

Session I: International poverty and inequality comparisons

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1 / 65

Preliminaries

What we'll talk about:

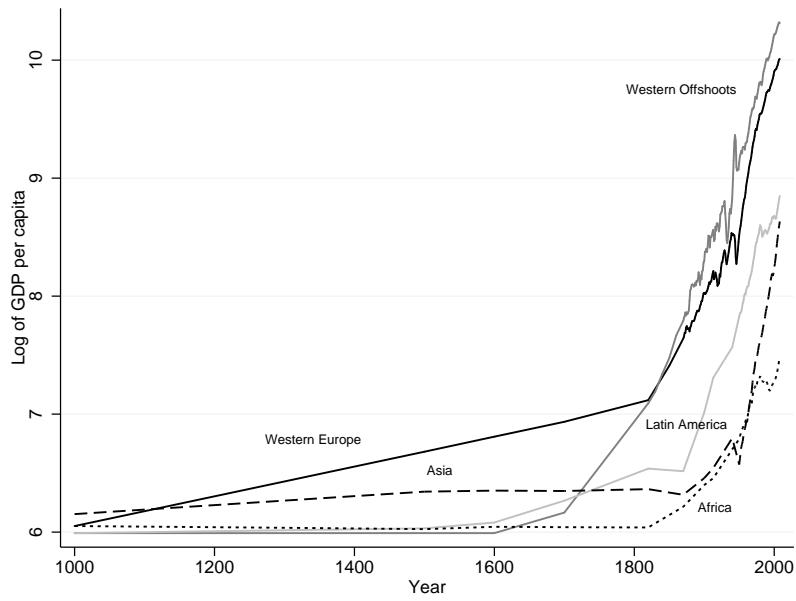
- ▶ Session 1: International poverty and inequality comparisons
- ▶ Session 2: Poverty accounting
- ▶ Session 3: Economic theories of inequality

Key Readings:

1. Bluhm, R., D. de Crombrugghe and A. Fosu (2016) EU Report
2. Kraay, A. (2006) *JDE*
3. Engerman, S. L. and K. L. Sokoloff (2002) *Economia*

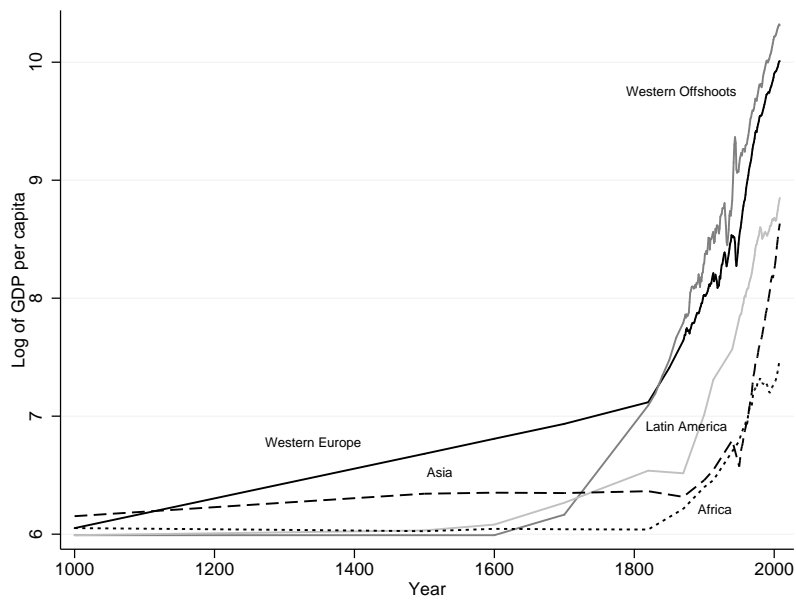
2 / 65

The Social Challenge



3 / 65

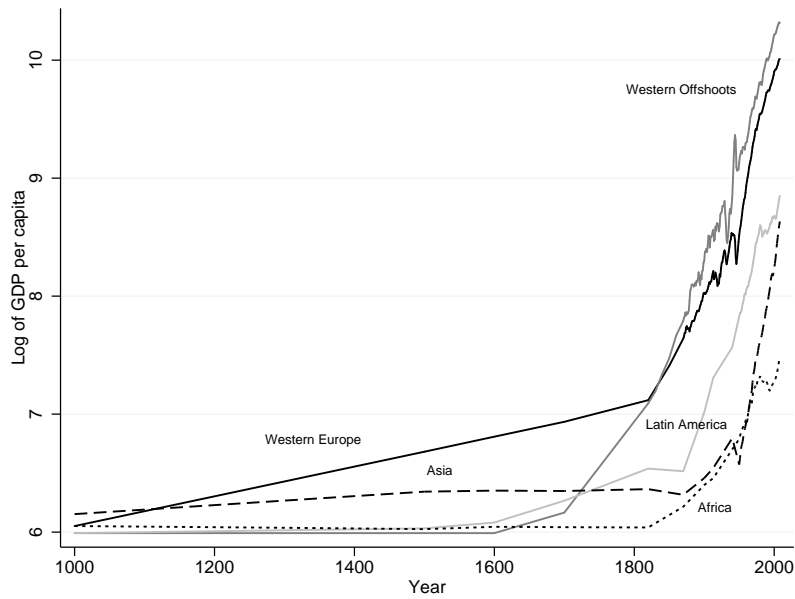
The Social Challenge



- ▶ 1820, the ratio between the West and the “Rest” is 2 to 1

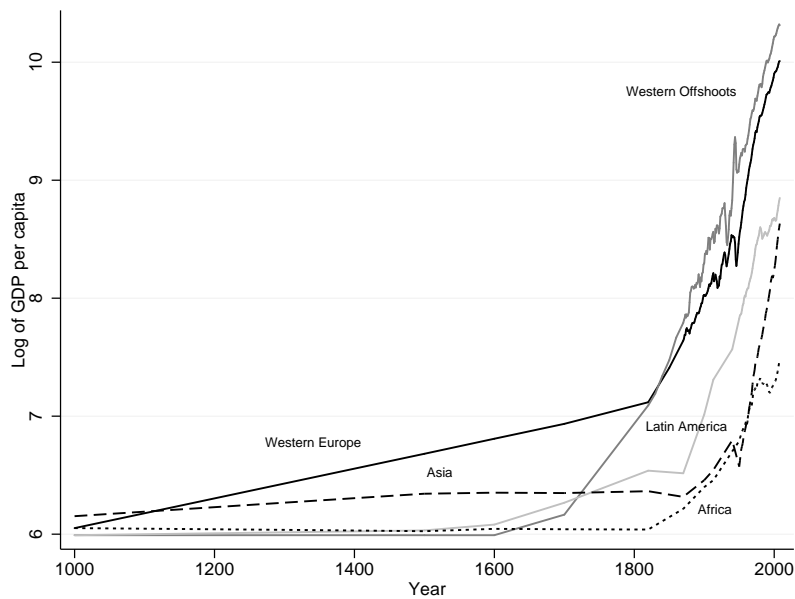
4 / 65

The Social Challenge



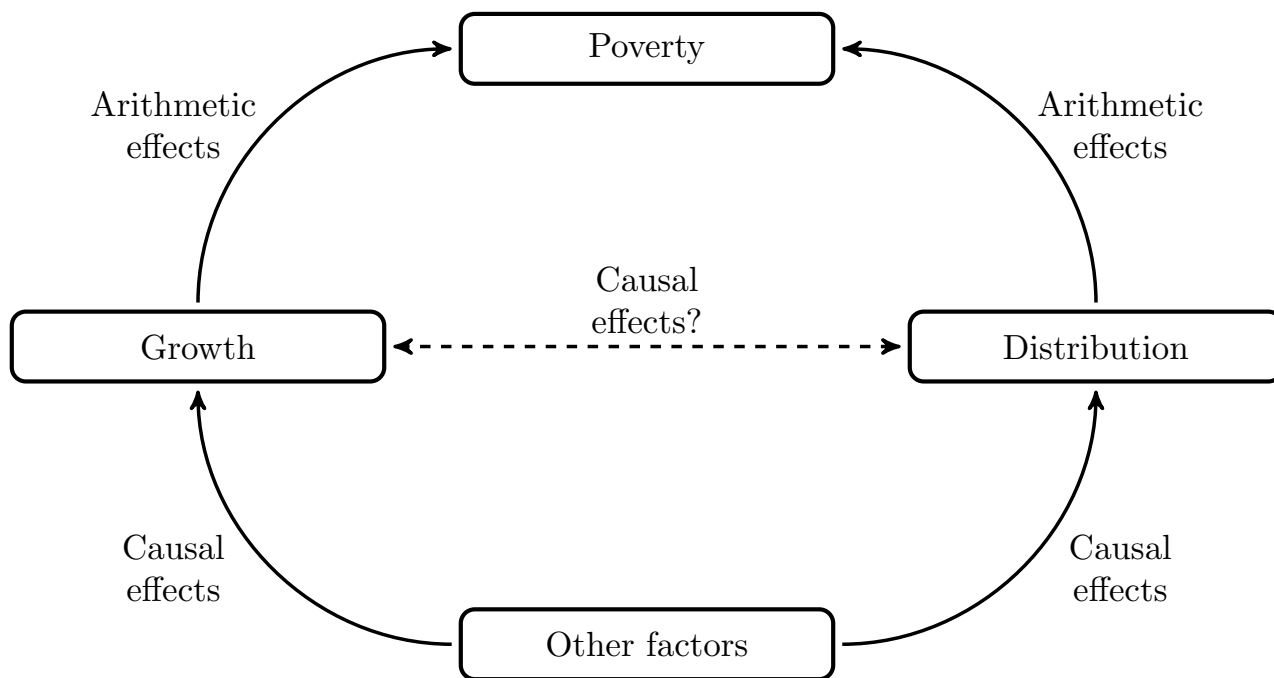
- ▶ 1820, the ratio between the West and the “Rest” is 2 to 1
- ▶ 2007, the ratio between high income to low income is 21 to 1.

