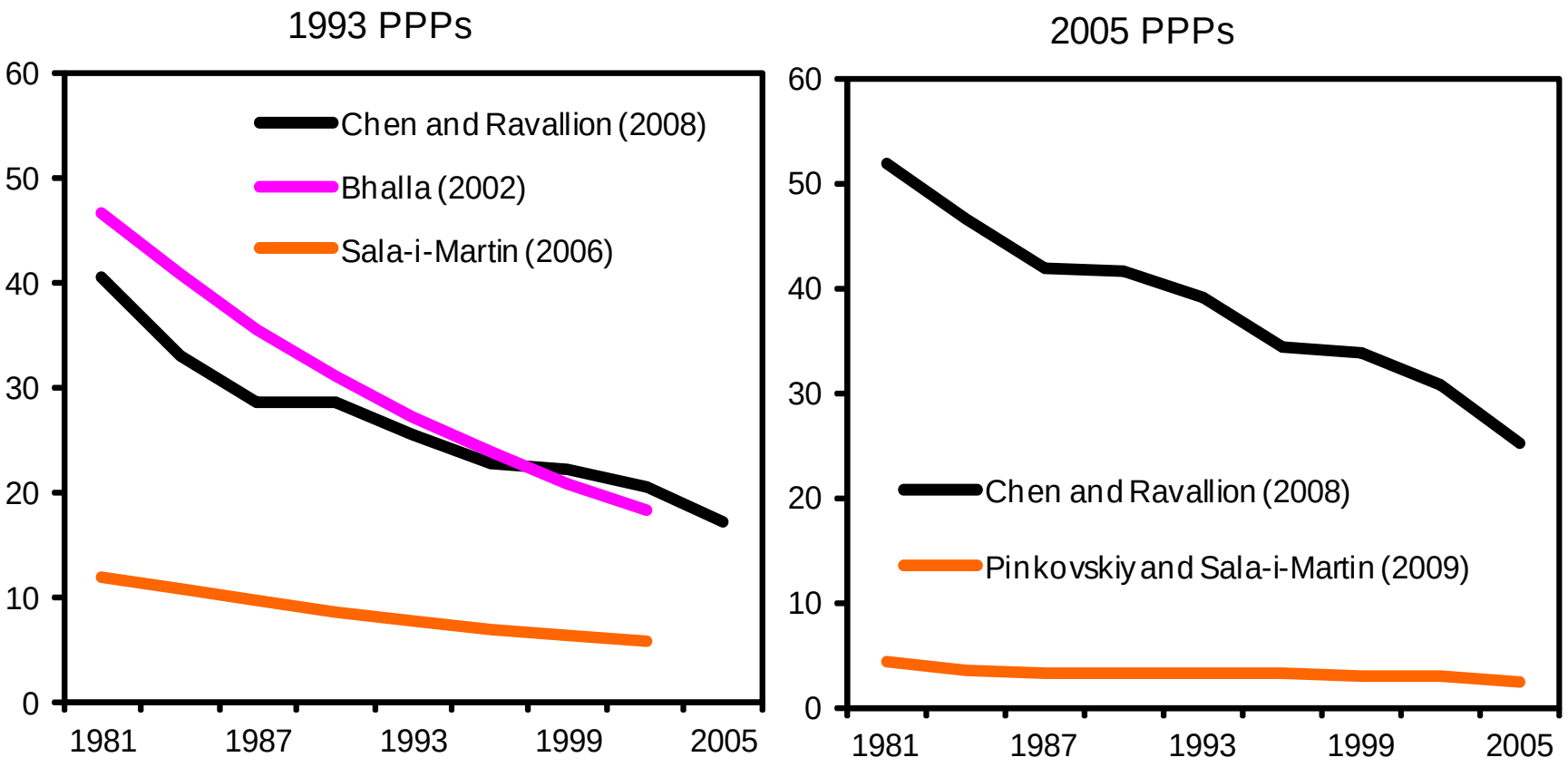
Global poverty assessments: a chronology of studies

