



Evolution of Knowledge on Poverty and Inequality

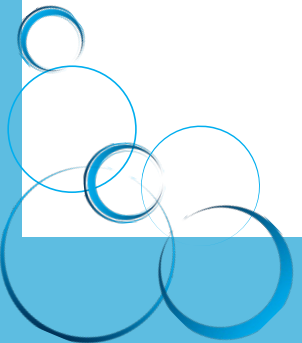
Emanuela Galasso (Development Research Group) and Christoph Lakner
(Data Group)

Connecting the past, present, and future

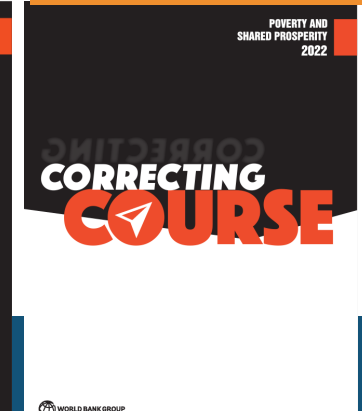
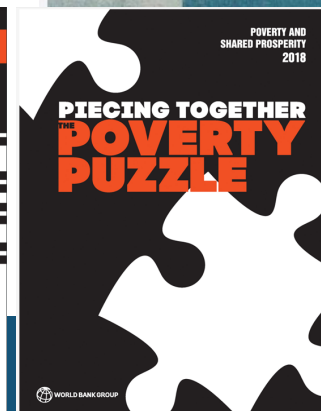
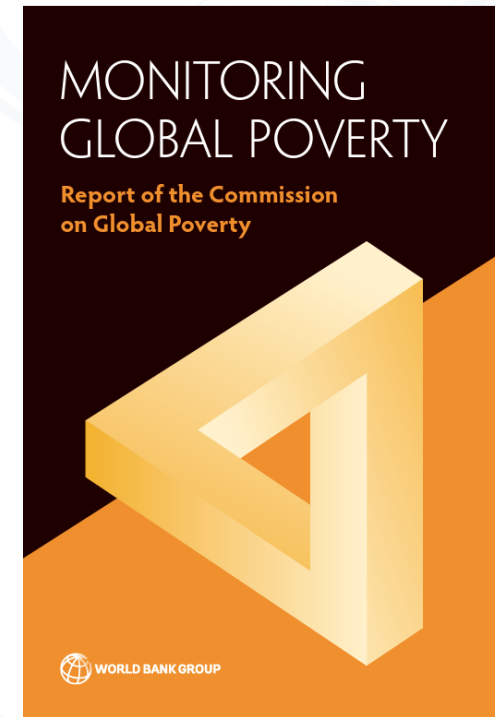
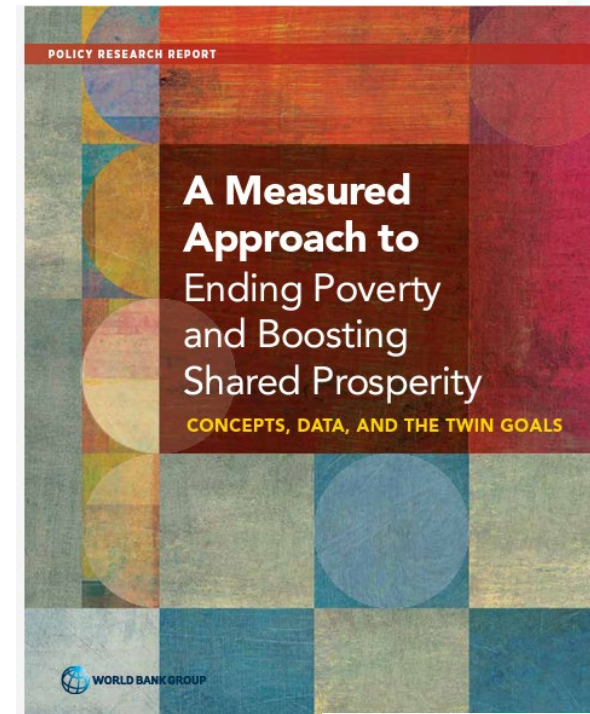
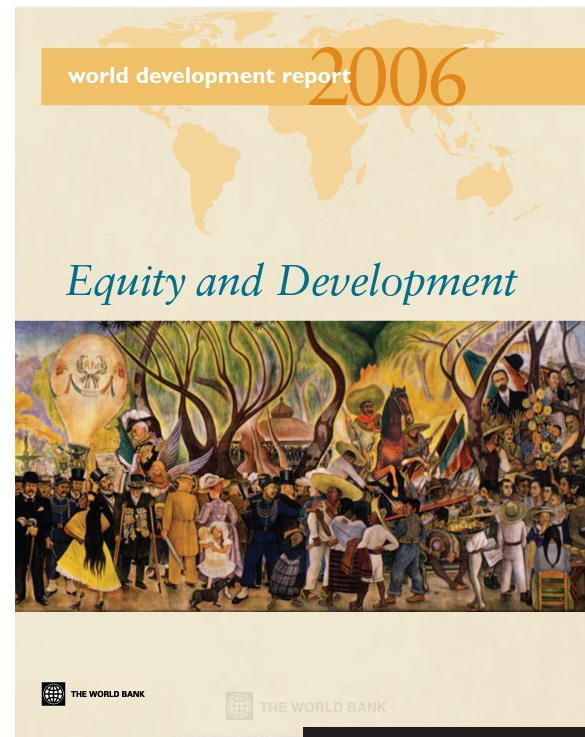
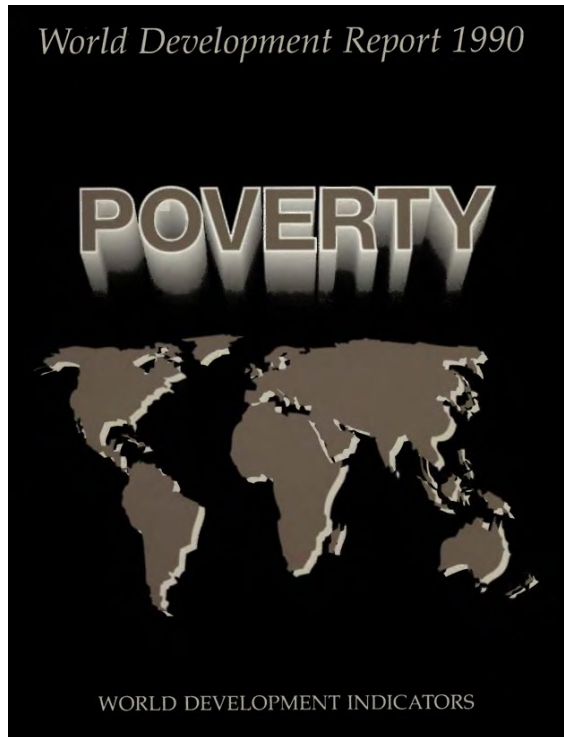




The evolution of the World Bank poverty measurement: from past to present



Landmark flagship reports



Overview

1. The International Poverty Line over time
2. Trends in global poverty and inequality
3. The Atkinson Commission: 21 recommendations for improving the World Bank's poverty measures
4. Unresolved challenges