The Social Challenge



- ▶ 1820, the ratio between the West and the “Rest” is 2 to 1
- ▶ 2007, the ratio between high income to low income is 21 to 1.
- ▶ and ratio of poorest (ZAR) to richest (USA) is 129 to 1!

Outline of the approach



7 / 65

International poverty and inequality comparisons (monetary and asset-based)

8 / 65

Introduction

The questions we'll try to answer in this session:

- ▶ How is poverty of nations related to poverty of people?
- ▶ How do did we set the 'dollar-a-day' international poverty line?
- ▶ Can we reliably estimate the number of poor people in the world? What about the change in poverty?
- ▶ Has the poverty rate been halved in 2015 as set out in the MDGs? Will 2030 mark the "end of extreme poverty"?
- ▶ Is global inequality falling or rising?
- ▶ Last, do asset/multidimensional measures agree?

Part I: International poverty lines and poverty levels

International poverty comparisons

The main focus:

- ▶ In this class, we are mainly concerned with *absolute poverty*, not relative poverty which also occurs in developed countries
- ▶ Poverty is undoubtedly multidimensional, but here we'll focus on monetary poverty (and discuss the trade offs later).

First problem: how to count the *global poor*?

11 / 65

International poverty comparisons

The main focus:

- ▶ In this class, we are mainly concerned with *absolute poverty*, not relative poverty which also occurs in developed countries
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First problem: how to count the *global poor*?

- ▶ Add up all the poor as estimated by local statistical offices?
- ▶ Use National Accounts data on private household consumption together with assumptions (or real data) on the distribution?
- ▶ Conduct standardized and nationally representative surveys in (all) developing countries?

12 / 65

Potential pitfalls

- ▶ National poverty lines differ
 - ▶ a poor person in India lives with less than 1\$/day while a poor person in the United States has less than 13\$/day
- ▶ Prices and subsistence needs are not the same
 - ▶ market exchange rates are only relevant for tradable goods
 - ▶ same consumption pattern across countries or income groups?
 - ▶ what about inflation within countries?
- ▶ Poverty of what and who?
 - ▶ consumption/ expenditure versus income
 - ▶ households versus individuals, equivalence scaling?
- ▶ Percent poor of how many people?
 - ▶ censuses are undertaken infrequently or may be missing
 - ▶ we need projections between census periods

13 / 65

How did we get to one dollar a day?

International poverty lines

- ▶ Extreme poverty – the ‘dollar-a-day’ line is a lower bound of national poverty lines set via cost of basic needs approach
- ▶ Before 2009, based on a sample of 22 countries around 1980s
- ▶ After 2009, 77 countries post-1990 → revision to 1.25\$ a day
- ▶ After 2015, same sample → revision to 1.90\$ a day

The International Comparison Project (ICP)

- ▶ Compiles *purchasing power parity* estimates around the globe
- ▶ Revised every couple of years, huge changes in 2005 and 2011
- ▶ Designed for comparing living standards of entire countries, not “just” poor people!

14 / 65

A brief history of IPLs

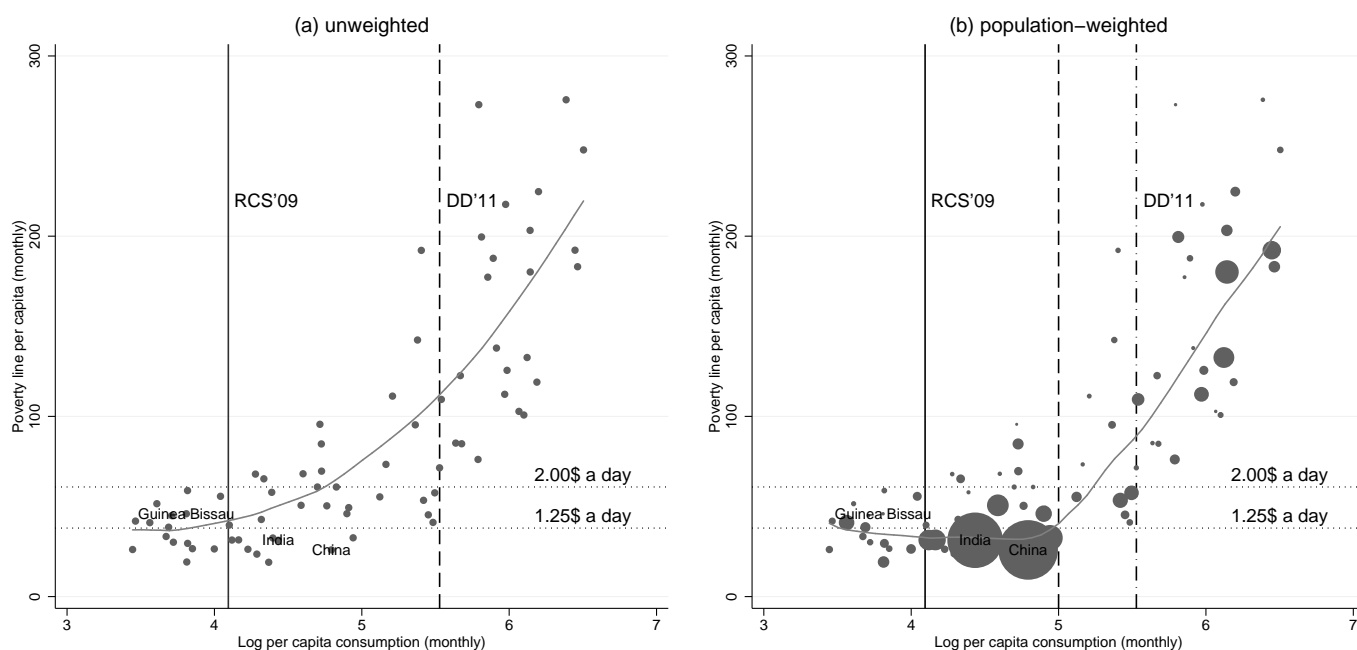
Year	1979	1990	2001	2008	2015
ICP data	1975	1985	1993	2005	2011
PL sample	1 (India)	8	10	15	15
Method	India's PL	"Inspection"	Median	Mean	Mean
IPL (ICP base)	\$0.56	\$1.00	\$1.08	\$1.25	\$1.90
IPL in \$1985	\$1.12	\$1.02	\$0.80	\$0.69	\$0.91

Source: Ferreira et al. (2015)

- ▶ History of IPLs and ICP waves are intimately linked.
- ▶ 1990–2008 IPLs and revisions all due to Martin Ravallion.
- ▶ 2015, Ravallion is no longer with the World Bank.
- ▶ 2015 update is the first that implies a higher PL in 1985 USD!

15 / 65

The 1.25\$ a day update in 2008



Deaton (2010) criticizes that 2008 update leads to “graduation effects” and discontinuities in global poverty counts.

16 / 65

Sensitivity of the 1.25\$ a day line

Estimation Sample	Consumption		Int'l Poverty Lines (in 2005 PPP\$)						
	ln(C*)	C*	No Weights			Pop. Weights			N
			\bar{Z}	Z*	Q ₅₀ (z)	\bar{Z}	Z*		
RCS'09	4.09	60.00	1.25	1.25	1.27	1.17	1.17	15	
Alternative	5.00	148.41	1.46	1.46	1.38	1.06	1.06	39	
DD'11	5.53	251.59	1.76	1.26	1.51	1.12	1.00	50	
Full	6.50	668.31	2.91	1.46	2.00	1.84	1.06	74	

\bar{Z} is the (unweighted or weighted) average poverty line. $Q_{50}(Z)$ is the (unweighted) median poverty line. The regression based columns estimate the average level of the poverty line before the consumption gradient turns positive. We obtain Z^* from $Z_i = Z^* I_i + (\alpha + \beta C_i) \times (1 - I_i)$, where Z_i is the national poverty line expressed in 2005 PPP dollars, Z^* is the mean poverty line for the reference group, C_i is average per capita consumption in 2005 PPP dollars, and I_i is one if $C_i \leq C^*$ and zero otherwise.

- ▶ IPL is very sensitive to choices (method, samples and weights)
- ▶ Fundamental uncertainty about *levels* of extreme poverty

17 / 65

The revision of prices

Country	GDPpc 1993 PPP\$	GDPpc 2005 PPP\$	Revision in %
Vietnam	3106	2143	-31%
Philippines	4991	2956	-41%
Mexico	10356	11387	+10%
Japan	31262	30290	-3%
Nigeria	1200	1520	+27%
Bangladesh	2025	1068	-47%
Russia	11053	11858	+7%
Pakistan	2437	2184	-10%
Brazil	8854	8474	-4%
Indonesia	3898	3209	-18%
United States	42454	41813	-2%
India	3536	2222	-37%
China	6666	4088	-39%
Average	10141	9478	-14%

Source: Milanovic (2011)

- ▶ ICP 1993, 123 countries, *excl.* China, India & much of SSA
- ▶ ICP 2005, 146 countries, *incl.* China and India

18 / 65

The World Bank's methodology I

The data

- ▶ Conduct/compile national surveys in developing countries
- ▶ Prefer consumption/ expenditure of households (per capita) over income
- ▶ Assume no one is poor above chosen poverty lines in developed countries
- ▶ Data available in *PovcalNet*, by 2016:
 - ▶ > 1000 surveys
 - ▶ 128 developing countries
 - ▶ 1981 to 2013
 - ▶ > 2 million randomly sampled households
 - ▶ 87% of the population of the developing world.
- ▶ Check it out: iresearch.worldbank.org/povcalnet