	# of countries	% of developing world population	# of surveys	Poverty estimates are reported in:
Grouped data and individual records				
Ahluwalia, Carter, and Chenery (1979)	36[1/]			1975
Ravallion, Datt, and van de Walle (1991)	22[2/]			1985
Chen, Datt, and Ravallion (1994)	40			1985, 1990
Ravallion and Chen (1997)	67	85%	109	1987, 1990, 93
Ravallion and Chen (2001)	83	88%	265	1987, 1990, 93, 96, 98
Ravallion and Chen (2004)	97	93%	454	1981, 84, 87, 1990, 93, 96, 99, 2001
Ravallion and Chen (2007)	100	93%	500	1981, 84, 87, 1990, 93, 96, 99, 2002, 04
Ravallion and Chen (2008)	115	90%[3/]	675	1981, 84, 87, 1990, 93, 96, 99, 2002, 05
Grouped data				
Dowrick and Akmal (2001)	47	70%		1980, 1993
Bourguignon and Morrisson (2002)	33			1850, 1970, 1890, 1910, 29, 59, 60, 70, 80, 92
Sala-i-Martin (2002a, 2002b)	97+28[4/]	90%		1970, 1980, 1990, 1998
Sala-i-Martin (2004)	111+28[4/]	93%		1970, 75, 1980, 85, 1990, 95, 2000
Sala-i-Martin (2006)	110+28[4/]	93%		1970-2000
Pinkovskiy and Sala-i-Martin (2009)	191	98%	1069	1970-2006
Individual records				
Milanovic (2002)	91, 119	86%, 91%	216	1988, 1993

Global poverty assessments: The data available today



Current estimates: A comparative view



Notes: The various estimates are not strictly comparable because of differences in methodologies (see text). Furthermore, Chen and Ravallion (2008) and Bhalla (2002) compute the $1/day poverty rates relative to the developing world population, whereas Sala-i-Martin uses the total world population as denominator. The figures are for the year listed or the closest available year.