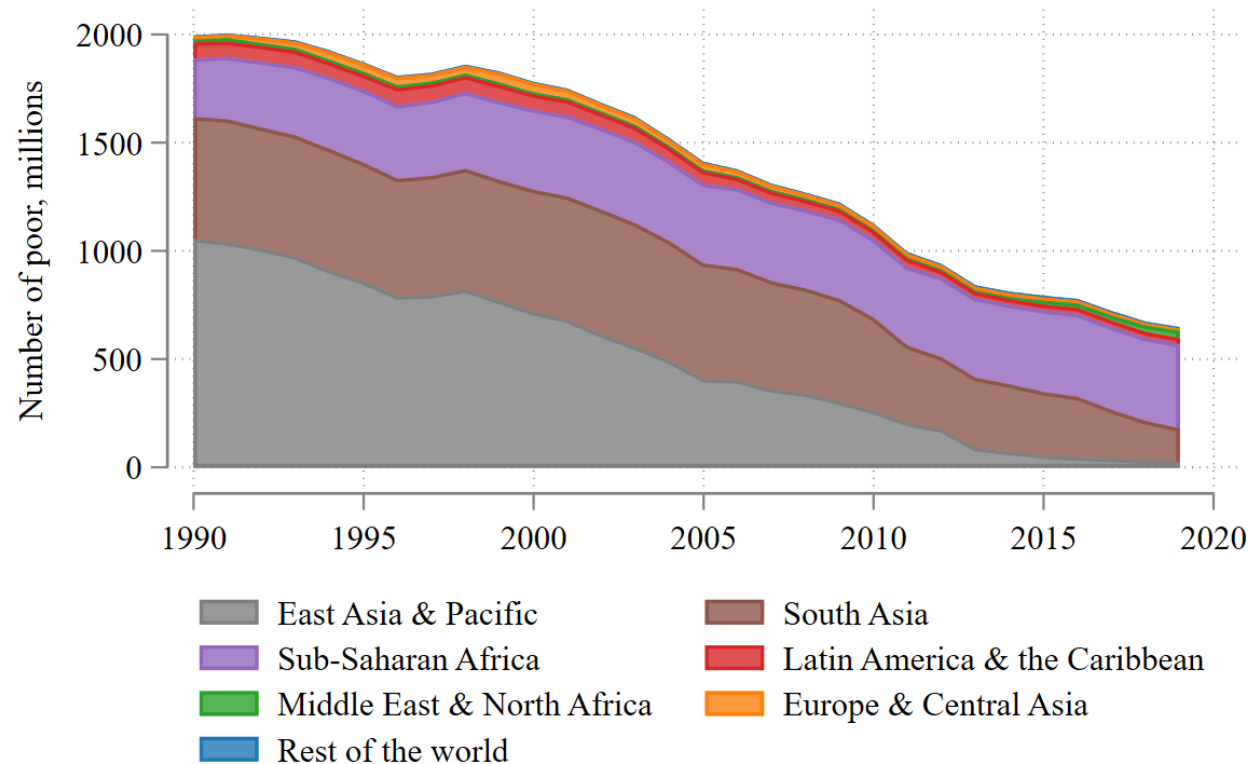
1. History of the International Poverty Line

Since the introduction of the 'dollar-a-day' line, the international poverty line has reflected the typical national poverty line of some of the poorest countries in the world.

Source	World Bank (1990)	Chen and Ravallion (2001)	Ravallion et al. (2009)	Ferreira et al. (2016)	Jolliffe al. (2022)
ICP Data (PPPs)	1985	1993	2005	2011	2017
Method	Inspection (rounded)	Median	Mean	Mean (rounded)	Median
Poverty line (ICP base year USD)	\$1.01 (\$1.00) "Dollar-a-day"	\$1.08	\$1.25	\$1.88 (\$1.90)	\$2.15
Countries used in sample	Bangladesh, Indonesia, Kenya, Morocco, Nepal, Pakistan, Philippines, Tanzania	Bangladesh, China, India, Indonesia, Nepal, Pakistan, Tanzania, Thailand, Tunisia, Zambia	Chad, Ethiopia, The Gambia, Ghana, Guinea- Bissau, Malawi, Mali, Mozambique, Nepal, Niger, Rwanda, Sierra Leone, Tajikistan, Tanzania, Uganda	Same as RCS (2009) (15 countries)	28 low-income countries

Source: Adapted from Ferreira et al. (2016).

2. Global extreme poverty

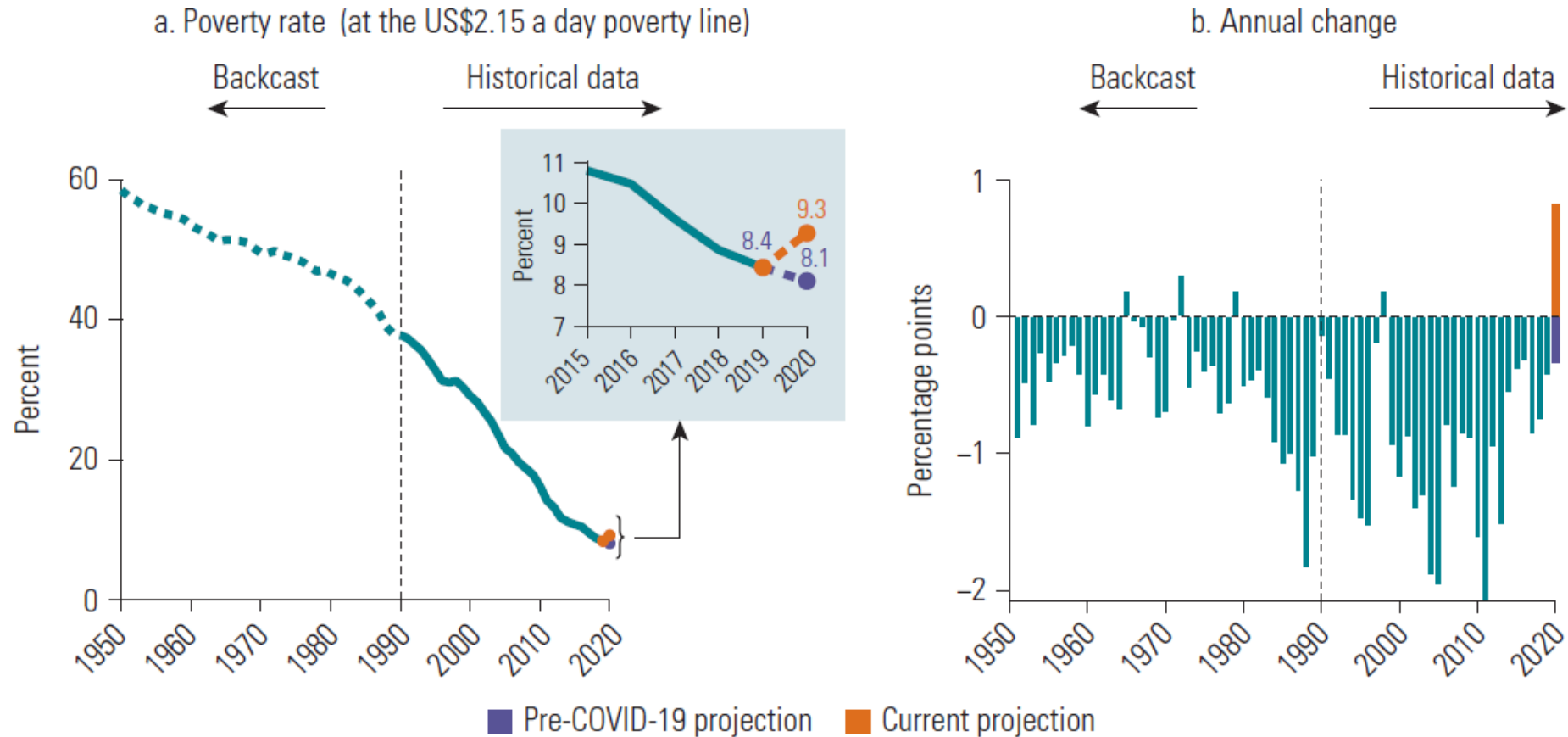


Source: Poverty and Inequality Platform, <https://pip.worldbank.org/>.