19 / 65

The World Bank's methodology II

- ▶ Set an absolute poverty line (e.g. \$1.25 or \$1.90 per day in base year PPP dollars)
- ▶ Convert poverty lines via PPP rates into domestic currencies in the base year (e.g. 2005 or 2011)
- ▶ Use local price indices (CPI) to adjust to other years than base
- ▶ Use unit level or grouped income/ expenditure data to either estimate poverty directly (unit-level) or by first estimating parametric Lorenz curves (grouped data)
- ▶ Calculate poverty and inequality indicators for each country in three-year intervals, interpolate from intermediate surveys
- ▶ Population-weight the country estimates to give regional total (assume non-surveyed countries are as poor as the region) and world-wide total

20 / 65

1.08\$ a day poverty rates at 1993 PPPs

	Year				
	1981	1990	1999	2005	2010
East Asia and Pacific	57.73	29.84	15.46	12.33	9.05
only China	63.76	32.98	17.77	13.79	9.90
Eastern Europe and Central Asia	0.70	0.46	3.78	1.27	0.94
Latin America and Caribbean	10.77	10.19	9.66	9.09	8.64
Middle East and North Africa	5.08	2.33	2.08	1.69	1.47
South Asia	49.57	43.04	34.92	33.56	30.84
only India	51.75	44.31	37.66	36.03	34.33
Sub-Saharan Africa	42.26	46.73	45.77	42.63	41.10
Total	40.14	28.66	22.10	20.13	18.09

Source: Ferreira and Ravallion (2008)

Number of poor people at 1.08\$ a day (in millions):

- ▶ 1470.28 in 1981, 1247.68 in 1990 and 969.48 in 2004

21 / 65

1.25\$ a day poverty rates at 2005 PPPs

	Year				
	1981	1990	1999	2005	2010
East Asia and Pacific	77.18	56.24	35.58	17.11	12.48
only China	84.02	60.18	35.63	16.25	11.62
Europe and Central Asia	1.91	1.91	3.79	1.33	0.66
Latin America and Caribbean	11.89	12.24	11.86	8.66	5.53
Middle East and North Africa	9.56	5.75	5.01	3.45	2.41
South Asia	61.14	53.81	45.11	39.43	31.03
only India	59.83	51.31	45.62	40.82	32.67
Sub-Saharan Africa	51.45	56.53	57.89	52.31	48.47
Total	52.16	43.05	34.07	25.09	20.63

Source: PovcalNet and Chen and Ravallion (2010, 2013)

- ▶ Decomposing the change from old to new estimates: Total Δ
 $= \Delta$ PPP on IPL + Δ PPP on GDP + Δ IPL = A + B + C
- ▶ A = -21%, B = 17%, C = 11%, net effect PPPs = -4%

22 / 65

1.25\$ a day poor population at 2005 PPPs

	Year				
	1981	1990	1999	2005	2010
East Asia and Pacific	1096.5	926.42	655.59	332.08	250.90
only China	835.07	683.15	446.35	211.85	155.51
Europe and Central Asia	8.21	8.87	17.83	6.26	3.15
Latin America and Caribbean	43.33	53.43	60.10	47.60	32.29
Middle East and North Africa	16.48	12.96	13.64	10.47	7.98
South Asia	568.38	617.26	619.46	598.26	506.77
only India	428.68	448.34	472.74	466.30	400.08
Sub-Saharan Africa	204.93	289.68	375.97	394.78	413.73
Total	1937.83	1908.45	1742.53	1389.2	1214.98
Total excl. China	1102.76	1225.30	1296.18	1177.35	1059.31

Source: PovcalNet and Chen and Ravallion (2010, 2013)

- ▶ Revision in '08 added 450 million poor people!
- ▶ Tremendous progress in China, some progress outside of EAP

23 / 65

2.00\$ a day poverty rates at 2005 PPPs

	Year				
	1981	1990	1999	2005	2010
East Asia and Pacific	92.41	80.97	61.67	39.03	29.73
only China	97.81	84.64	61.44	36.94	26.82
Europe and Central Asia	8.32	6.78	12.23	4.60	2.35
Latin America and Caribbean	23.77	22.36	21.99	16.69	10.37
Middle East and North Africa	30.06	23.46	21.96	17.37	12.04
South Asia	87.20	83.58	77.83	73.36	66.71
only India	86.63	82.62	78.92	75.02	68.72
Sub-Saharan Africa	72.20	75.95	77.49	74.08	69.87
Total	69.59	64.60	57.43	46.88	40.67

Source: PovcalNet and Chen and Ravallion (2010, 2013)

- ▶ Bunching up at 2\$'s in India; 97.81% to 26.82% in China
- ▶ Very little progress in Sub-Saharan Africa, only 2.4 p.p.
- ▶ Poor people: 2585 mil. in 1981 and 2395 mil. in 2010!

24 / 65

1.90\$ a day poverty rates at 2011 PPPs

	Year							
	2012		2011		1999		1990	
	1.25	1.90	1.25	1.90	1.25	1.90	1.25	1.90
East Asia and Pacific	-	7.2	7.9	8.5	35.9	37.5	57	60.8
Europe and Central Asia	-	2.5	0.5	2.7	3.8	7.8	1.5	1.9
Latin America and Caribbean	-	6.2	4.6	6.5	11	14.1	12.6	17.7
Middle East and North Africa	-	-	1.7	-	4.8	-	5.8	-
South Asia	-	18.8	24.5	22.3	45	41.2	54.1	50.6
Sub-Saharan Africa	-	42.6	46.9	44.3	59.4	58.1	56.8	56
Total	-	12.8	14.2	14.5	29	29	36.5	37.1

Source: Ferreira et al. (2015)

- ▶ Percent of poor is about the same, composition differs a bit.
- ▶ Number of poor hardly changed (987.4 v 1011.4 mil. people).

25 / 65

Conclusions on *levels* of poverty

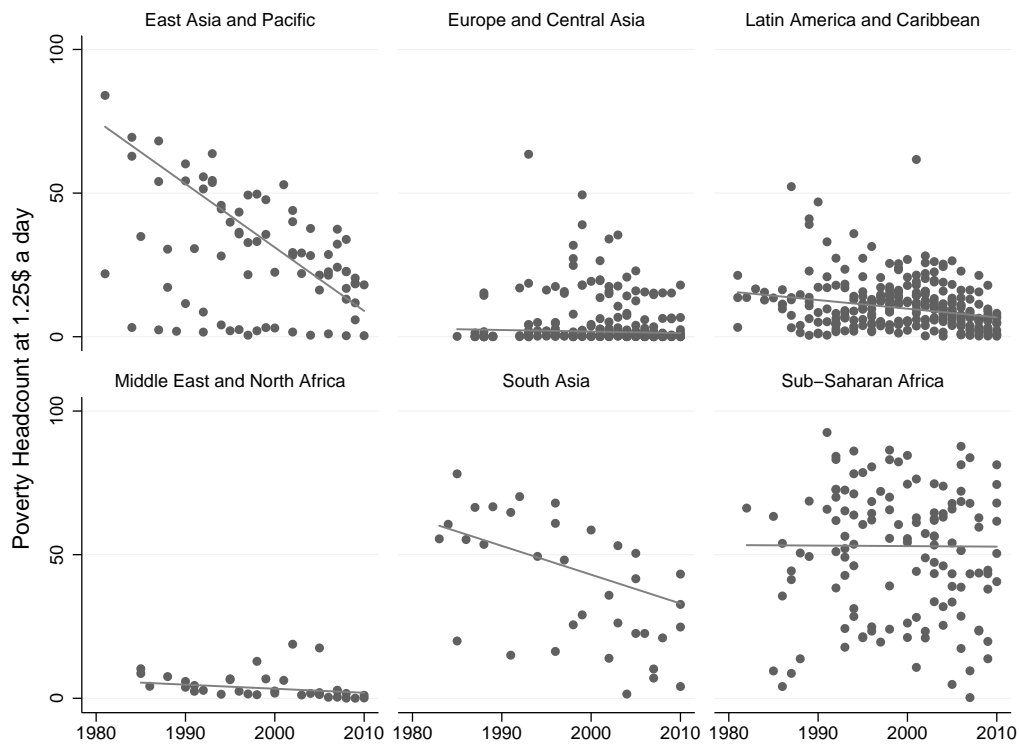
- ▶ Huge uncertainty about exact levels of extreme poverty
- ▶ Lots of other methodological choices affect the level of poverty
 - ▶ PPPs do not reflect consumption patterns of the poor
 - ▶ Inflation for poor people (food) may differ from CPI
 - ▶ Inflation may differ across space (urban/rural)
 - ▶ Others have argued that comparisons should be based on GDP per capita or consumption from National Accounts
- ▶ No conceptual reason why new ICPs should change the past
- ▶ Global poverty measurement remains controversial
- ▶ On the plus side, most approaches show a decrease in poverty
- ▶ First MGD target was reached globally in 2010