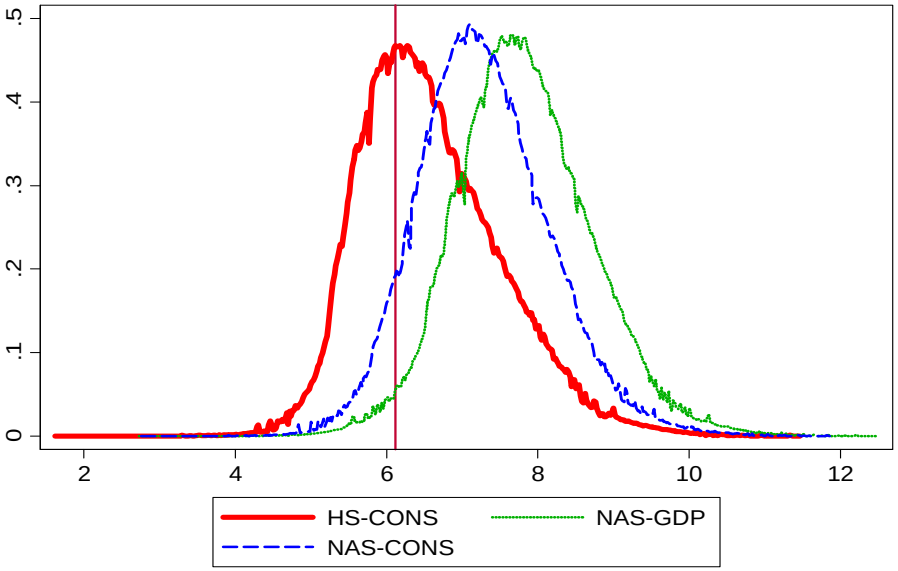
Current estimates: A comparative view

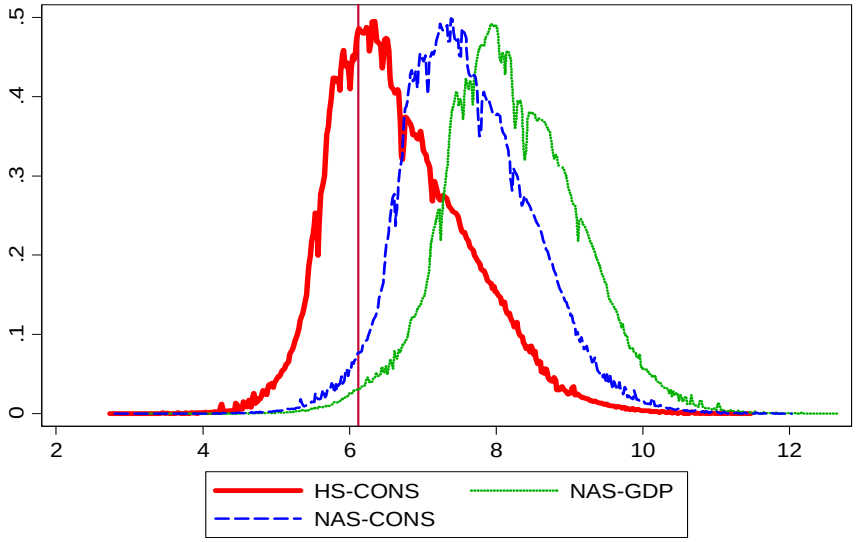
Characteristics of the analysis	Chen and Ravallion (2008)	Pinkovskiy and Sala-i-Martin (2009)
Scope of analysis	Developing world	World
Number of countries	115	191
% of (developing) world population	90	97.9
Number of surveys	675	1069
Type of data	Individual records, grouped data	Grouped data
Interpolation/extrapolation techniques	Yes, to line up surveys with reference years	Yes, of Gini coefficients for missing years
Welfare indicator	Consumption	Income
Source of data for welfare indicator	HS; when HS unavailable, use NAS with adjustment	NAS
International poverty line	$1.25/day (at 2005 PPP)	$1/day to $10/day (at 2005 PPP)
Estimation method	Generalized Quadratic (or Beta) for the Lorenz curve	Log-normal assumption for the density

Sensitivity analysis:
1st parameter

- The estimate of mean income to anchor relative (within-country) distributions
  - National accounts (NAS)
  - Hh surveys (HS)

Impact of NAS vs HS mean income choice on the world income distribution





Notes: The world income distribution has been obtained by integrating national distributions estimated assuming zero within-quintile inequality; and smoothed using a kernel density estimator with Gaussian kernel and optimal bandwidth (Silverman, 1986). The vertical line is placed at $1/day int'l poverty line.

Impact of NAS vs HS mean income choice on global poverty

	1995			2005			Reduction over 1995-2005		
	HS-CONS	NAS-CONS	NAS-GDP	HS-CONS	NAS-CONS	NAS-GDP	HS-CONS	NAS-CONS	NAS-GDP
Headcount ratio (%)								(%)	
$1.00/day	29.0	5.9	1.4	24.3	1.7	0.9	-16	-32	-72
$1.25/day	38.6	10.7	2.7	33.7	2.9	1.5	-13	-44	-73
$1.45/day	45.1	14.8	4.2	40.2	5.0	2.0	-11	-53	-66
$2.00/day	58.5	25.8	9.6	54.2	13.5	3.7	-7	-62	-47
$2.50/day	66.6	35.1	15.6	62.8	21.4	5.5	-6	-65	-39
Absolute headcount (millions)								(millions)	
$1.00/day	1,219	250	58	1,140	78	44	-6	-24	-69
$1.25/day	1,621	452	112	1,579	136	70	-3	-37	-70
$1.45/day	1,893	620	177	1,887	234	93	0	-48	-62
$2.00/day	2,458	1,082	405	2,540	635	174	3	-57	-41
$2.50/day	2,798	1,476	654	2,945	1,002	259	5	-60	-32

Source: Authors' calculations using the Generalized Quadratic parameterization of the Lorenz curve (Vilasenor and Arnold, 1989; Datt, 1998). Estimates obtained using the Stata package DASP Version 2.1 (Abdelkrim and Duclos, 2007).