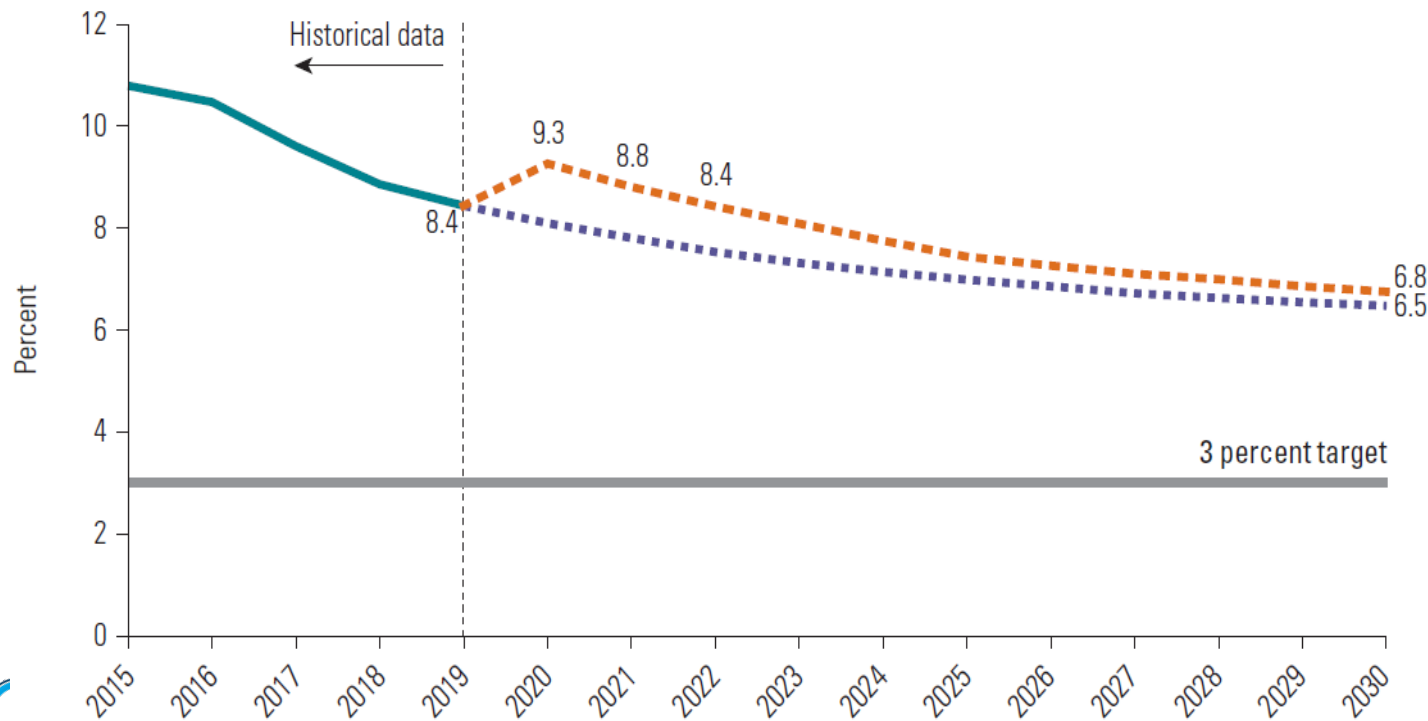
Note: The estimates are based in 2017 PPP but are available in 2011 PPP in PIP.

- Global extreme poverty—i.e., those living below \$2.15 a day—has continuously fallen in the last three decades from close to 2 billion in 1990 to 648 million in 2019.
- 38 percent of the global population lived in extreme poverty in 1990, while 8.4 percent lived in poverty in 2019.
- However, the rate of poverty decline has slowed from 1.4 percentage points annually from 2008-14 to 0.6 percentage points from 2014-19.

Poverty increased for the first time in over two decades in 2020. Possibly the largest increase since WWII.

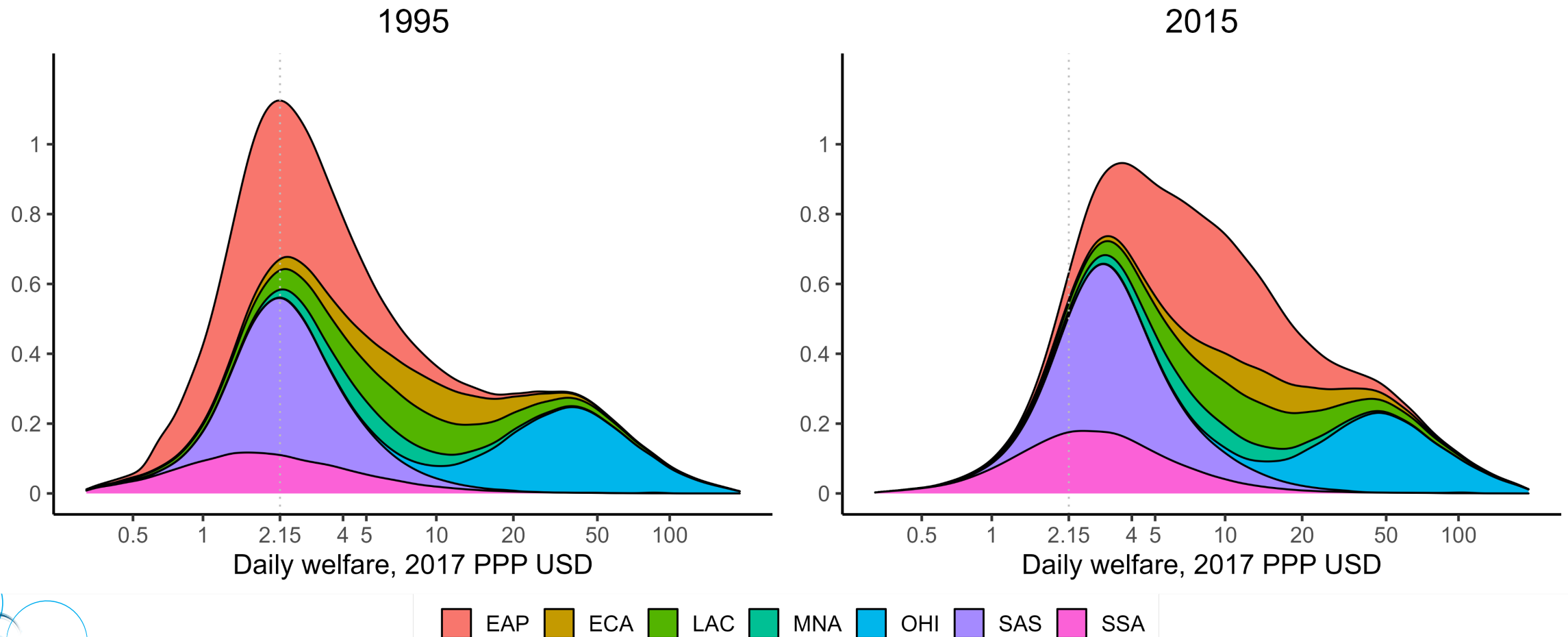


World Bank and SDG Poverty Goals for 2030



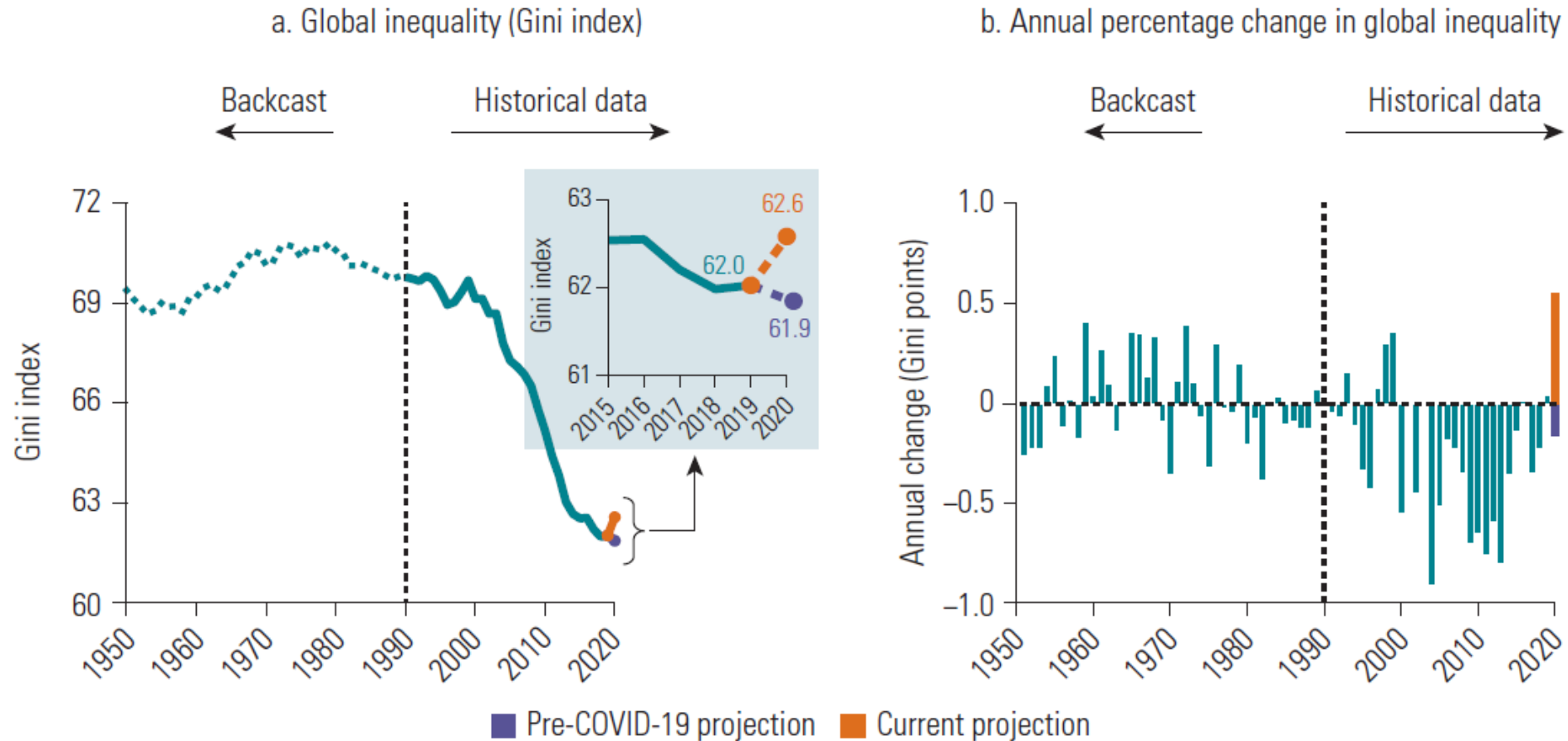
- The SDG goals call for the eradication of extreme poverty by 2030. The World Bank has a goal of reducing extreme poverty to 3% by 2030.
- Projections from the Poverty and Shared Prosperity report in 2022 informed us that we will not reach the 3% goal. Forecasts then informed that global extreme poverty in 2030 would have been 6.5% without the pandemic and 6.8% because of the pandemic.
- SSA will be the region with the most poor. Countries in this region will most likely need to grow at more than 8 times their historical average annual growth (2010-2019) for global extreme poverty to decline to 3%.