26 / 65

Part II: Poverty and inequality trends

27 / 65

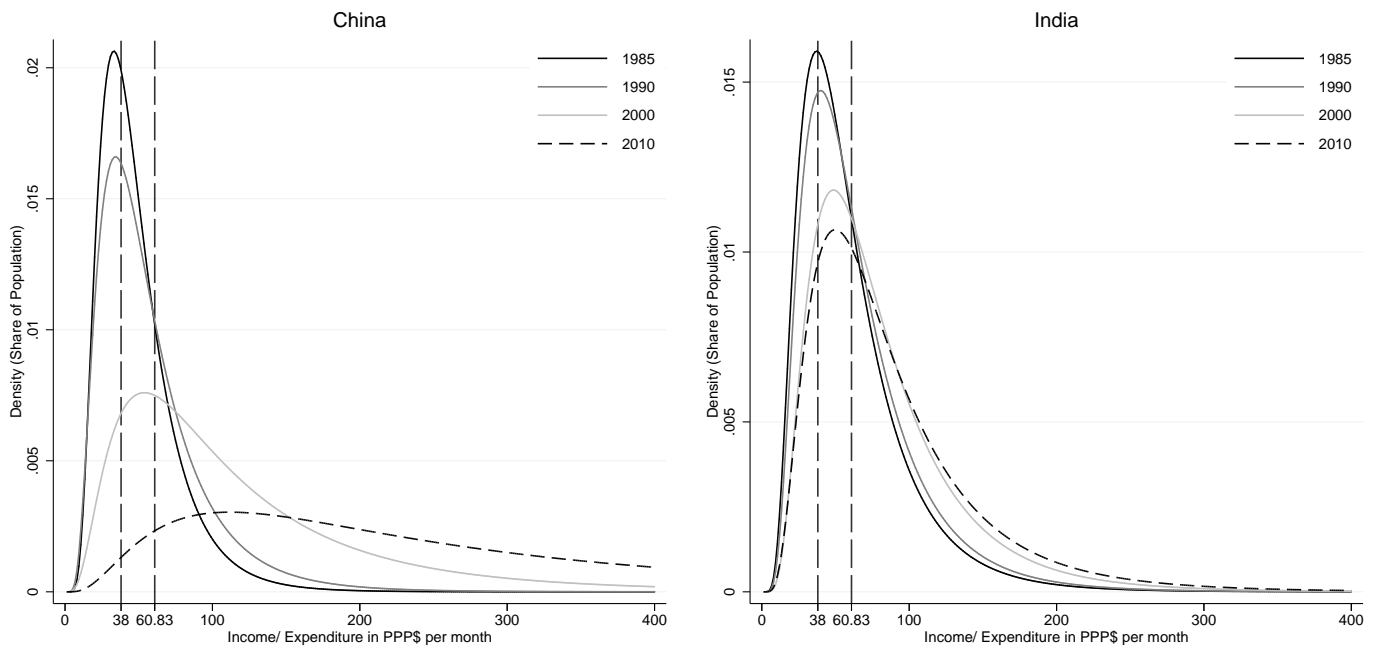
Regional poverty trends 1981 to 2010 1.25\$ a day



- Global speed is 1 *percentage point* per annum, EAP = 2.2 ppa, SAS = 1 ppa, and SSA = 0.02 ppa

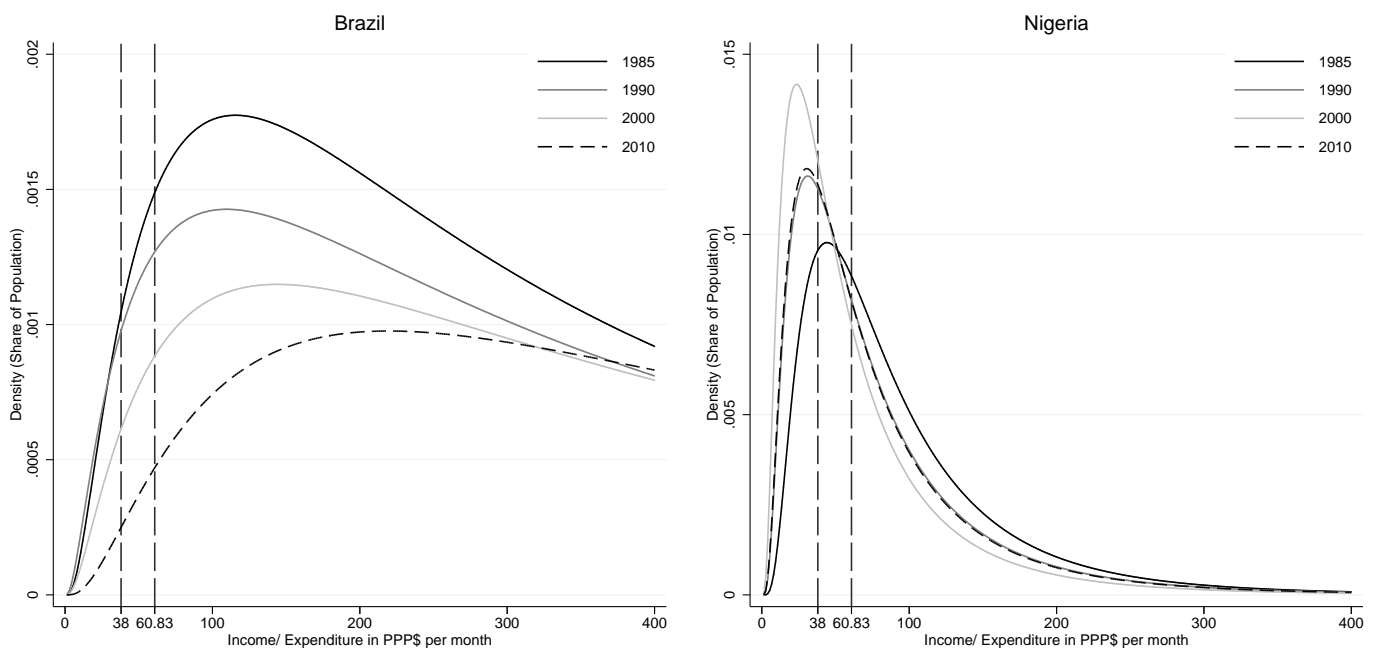
28 / 65

Expenditure distribution: China and India, 1985–2010



- By 2010, poverty reduction potential from China is exhausted; bunching up a 2\$/day in India, more potential going forward

Expenditure distribution: Brazil and Nigeria, 1985–2010



- High inequality keeps people in poverty in Brazil; Poverty in Nigeria is *higher* in 2000 or 2010 than in 1985.

International inequality: three concepts

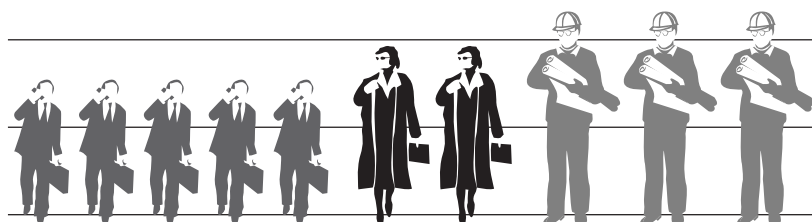
- ▶ Concept 1 inequality aka. (unweighted) between inequality
 - ▶ unweighted international inequality (countries count the same)
 - ▶ based on each country's GDP per capita
 - ▶ compares "representative" individuals
- ▶ Concept 2 inequality aka. (weighted) between inequality
 - ▶ weighted international inequality (population weights)
 - ▶ based on each country's GDP per capita
 - ▶ compares scaled "representative" individuals
- ▶ Concept 3 inequality aka. overall inequality
 - ▶ joint within and between country inequality
 - ▶ GDP per capita, or (better) survey mean + distribution data
 - ▶ ranks all individuals from the poorest to the richest

31 / 65

Three concepts: an illustration



Concept 1: three countries and three representatives with mean incomes (height)



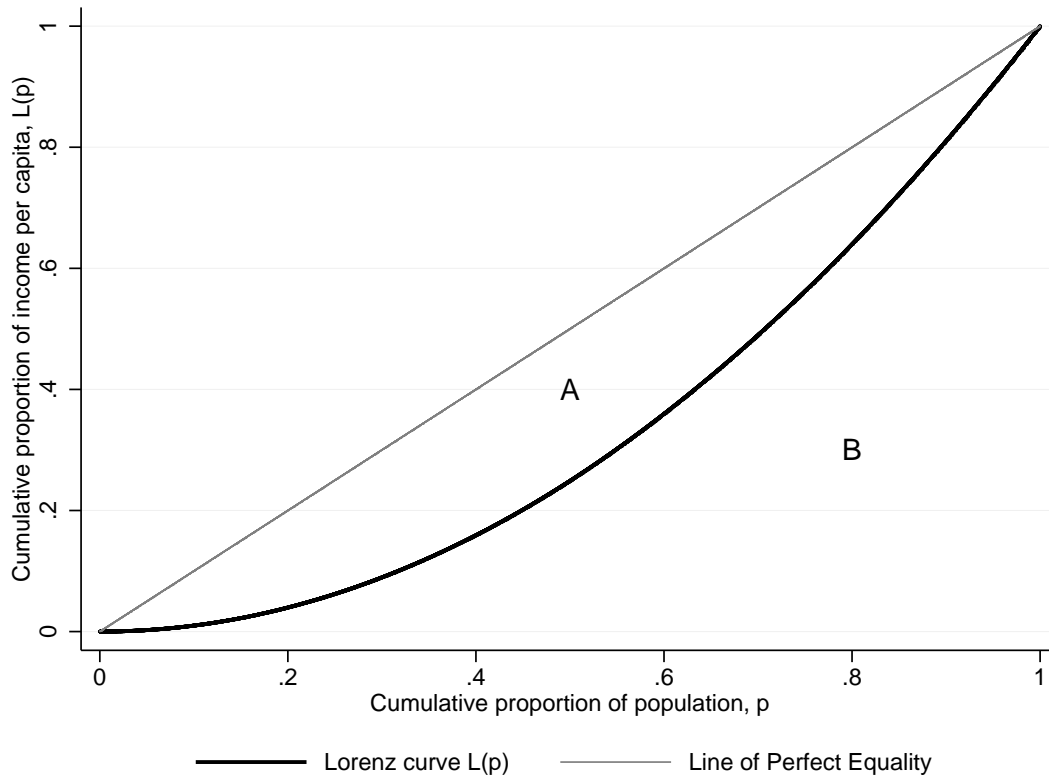
Concept 2: entire population included but with mean incomes (height)



Concept 3: all individuals with their actual heights (incomes)

32 / 65

The Lorenz curve



33 / 65

Popular inequality measures

Gini coefficient:

$$G = 1 - 2 \int_0^1 L(p) dp$$

$$G = (2N^2\mu)^{-1} \sum_i \sum_j |y_i - y_j|$$

or simply $A/(A + B)$, where $A = 45^\circ$ to $L(p)$ and B is $L(p)$ to 0.