Sensitivity analysis:
2nd parameter

- Estimation method of income distibution from tabulated data
  - Parametric:
    - Lorenz curve interpolation
    - Density estimation using functional form
  - Non-parametric:
    - Density estimation not using functional form

Impact of estimation method on global poverty (% poor)

	1995			2005			Reduction over 1995-2005		
	$1.00/day	$1.45/day	$2.50/day	$1.00/day	$1.45/day	$2.50/day	$1.00/day	$1.45/day	$2.50/day
	Headcount ratio (%)						(%)		
Parametric methods									
GQ	5.9	14.8	35.1	1.7	5.0	21.4	-72	-66	-39
Beta	4.2	11.0	29.9	1.3	3.3	17.6	-70	-70	-41
Beta*	4.4	11.1	30.3	1.3	3.7	17.0	-70	-67	-44
Log-normal	5.3	11.8	29.7	2.3	5.7	17.6	-57	-52	-41
Log-normal*	4.3	11.0	30.3	1.6	4.2	16.9	-62	-62	-44
Singh-Maddala	5.5	12.3	34.0	2.3	5.6	20.6	-58	-55	-39
Nonparametric methods									
Kernel *Silverman*	5.4	12.5	31.4	1.6	5.2	19.0	-69	-58	-40
Kernel *Normalscale*	6.0	13.1	31.7	2.0	5.7	19.2	-67	-56	-39
Kernel *Oversmooth*	8.9	16.6	32.9	4.1	9.2	22.7	-55	-45	-31
Kernel *DPI-1*	7.6	14.9	32.2	2.8	7.2	20.6	-64	-52	-36
Kernel *DPI-2*	8.1	15.6	32.2	3.2	7.7	21.5	-60	-51	-33
Kernel *DPI-3*	8.6	15.7	32.2	3.4	7.9	21.6	-61	-49	-33

Impact of estimation method on global poverty (# poor)

	1995			2005			Reduction over 1995-2005		
	$1.00/day	$1.45/day	$2.50/day	$1.00/day	$1.45/day	$2.50/day	$1.00/day	$1.45/day	$2.50/day
	Absolute headcount (millions)						(millions)		
Parametric methods									
GQ	250	620	1,476	78	234	1,002	-171	-385	-474
Beta	176	461	1,257	59	156	827	-116	-304	-430
Beta*	183	468	1,273	62	174	796	-121	-294	-477
Log-normal	225	497	1,247	108	268	827	-116	-229	-420
Log-normal*	179	462	1,273	76	197	793	-103	-265	-480
Singh-Maddala	232	518	1,430	109	263	966	-123	-256	-464
Nonparametric methods									
Kernel *Silverman*	226	527	1,321	77	244	891	-149	-282	-430
Kernel *Normalscale*	254	551	1,332	95	269	901	-159	-282	-431
Kernel *Oversmooth*	375	697	1,381	190	429	1,066	-185	-268	-315
Kernel *DPI-1*	318	625	1,351	129	335	967	-189	-290	-384
Kernel *DPI-2*	340	655	1,355	150	361	1,008	-190	-294	-347
Kernel *DPI-3*	362	658	1,354	157	372	1,012	-205	-286	-342

Impact of estimation method on global poverty (summary table)

	1995			2005			Reduction over 1995-2005		
	$1.00/day	$1.45/day	$2.50/day	$1.00/day	$1.45/day	$2.50/day	$1.00/day	$1.45/day	$2.50/day
	Headcount ratio								
Ratio between maximum and minimum estimate	2.1	1.5	1.2	3.2	2.7	1.3	0.8	0.6	0.7
Difference between max and min estimate (percentage points)	5	6	5	3	6	6	17	25	13
	Absolute headcount								
Ratio between maximum and minimum estimate	2.1	1.5	1.2	3.2	2.7	1.3	0.5	0.6	0.7
Difference between max and min estimate (millions)	200	237	229	131	273	272	102	157	165

Conclusions

- Much remains to be done…
  - Improvements in data collection practices across countries
  - Availability of unit-record data in large-scale databases
  - Using multidimensional frameworks and subjective data
  - As world grows richer, abandon absolute poverty framework in favor of a relative perspective

Objective vs. subjective

Absolute vs. relative

Unidimensional vs multidimensional

Welfare: income vs consumption

Poverty line: national vs **international**

PPP exchange rates

Equivalence scales & intra-household inequality

Choice of mean income estimate: national accounts or hh surveys

Estimation method of income distribution