2. Inequality: The changing shape of the global income distribution

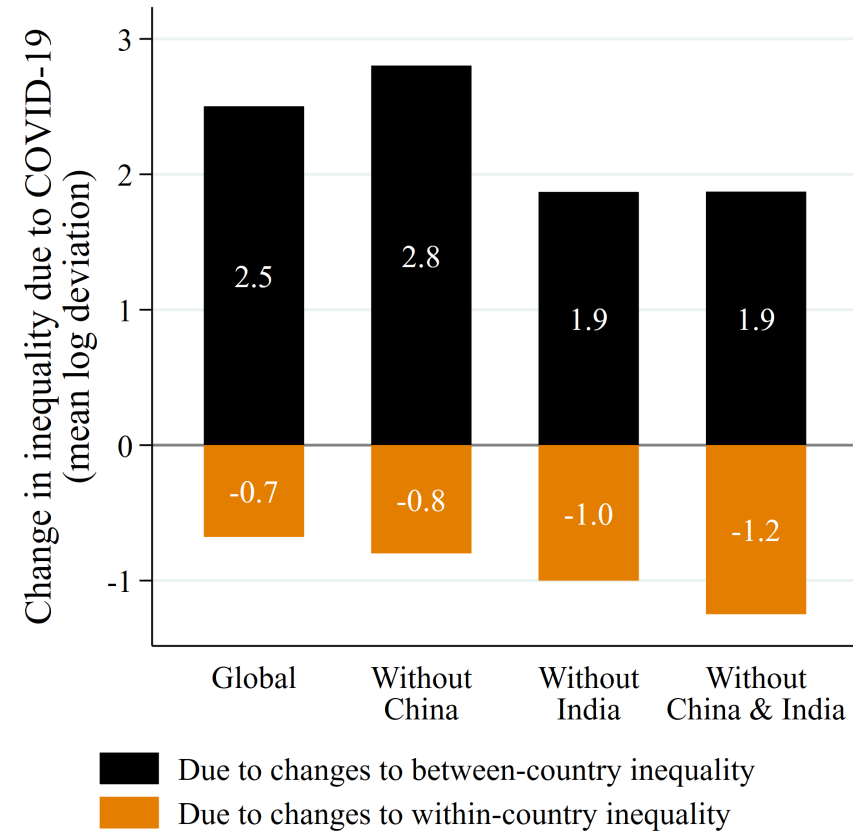
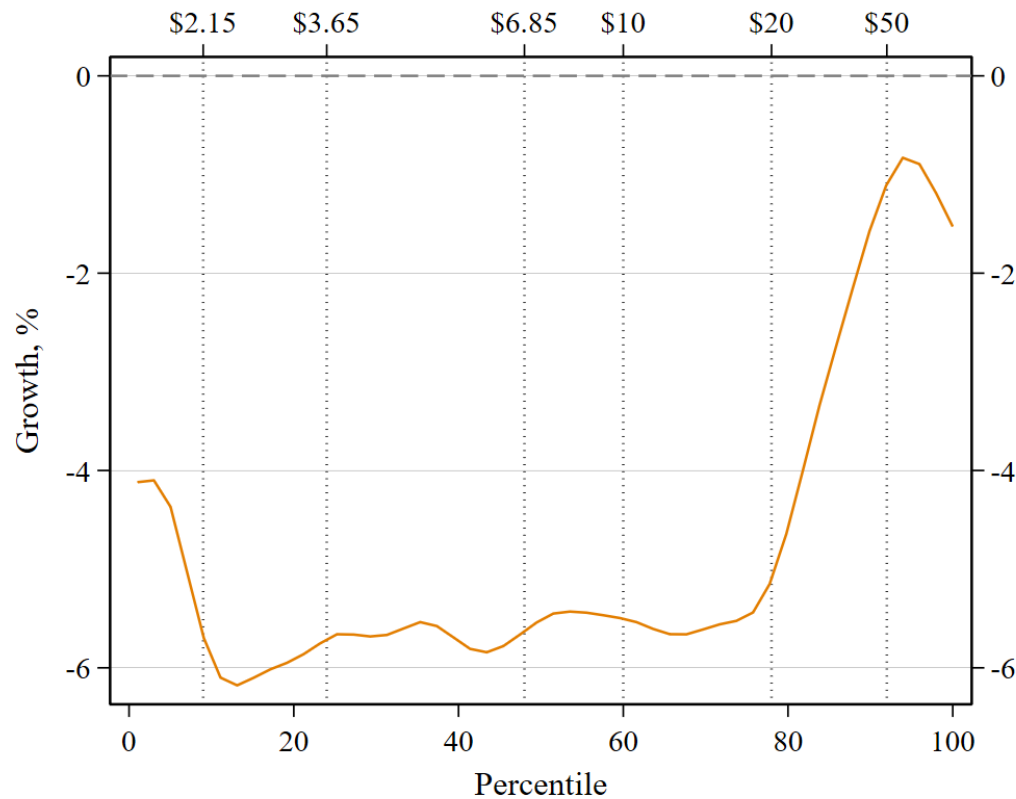


Source: Poverty and Inequality Platform, <https://pip.worldbank.org/>.

After a decline over the last two decades, global inequality increased due to the pandemic.



The global growth incidence curve shows the net effect of COVID-19, which was driven mostly by the increase in inequality *between* countries.



3. The Atkinson Commission on Global Poverty

The 24-member commission led by Prof. Anthony Atkinson was tasked with providing advice to the World Bank's Chief Economist on:

- (A) What should be the interpretation going forward of the definition of extreme poverty, set in 2015 at 1.90 Purchasing Power Parity (PPP)-adjusted dollars a day per person, in real terms?
- (B) What choices should the World Bank make regarding complementary poverty measures to be tracked and made available to policy-makers?

The final report was published in October 2016, and contains 21 recommendations.