Theil indices (generalized entropy):

$$GE(0) = T = N^{-1} \sum_i \ln \left(\frac{y_i}{\bar{y}} \right)$$

$$GE(1) = L = N^{-1} \sum_i \frac{y_i}{\bar{y}} \ln \left(\frac{y_i}{\bar{y}} \right).$$

34 / 65

What makes a good inequality measure?

Axiomatic criteria

1. *Mean independence*. If all incomes are doubled, measured inequality should not change.
2. *Population size independence*. If the population were to change, measured inequality should not change, all else equal.
3. *Symmetry*. If any two people swap incomes, there should be no change in the measure of inequality.
4. *Pigou-Dalton transfer principle*. A transfer of income from rich to poor reduces measured inequality.

Also nice to have:

Decomposability. Inequality may be broken down by population groups or income sources or in other dimensions.

35 / 65

Advantages and disadvantages

The Gini index satisfies:

- ▶ Mean independence
- ▶ Population size independence
- ▶ Symmetry
- ▶ Pigou-Dalton transfer principle

but is *not* subgroup decomposable.

The GE / Theil indices satisfy all of the above and, are *additively decomposable*.

The Gini coefficient is a very popular measure because of its connection to the Lorenz curve. Theil is sometimes more useful.

36 / 65

Decomposing Theil's T index

Let Y be total income of all N individuals, and $\bar{y} = Y/N$ be mean income. Likewise, Y_j is total income of a subgroup with N_j members, and $\bar{y}_j = Y_j/N_j$ is their mean income. Then

$$T = \sum_i \frac{y_i}{N\bar{y}} \ln \left(\frac{y_i N}{\bar{y} N} \right)$$

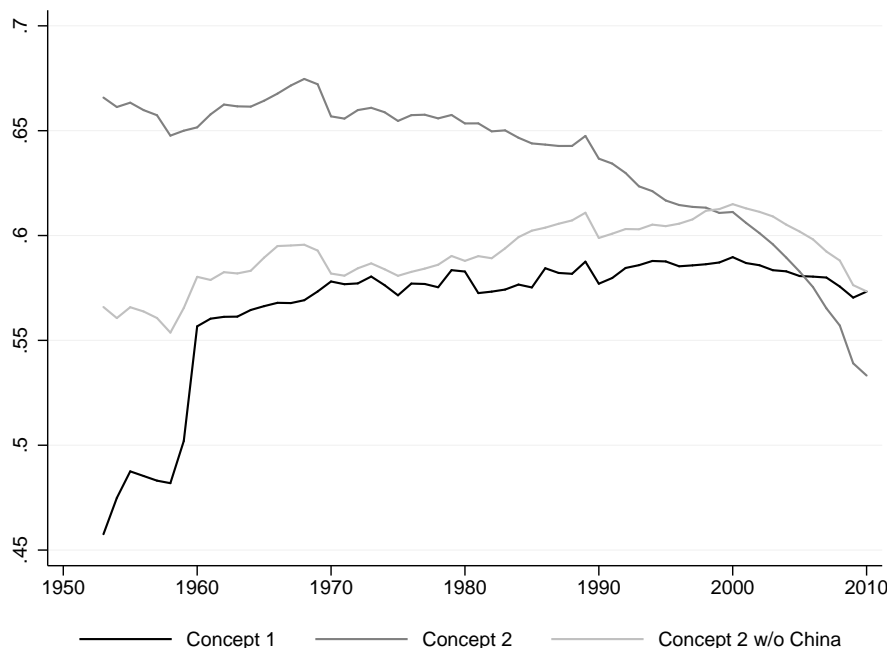
$$T = \sum_i \frac{y_i}{Y} \ln \left(\frac{y_i N}{Y} \right)$$

$$T = \underbrace{\sum_j \frac{Y_j}{Y} T_j}_{\text{within}} + \underbrace{\sum_j \frac{Y_j}{Y} \ln \left(\frac{Y_j/Y}{N_j/N} \right)}_{\text{between}}$$

where T_j is Theil's T for subgroup j .

37 / 65

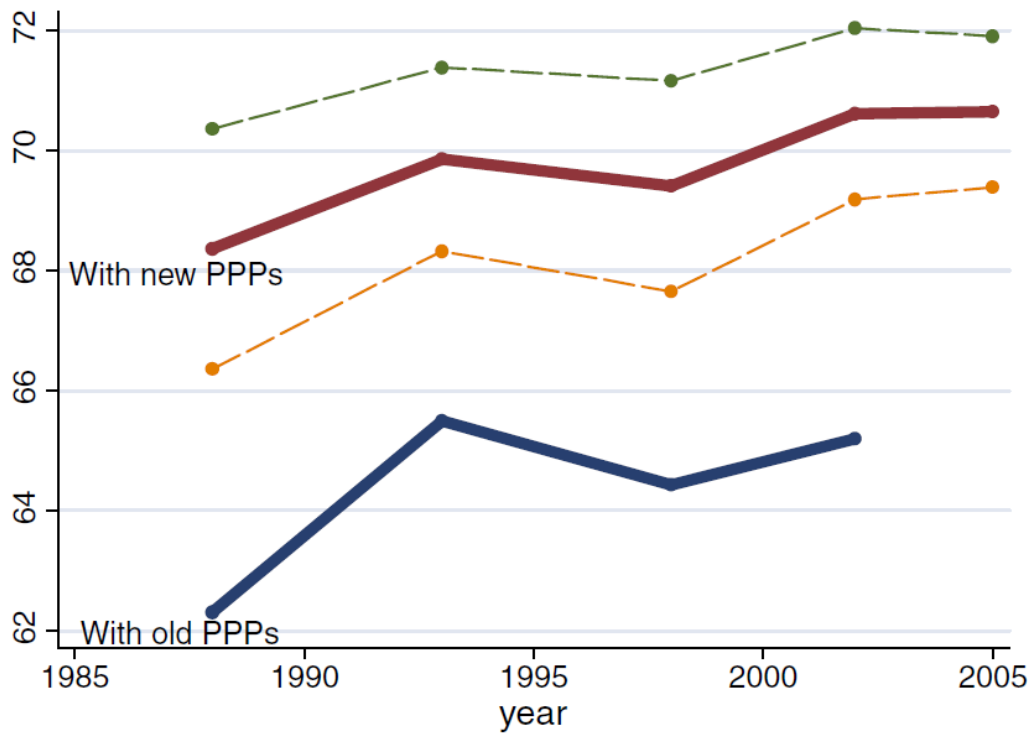
Global inequality: concepts 1 and 2 (2005 PPPs)



- ▶ Concept 2 inequality is falling due to rapid growth in China, rising until 2000 without
- ▶ After 2000 India grows faster, concept 2 inequality falls more

38 / 65

Global inequality: concept 3 (1993 vs 2005 PPPs)



Source: Milanovic (2012)

- Concept 3 or overall inequality is very high and rising on this measure! However, many other studies show it's falling.

39 / 65

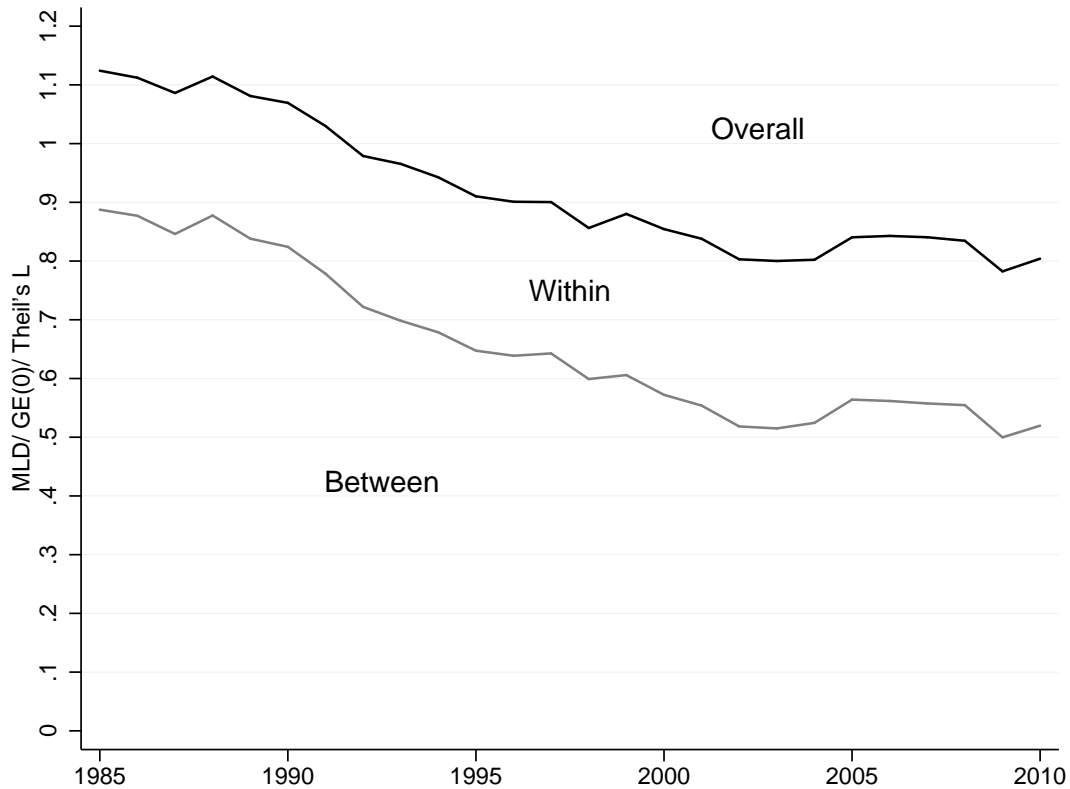
Inequality in the developing world, 1980–2010