Purchasing Power Parities after 2011

- Recommendation #10: Global poverty estimates should not be revised in the light of new rounds of the ICP until 2030.
- The World Bank responded that “[...] we plan to follow this recommendation but leave open the possibility that future PPP rounds might be used again to inform the construction of the international poverty line, even before 2030, if and only if we are satisfied that the ICP methods have substantially stabilized over at least two ICP rounds.”
- In 2022, the World Bank adopted the 2017 PPPs in its global poverty measures, revising the international poverty line from \$1.90 (2011 PPPs) to \$2.15 (2017 PPPs):
 - Methods used to calculate PPPs have been stable between 2011 and 2017 PPPs.
 - Uses the most recent and high-quality price data for global poverty monitoring.
 - Impact on global poverty estimate a lot smaller now than in previous rounds.
- Estimates using 2011 PPPs continue to be available.

Societal Poverty (A): Income-class poverty lines

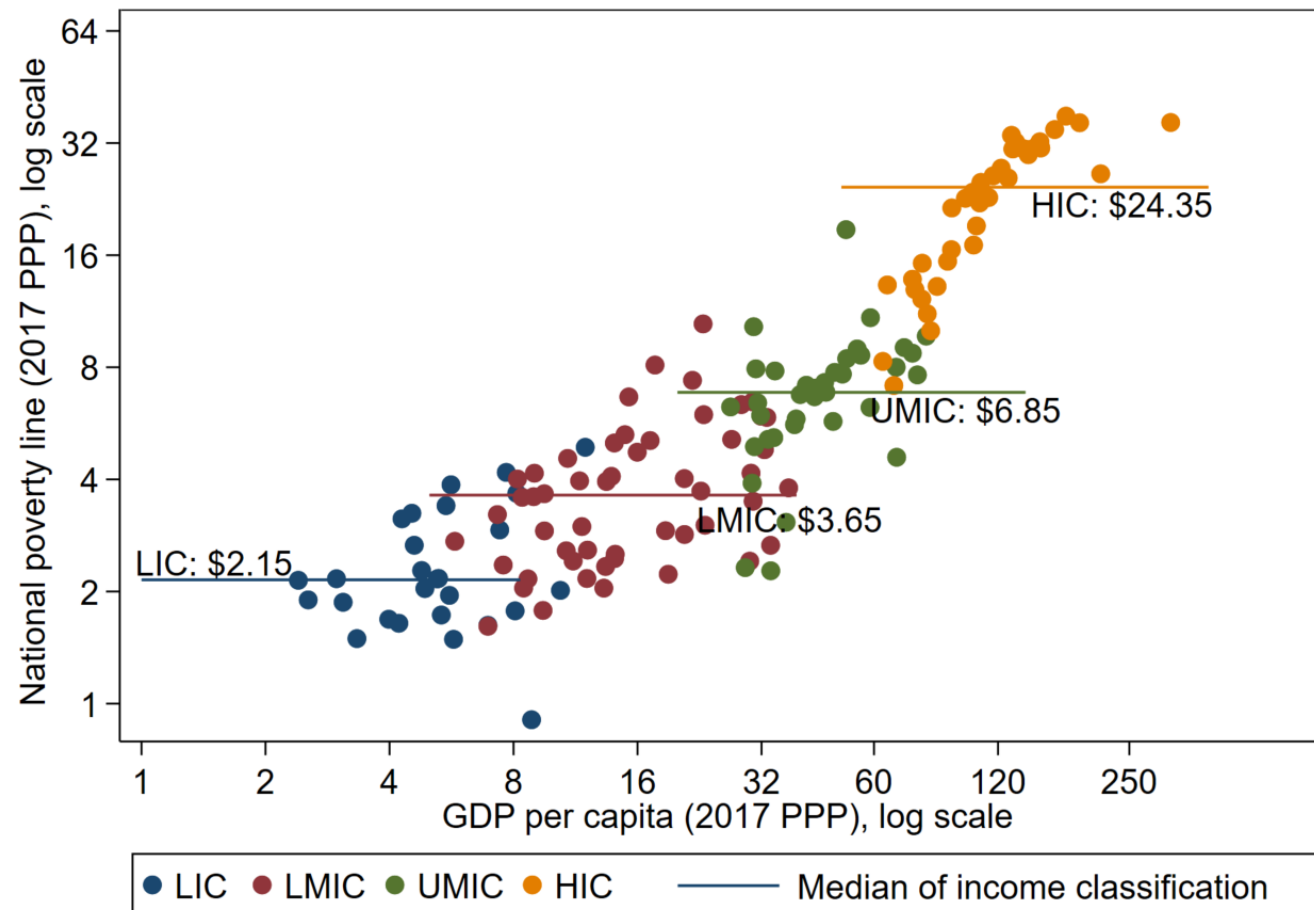
Rationale

A country's national poverty line reflects its societal notion of poverty, which is in turn related to its level of development.

Approach

Anchored on national poverty lines.

- Low-income: \$2.15/day
- Lower-middle: \$3.65/day
- Upper-middle: \$6.85/day



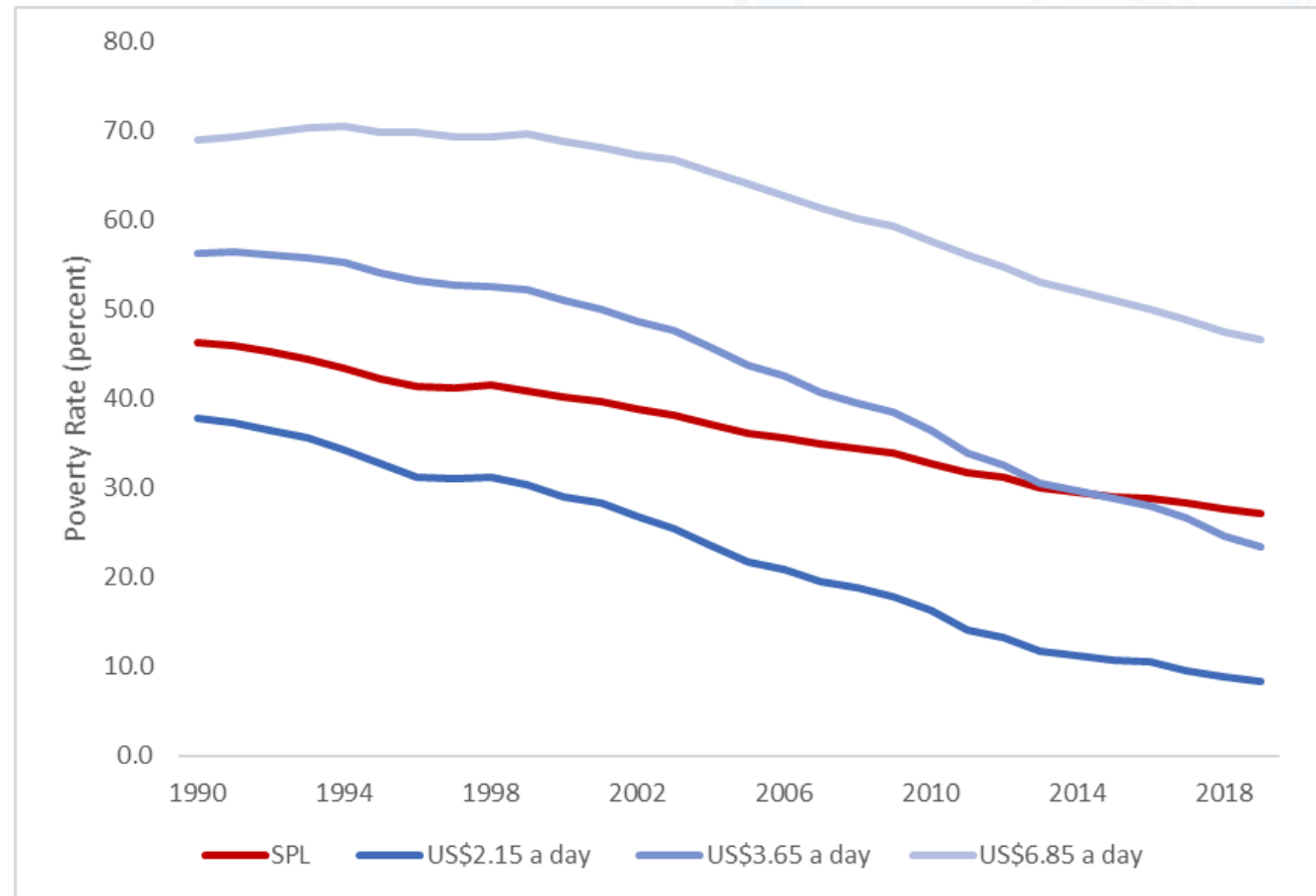
Societal Poverty (B): A societal global poverty line

Weakly relative poverty line is based on the best fit on a database of *national* harmonized poverty lines (Jolliffe and Prydz, 2016).

Jolliffe and Prydz (2021) estimate the SPL which is identical to IPL for countries below a certain threshold of median per capita income, and rising with median income above that threshold.

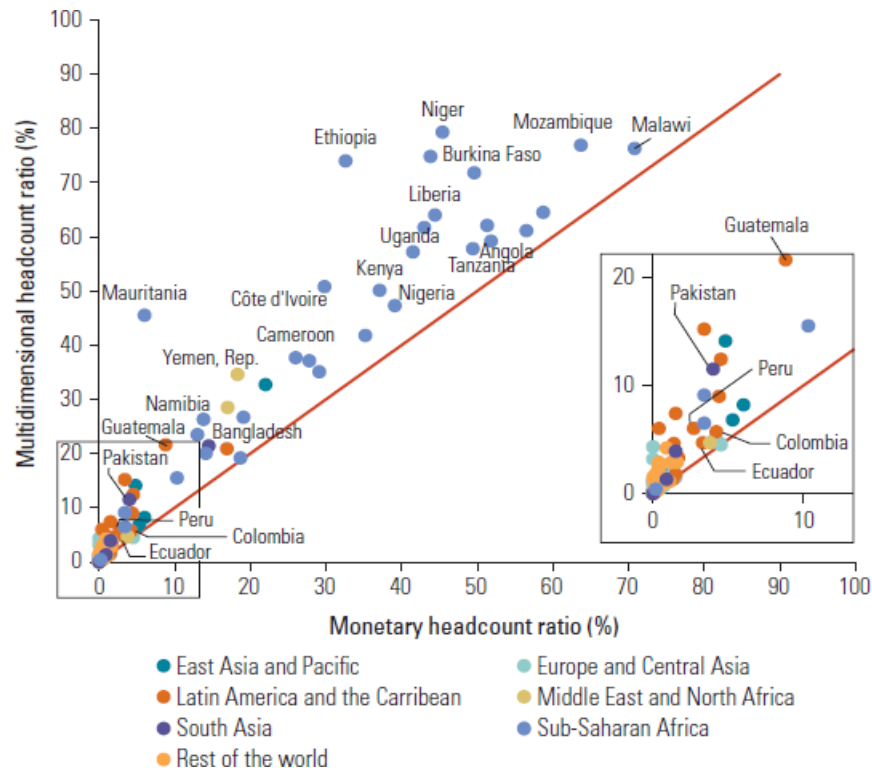
Jolliffe (r) al (2022) update with the 2017 PPPs:

$$\text{SPL} = \max(\$2.15, \$1.15 + 0.5 * \text{median})$$



Closely related to earlier work by Atkinson and Bourguignon (2001) and Ravallion and Chen (2011)

Current approach to multi-dimensional poverty

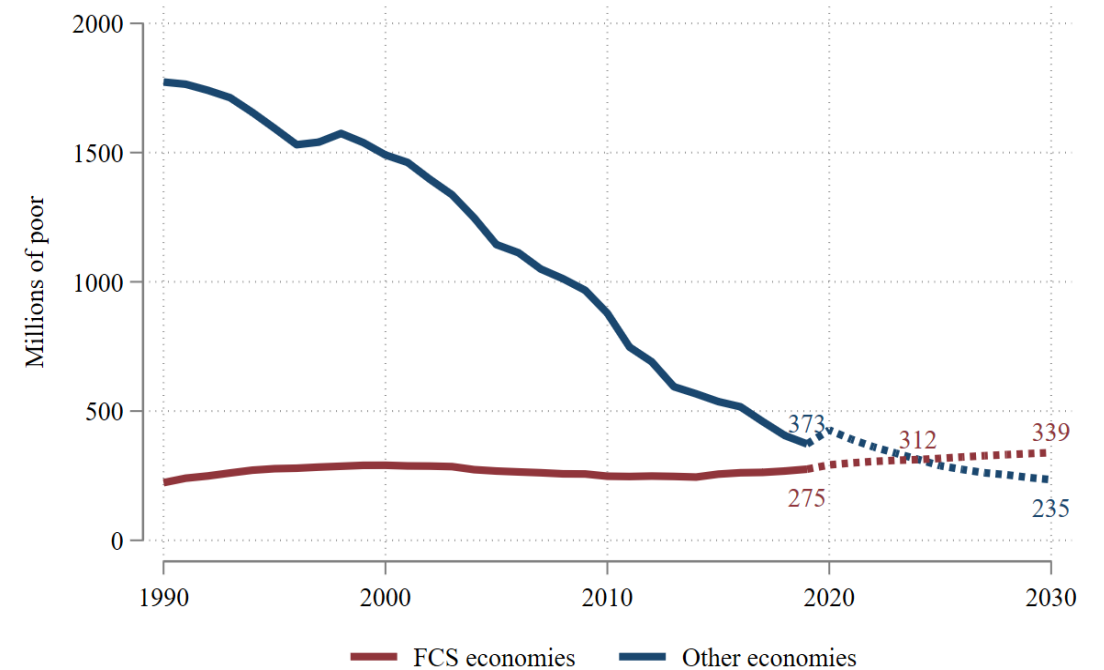
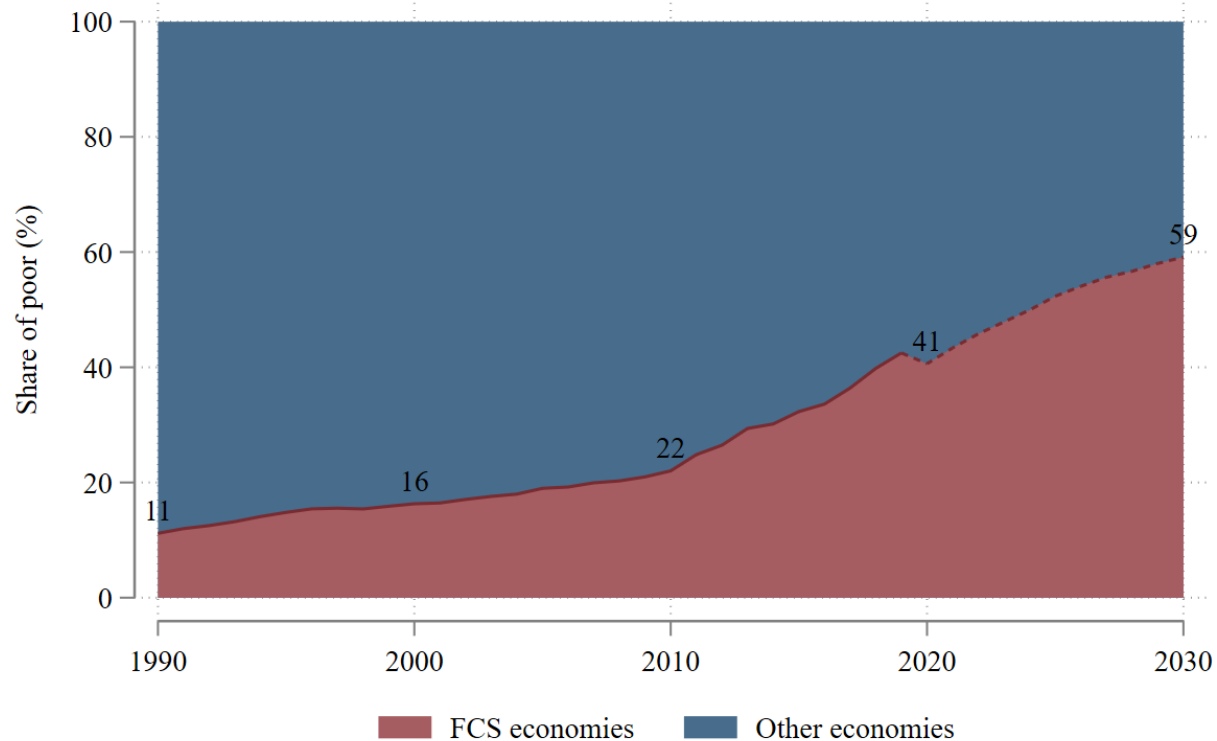


- Recommendation #19 called for a multidimensional poverty indicator
- The measure includes 1/3rd weight each
 - (a) monetary poverty,
 - (b) education—enrollment and completion,
 - (c) access to basic infrastructure (drinking water, sanitation, and electricity)
- An individual is considered poor if she is deprived in 1/3 of the indicators.