Year	Gini coefficient			Mean	Population	N
	Overall	Within	Between			
1980	0.596	0.356	0.486	73.29	2907.8	83
1985	0.555	0.353	0.421	79.05	3223.2	86
1990	0.578	0.367	0.449	95.98	4049.3	104
1995	0.559	0.385	0.411	98.41	4555.2	114
2000	0.537	0.395	0.374	102.45	4931.4	121
2005	0.535	0.399	0.372	120.34	5285.6	123
2010	0.554	0.404	0.399	150.72	5625.1	123
Δ 1980-2010 (%)	-7.19	13.63	-17.82	—	—	—
Δ 1990-2010 (%)	-4.17	10.10	-11.08	—	—	—
Δ 2000-2010 (%)	3.07	2.20	6.64	—	—	—

- Rising *overall* and *within-country* inequality, falling *between-country* inequality (all driven by China)
- Uptick in *overall* and *between-country* inequality after 2005

40 / 65

Theil decomposition: developing countries



41 / 65

Patterns of Inequality

The rise in global concept 3 inequality is product of many trends:

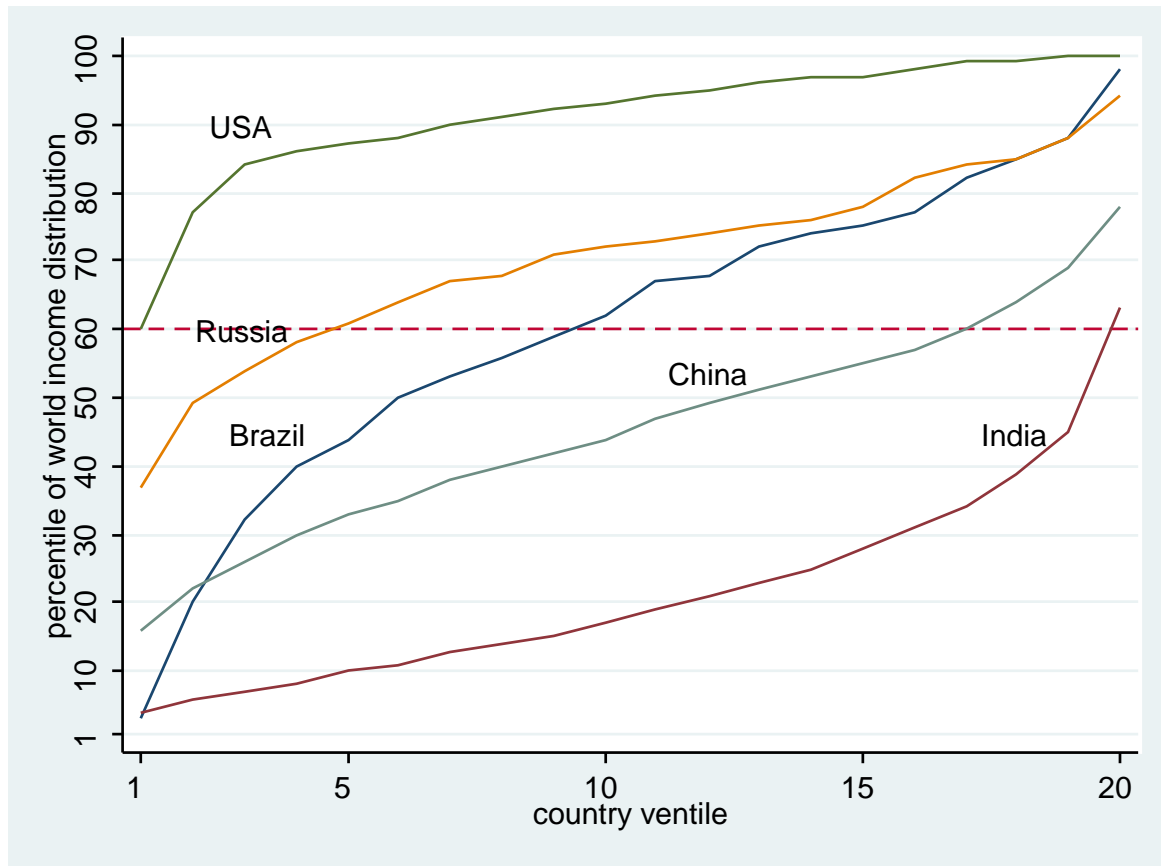
- ▶ Greater within-country inequality (e.g. China + rich countries)
- ▶ Greater difference in mean incomes (mostly divergence between 1950-1980, then convergence for some)
- ▶ Rapid catch-up of some countries, notably China and India (leading to both concept 1 & 2 convergence since 2000)

What does this imply? Location matters.

- ▶ Today, between-country inequality accounts for about 80% of overall inequality
- ▶ In 1870, (time of Marx's Das Kapital) global inequality was driven by within-country inequality about 70% due to "class"
- ▶ How poor are the richest people in poor countries relative to poor people in rich countries?

42 / 65

Location versus “class”



43 / 65

Conclusions on poverty and inequality trends

- ▶ *Trends* in global poverty and inequality are more robust
 - ▶ progress driven by fast growth in China and moderately rapid growth in South Asia
 - ▶ Sub-Saharan Africa is lagging behind but faster growth and poverty alleviation since 2000
 - ▶ not many extremely poor left in China
 - ▶ falling overall and between-country inequality in the developing world driven by China (but subject to change)
 - ▶ rising within-country inequality
 - ▶ most studies report falling global inequality, some estimate rise
- ▶ Changing composition of the world's poor has huge implications going forward

44 / 65

Part III: The future of global poverty

45 / 65

New targets and the post-2015 agenda

- ▶ Jim Yong Kim, WBG President, UGeorgetown, April, 2013:

“We are at an auspicious moment in history, when the successes of past decades and an increasingly favorable economic outlook combine to give developing countries a chance, for the first time ever, to end extreme poverty within a generation.”

- ▶ Based on a recent study by Ravallion (2013), the World Bank aims to “end poverty by 2030”, that is, achieve a target 1.25\$ a day poverty rate of 3% by 2030.
- ▶ SDGs embraced and adopted this goal

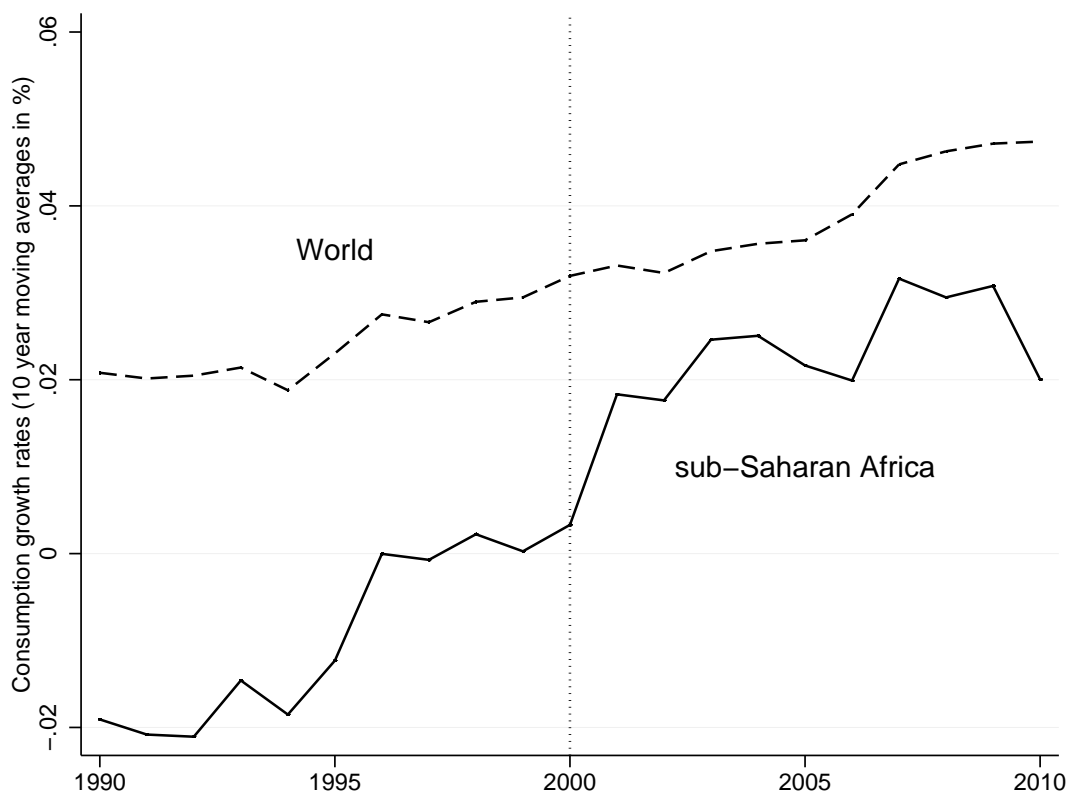
46 / 65

Assumptions and Methodology

- ▶ Three *country-specific* growth scenarios
 - ▶ Optimistic (average PCE growth 2000-2010)
 - ▶ Moderate (average PCE growth 1980-2010)
 - ▶ Pessimistic (average PCE growth 1980-2000)
- ▶ Three *country-specific* distribution scenarios
 - ▶ Pro-poor (change in Gini -0.5% p.a.)
 - ▶ Distribution neutral (no change in Gini)
 - ▶ Pro-rich (change in Gini $+0.5\%$ p.a.)
- ▶ Forecasting using PovcalNet surveys and econometric model for censored data (Bluhm et al., 2013)