Unresolved challenges: Existing measures

- I. Data gaps: Lack of coverage in MENA and East/South Africa. Private data used in India. Going forward, timely, high-quality data collection in Sub-Saharan Africa and fragile and conflict-affected situations will be key.
- II. Consumption vs. Income: Global poverty measures mix income (LAC and rich countries) and consumption (everywhere else).
 - Can we make them more comparable?
 - Should countries transition away from consumption as they develop?
 - Is there a trade-off between accurately capturing the poorest vs. the rest of the distribution?
- III. Communicate uncertainty in the global poverty counts: Atkinson recommendation 5 called for a total error including sampling and non-sampling errors.

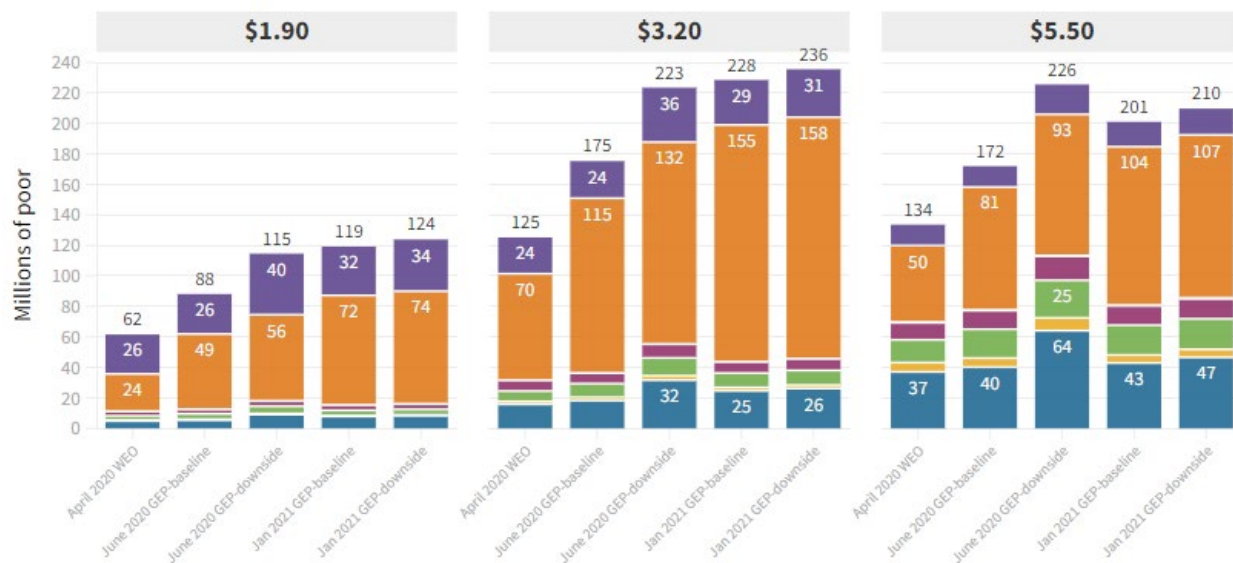
Poverty is expected to be concentrated in economies that are fragile, conflict-prone, and in violence, which is also where we have data gaps



Nowcasting: How to make poverty measures more timely while also signaling uncertainty?

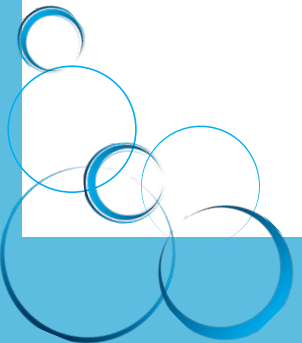
Net additional poor in 2020 due to COVID-19 pandemic

■ East Asia & Pacific ■ Europe & Central Asia ■ Latin America & Caribbean ■ Middle East & North Africa ■ Rest of the world
■ South Asia ■ Sub-Saharan Africa



- We reported nowcasts every 4-6 months through 2020 and 2021.
- There were large uncertainties around growth forecasts, which is the crucial input into nowcasting poverty and, hence, large changes in the estimated number of additional poor.
- Mahler et al. (2022) show that GDP growth performs nearly as well as using 1000+ variables.

The Present: Ongoing/Planned Research on Measurement and Methods



Overview

1. Towards a broader conception and measurement of welfare
 - Multidimensional poverty
 - Trade-offs across dimensions (theory and measurement)
 - Broadening the constructs through surveys and qualitative work
 - Looking within the household
2. Methods:
 - Use of prediction methods in data-scarce environments
 - Use ML methods to do qualitative work at scale

Multidimensional Poverty: Making better trade-offs between wellbeing dimensions

- Poverty and mortality are the 2 main sources of well-being losses (globally)
- Mutually exclusive dimensions
- Making trade-offs requires aggregation
 - RichLand: 5% poverty, 60 years life-expectancy
 - Lifeland: 15% poverty, 68 years life-expectancy
- Preference-based approach requires a life-cycle perspective
 - Mortality : mortality reduces # years of life
 - Poverty: poverty increases # years spent in poverty
 - Aggregation units must be “# years of life”, to be consistent

Multidimensional Poverty: Making better trade-offs between wellbeing dimensions

- Expected life-cycle utility → Poverty-adjusted life-expectancy

$$PALE_{\theta} = LE * (1 - \theta * H)$$

- LE is life-expectancy, H is poverty headcount
- Normative $\theta \in (0,1)$: fraction of period-wellbeing lost when a non-poor becomes poor.
- Comparisons of $PALE_{\theta}$ can be robust to $\theta \in (0,1)$, even when LE and H disagree (when assuming that being poor is worse than being dead)
- Cross-country comparisons in Baland et al (2022) such that
 - LE and H disagree in 21% of all cases
 - For 35% of these 'disagreement cases', comparisons of $PALE_{\theta}$ are robust to $\theta \in (0,1)$.

Multidimensional Poverty: assessing the validity of welfare inference across measures of wellbeing

1. Measures: Uses data on a wide range of standard wellbeing associations in a sample of Peruvian adults

- Stratified Sample drawn from 2018 ENAHO, Peru's living standards survey
- Follow-up three months later with further survey and collection of biometric samples
- *Money-metric*: consumption, income, wealth
- *Bio-metric*: cortisol (saliva, hair), and DHEA (hair)
- *Elicited*: subjective poverty, evaluative (life satisfaction), affect (positive and negative), eudaimonic or psychological needs (autonomy, relatedness, competency, safety), mental health (depression)