47 / 65

Consumption growth (10-yr moving averages)



48 / 65

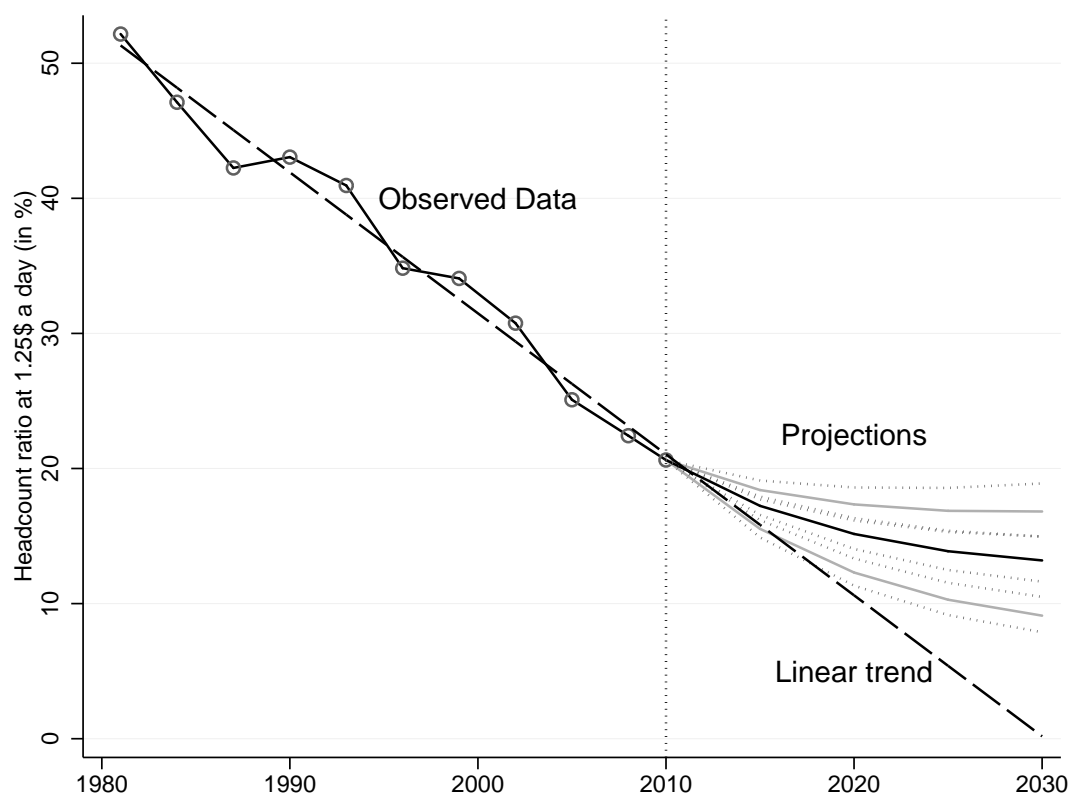
Consumption growth from NAS

	<i>Period</i>				
	2000 – 2010	1990 – 2010	1980 – 2010	1980 – 2000	1990 – 2000
East Asia and Pacific	5.906 (0.813)	5.772 (0.653)	5.598 (0.725)	5.377 (0.677)	5.608 (0.508)
Europe and Central Asia	6.085 (0.989)	2.755 (0.412)	2.558 (0.411)	-0.769 (0.916)	-1.225 (1.027)
Latin America and Caribbean	2.444 (0.239)	2.219 (0.140)	1.445 (0.098)	0.677 (0.171)	1.931 (0.337)
Middle East and North Africa	3.495 (0.443)	2.532 (0.440)	1.851 (0.293)	0.495 (0.545)	1.253 (0.648)
South Asia	4.448 (0.489)	3.612 (0.388)	3.179 (0.351)	2.173 (0.284)	2.511 (0.294)
Sub-Saharan Africa	2.382 (0.689)	1.419 (0.470)	0.698 (0.472)	-0.818 (0.540)	0.016 (0.688)
Overall average	4.544 (0.152)	3.809 (0.132)	3.437 (0.114)	2.565 (0.161)	2.862 (0.225)
<i>N</i>	123	123	123	122	122
\bar{T}	10.99	20.64	27.16	16.30	9.730
$N \times \bar{T}$	1352	2539	3341	1989	1187

Population-weighted means. Cluster robust standard errors in parentheses.

49 / 65

Actual and projected poverty rates at 1.25\$ a day



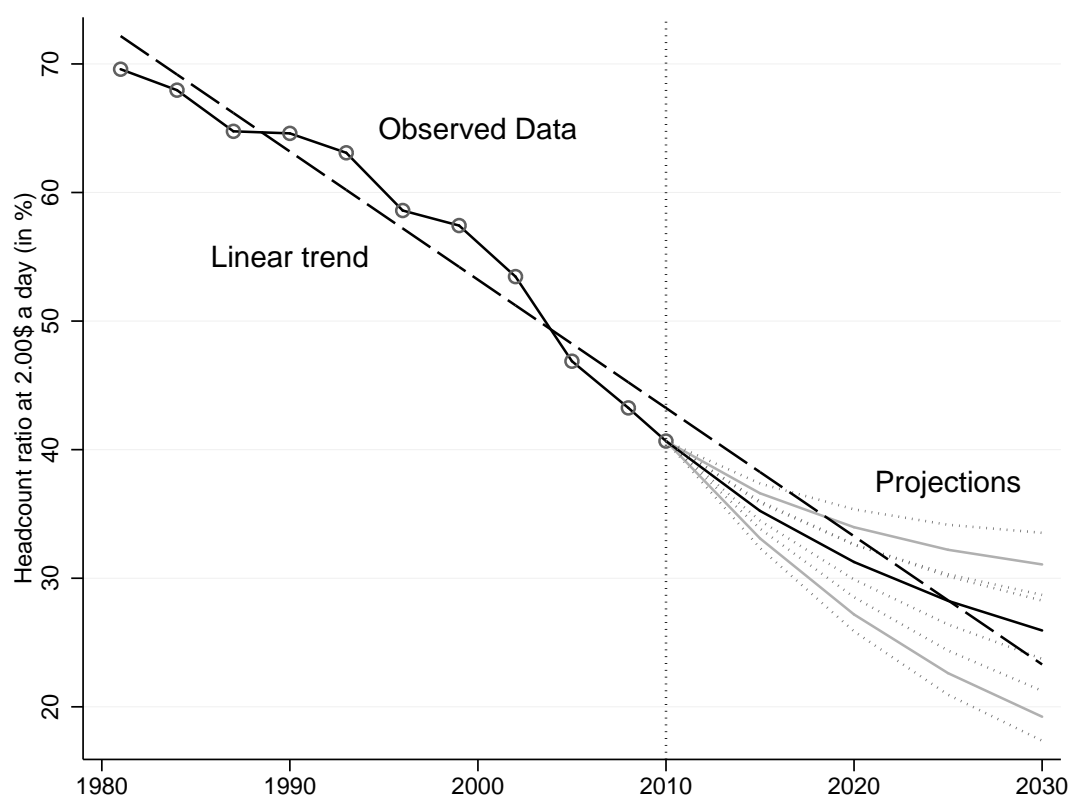
50 / 65

Projected poverty rates in 2030 at 1.25\$ a day

	Optimistic (2000-2010)		
	pro-poor	neutral	pro-rich
<i>Panel (a): Poverty headcount ratio (in %)</i>			
East Asia and Pacific	0.65	0.93	1.31
Europe and Central Asia	0.12	0.16	0.21
Latin America and Caribbean	2.27	2.74	3.28
Middle East and North Africa	0.48	0.66	0.91
South Asia	4.19	5.54	7.24
Sub-Saharan Africa	32.09	35.69	39.37
Total	7.88	9.11	10.49
<i>Panel (b): Poverty headcount (in millions)</i>			
East Asia and Pacific	14.05	20.23	28.56
Europe and Central Asia	0.59	0.76	0.97
Latin America and Caribbean	16.15	19.44	23.32
Middle East and North Africa	2.12	2.94	4.04
South Asia	83.47	110.38	144.35
Sub-Saharan Africa	449.54	499.97	551.61
Total	567.20	655.36	754.95

51 / 65

Actual and projected poverty rates at 2.00\$ a day



52 / 65

Projected poverty rates in 2030 at 2.00\$ a day

	Optimistic (2000-2010)		
	pro-poor	neutral	pro-rich
<i>Panel (a): Poverty headcount ratio (in %)</i>			
East Asia and Pacific	3.79	4.61	5.55
Europe and Central Asia	0.45	0.56	0.69
Latin America and Caribbean	4.00	4.73	5.59
Middle East and North Africa	2.85	3.55	4.39
South Asia	19.83	23.12	26.74
Sub-Saharan Africa	51.62	54.56	57.46
Total	17.36	19.23	21.24
<i>Panel (b): Poverty headcount (in millions)</i>			
East Asia and Pacific	82.42	100.20	120.61
Europe and Central Asia	2.12	2.63	3.26
Latin America and Caribbean	28.39	33.63	39.73
Middle East and North Africa	12.64	15.74	19.47
South Asia	395.33	461.03	533.21
Sub-Saharan Africa	723.19	764.47	805.00
Total	1249.19	1383.61	1528.08

53 / 65

Comparison with World Bank study

Why are these results so different from Ravallion (2013)?

- ▶ Ravallion focuses on (too) optimistic scenario, linear trend: no 1.25\$/day poverty in 2030
- ▶ Ravallion backsolves for *uniform* growth rate in PovcalNet
- ▶ 3% poverty in 2027/2030 *iff* all countries grow at 4.5% (post-2000 trend rate of all developing countries)
- ▶ Composition of the average matters! Using the post-2000 trend rate of *each country*
 - ▶ all scenarios show a slowdown sooner or later
 - ▶ huge acceleration in Sub-Saharan Africa needed to get anywhere close to the new 3% target
 - ▶ about 8% in 2030 *is a very optimistic scenario!*
- ▶ We know the \$1.90 results will look very similar.

54 / 65

“Conclusions” on the future

- ▶ Extreme poverty is *unlikely* to end in 2030 and the pace of poverty reduction slows in all of our scenarios
- ▶ Poverty reduction at 2\$ a day poverty is likely to continue very quickly, may accelerate and slow late or not at all (2010-2030)
- ▶ At 2\$ day, our optimistic scenario suggests that *one billion* people can be lifted into the “middle class” (2\$,13\$)

Back then, we proposed two new alternate ‘twin targets’:

“Reduce the proportion of the population living below 1.25\$ to 8% by 2030 and reduce the proportion of the population living below 2\$ a day to 18% by 2030”

- ▶ Reaching both targets requires more growth or improvements in distribution, current path is *not* enough!

Part IV: Asset-based consumption growth

What do we know about growth in SSA?

- ▶ Jerven (2012) and Devarajan (2013) speak of “Africa’s statistical tragedy”
 - ▶ National Accounts are in disarray.
 - ▶ Price levels are outdated. Agricultural surveys missing.
 - ▶ Population censuses are out of date, etc.
 - ▶ Structural adjustment wreaked havoc on statistical capacity.
- ▶ Young (2012) goes further
 - ▶ PWT 6.1 provided GDP for 45 SSA countries, for 24 there was no price level study.
 - ▶ In 2006, UN reported GDP data for 47 SSA countries from 1991 to 2004.
 - ▶ By mid-2006, UN had received only half the data, 15 countries had not delivered constant price data although the UN reported a full time series online.

57 / 65

Estimating consumption

- ▶ National Accounts estimates of consumption in SSA
 - ▶ typically estimated as a residual.
 - ▶ compile GDP on the production side, subtract all other known components, left with consumption.
 - ▶ informal production is often not available
- ▶ Estimated with household surveys
 - ▶ Undertaken infrequently
 - ▶ Subject to non-response and over/under-reporting biases
 - ▶ Survey methods vary and introduce measurement error
- ▶ Large debate on the discrepancy between the two measures
- ▶ Can we do something different?

58 / 65

The African growth miracle

Young (2012, JPE) paper

- ▶ Proposes to translate asset trends into consumption growth
- ▶ Uses 135 DHS surveys for 29 SSA and 27 other developing countries from 1980 to 2006
- ▶ Takes a broad (multidimensional) notion of consumption
 - ▶ Ownership of durables
 - ▶ Housing conditions
 - ▶ Children's nutrition and health
 - ▶ Household time and family economics
- ▶ Uses education Engel curves to arrive at real consumption
 - ▶ Education and income are related
 - ▶ Education and asset ownership are related
 - ▶ Loads of tricky details in the paper

59 / 65

The baseline, like DHS sample 1980–2006

ESTIMATES OF THE GROWTH AND STANDARD DEVIATION OF LIVING STANDARDS:
PENN WORLD TABLE AND UN NATIONAL ACCOUNTS

$$y_{ct} = a + g_{-A} \times t + g_A \times t + u_c + v_c \times t + e_{ct}$$

	PENN WORLD TABLES 7.0 PRIVATE CONSUMPTION		UN NATIONAL ACCOUNTS PRIVATE CONSUMPTION: PER CAPITA (3)
	Per Capita (1)	Per Equivalent Adult (2)	
g_{-A}	.022 (.004)	.020 (.004)	.022 (.004)
g_A	.011 (.003)	.011 (.003)	.009 (.003)
$\sigma[u_c]$	.818 (.078)	.790 (.075)	.710 (.068)
$\sigma[v_c]$	.010 (.003)	.010 (.003)	.011 (.003)
$\sigma[e_{ct}]$	.084 (.010)	.083 (.009)	.080 (.009)

NOTE.—The u term represents random effects allowing for variation in country and country levels, the v term represents random variation in country growth rates, and e represents the error term. The subscripts denote the index across which the random shock or error applies (e.g., v_c is random variation in country growth) allowed in table 7. These regressions do not include the random product level and growth variation allowed in table 7 because the dependent variable is a national GDP aggregate. The term $\sigma[\cdot]$ represents the estimated standard deviation of the relevant random effect or error. PWT uses PPP measures of real consumption and the UN measures are in constant market exchange US dollars with ad hoc PPP adjustments (see n. 26 in the text). PWT calculates equivalent adults by assigning a weight of .5 to persons under 15.

60 / 65

An African growth miracle!

ESTIMATES OF THE GROWTH AND STANDARD DEVIATION OF LIVING STANDARDS: DHS PRODUCTS

$$y_{pct} = a_p + g_{-A} \times t + g_A \times t + u_c + v_p \times t + v_c \times t + u_{pc} + e_{pct}$$

	All Products (1)	Consumer Durables (2)	Housing (3)	Health (4)	Family Economics (5)
g_{-A}	.038 (.006)	.046 (.010)	.038 (.011)	.033 (.006)	.031 (.006)
g_A	.034 (.005)	.056 (.010)	.018 (.011)	.034 (.006)	.025 (.006)
$\sigma[u_c]$	.713 (.072)	.742 (.090)	1.08 (.123)	.578 (.068)	.592 (.071)
$\sigma[v_p]$	.019 (.003)	.024 (.007)	.017 (.006)	.006 (.005)	.010 (.005)
$\sigma[v_c]$	.015 (.002)	.016 (.004)	.027 (.005)	.013 (.005)	.013 (.003)
$\sigma[u_{pc}]$	.872 (.020)	.968 (.042)	1.01 (.053)	.504 (.030)	.765 (.036)
$\sigma[e_{pct}]$	.241 (.006)	.221 (.009)	.252 (.014)	.273 (.018)	.206 (.010)

NOTE.—The u terms represent random effects allowing for variation in country and country \times product levels, the v terms represent random variation in country and product growth rates, and e represents the error term. The subscripts denote the index across which the random shock or error applies (e.g., v_c is random variation in country growth). The term $\sigma[\cdot]$ represents the estimated standard deviation of the relevant random effect or error. These measures incorporate the first-step covariance matrix into the likelihood, as discussed earlier.

- ▶ $g_A = 3.4\%$ p.a., 3.5 times larger than National Accounts estimates! Hence, the title “The African growth miracle”.

61 / 65

An African growth miracle?!

- ▶ Harttgen, Klasen and Vollmer (2013) identify four problems:
 1. Preferences for certain assets might rise over time as assets become more prevalent and part of “normal” living conditions (e.g., TVs and mobile phones).
 2. Changing relative prices can lead to a demand shift favoring some assets at the expense of other household expenditures.
 3. Assets are *stocks* not *flows*. It is problematic to proxy a flow (consumption) with a stock (asset ownership).
 4. The provision of some assets (such as access to piped water and electricity) are in many poor countries a result of specific government policies. They are not reliable proxy measures for actual household consumption.
- ▶ Third point is the biggest problem, HKV show that there is “asset drift”.

62 / 65

No African growth miracle

REGRESSION RESULTS

Variables	(1) Asset Index Growth	(2) Asset Index Growth	(3) Asset Index Growth	(4) Asset Index Growth
Consumption p. c. growth	0.00255 (0.0989)	-0.324 (0.301)	0.00674 (0.102)	-0.349 (0.313)
Sub-Sahara Africa (= 1)		-0.00492 (0.0119)		-0.00205 (0.0147)
Growth rate Sub-Saharan Africa		0.364 (0.319)		0.380 (0.326)
Asset index			-0.000390 (0.00160)	0.000825 (0.00239)
Constant	0.0171*** (0.00504)	0.0227** (0.0101)	0.0193* (0.0103)	0.0165 (0.0206)
Observations	42	42	42	42
R-squared	0.000	0.039	0.002	0.043

Notes: Standard errors in parentheses, ***p < 0.01, **p < 0.05, *p < 0.1.

Source: Demographic and Health Surveys; calculation by the authors.

- ▶ Consumption growth from national accounts and asset growth are not correlated!
- ▶ Only the constants are significant, people accumulate assets in the absence of consumption growth (asset drift).

63 / 65

Implications for multidimensional poverty

- ▶ Multidimensional measures consider poverty as a *stock* phenomenon, monetary measures are *flows*.
- ▶ Deprivations indices are *inverse* and *censored* asset indices.
- ▶ Changes in multidimensional poverty are thus changes in stocks, which are affected by
 - ▶ changing preferences,
 - ▶ government policies, and
 - ▶ unaccounted for depreciation and disposal rates.
- ▶ This is *not necessarily* a problem, but we should be clear that indices like the MPI have *very little* to do with consumption.
- ▶ On the plus side, asset ownership in SSA has increased and thus multidimensional poverty has most likely decreased.

64 / 65

Wrap up session I

The main take aways:

1. Global poverty levels (and the extreme poverty line) are uncertain, but trends are more robust.
2. Past progress was rapid due to rapid growth in China and moderate growth in South Asia. Progress in Sub-Saharan Africa has been slow.
3. Inequality within developing countries has been rising.
4. Changing composition of the world's poor has huge implications going forward.
5. Extreme poverty is unlikely to end in 2030.
6. Stocks \neq flows, asset indices \neq consumption, and consumption poverty \neq multidimensional poverty.