2. Whether/how to aggregate different dimensions:

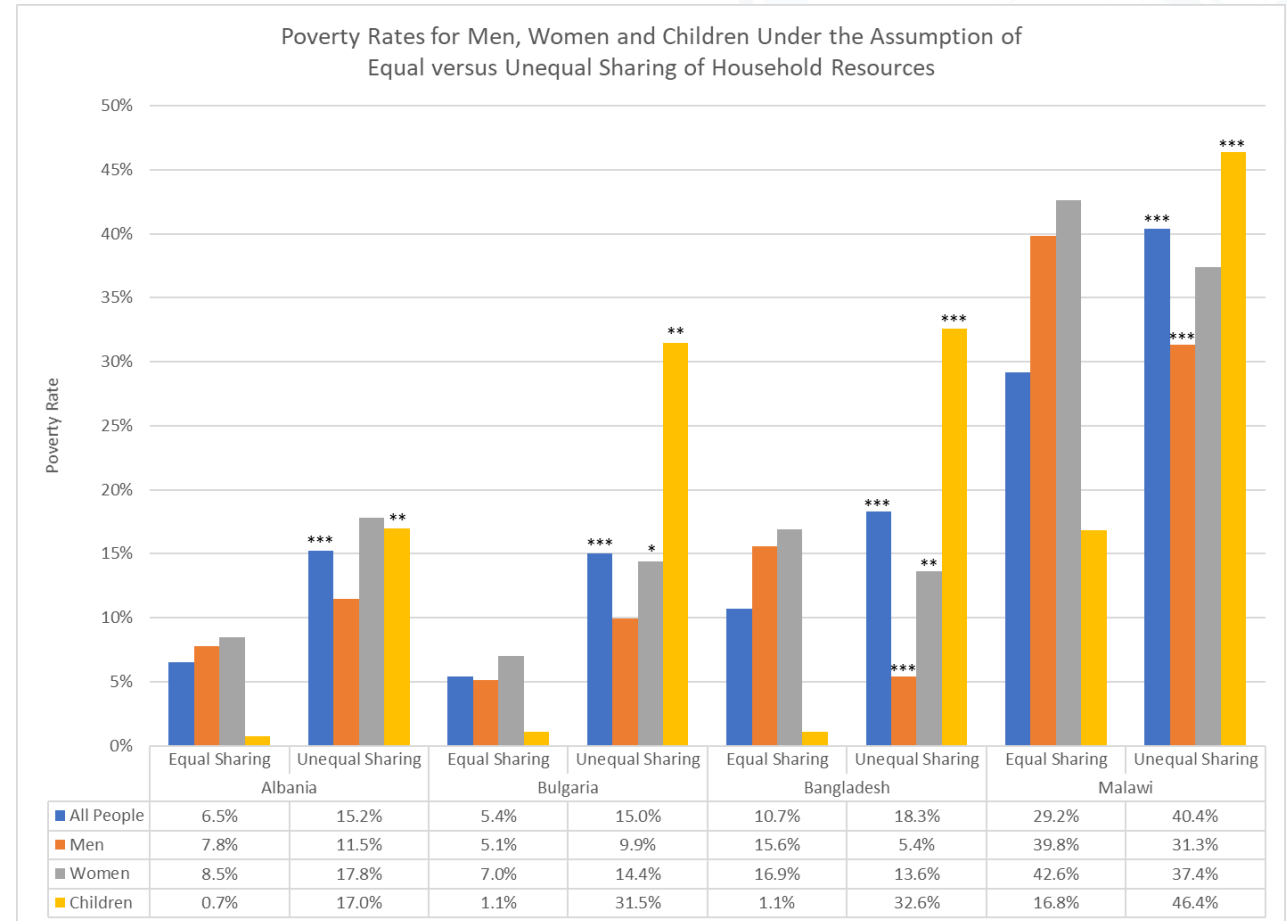
- analyze separately
- or aggregate, but how eliciting stipulated weights, elicited weights, observed marginal trade-offs)?

Multidimensional Poverty: expanding measurement through Qualitative Data Analysis at Scale

- Expanding on measures/constructs through open-ended conversations, eliciting from own experience and reasoning. Rohingya Refugees and Bangladeshi Hosts study:
 - Subjective Well-Being: Eliciting respondents own definition of well-being, how they assess their own living standards derived from these definitions and relating it to more conventional welfare and subjective measures.
 - Extend aspirations: specific “goals” for children, what it means to be a “good person”, & “navigational capacity” – how parents plan to achieve them
- Small scale: High cost of analysis and human coding
 - High quality human coded sample used as a ‘training’ sample
- Moving to large scale: develop supervised ML methods to expand human coded data from a subsample to a corpus from a representative sample
 - Trading off precision in the sample size of training and the size of the large sample

Poverty measurement within the household, to get at “individual poverty”

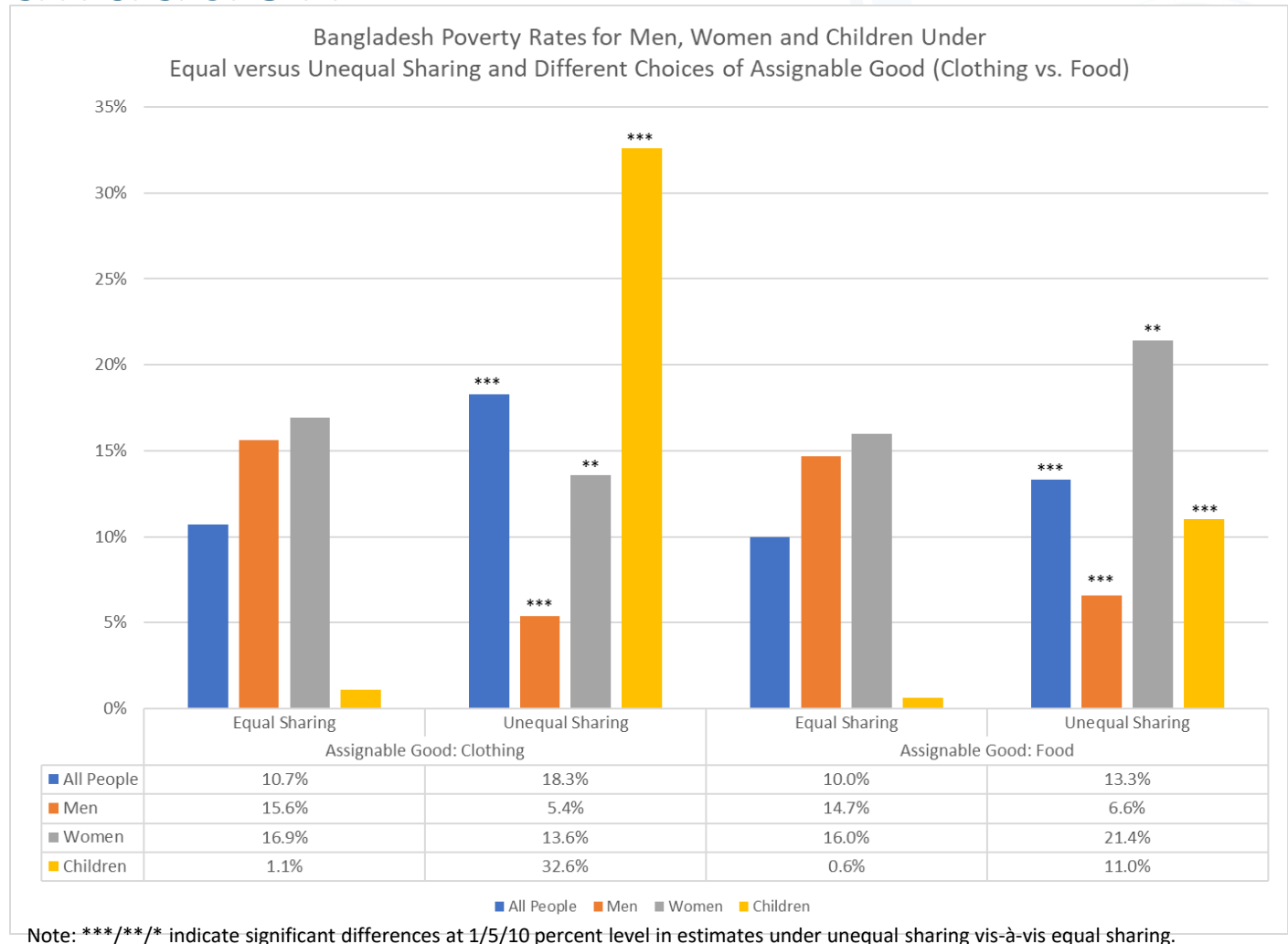
- Currently ignoring intra-household inequality
- Design: Developed a new model to estimate the share of household consumption for each individual and applied to existing household survey data
- Results:
 - Evidence of substantial within-HH consumption inequality
 - Violation equal sharing of resources: underestimation in poverty, and particularly for children, under the assumption of equal sharing of resources
 - Cross-country heterogeneity



Note: ***/**/* indicate significant differences at 1/5/10 percent level in estimates under unequal sharing vis-à-vis equal sharing.

Poverty measurement within the household: follow-up work on model validation

- To be pursued in randomized survey experiments
 - Collect individual-disaggregated consumption data; compute *observed* resources shares and poverty
 - Compare to *predicted* resource shares and poverty rates obtained by applying our model to more aggregate data elicited under survey designs of varying complexity and cost



Methods: Use of prediction methods for poverty measurement in data-scarce environments

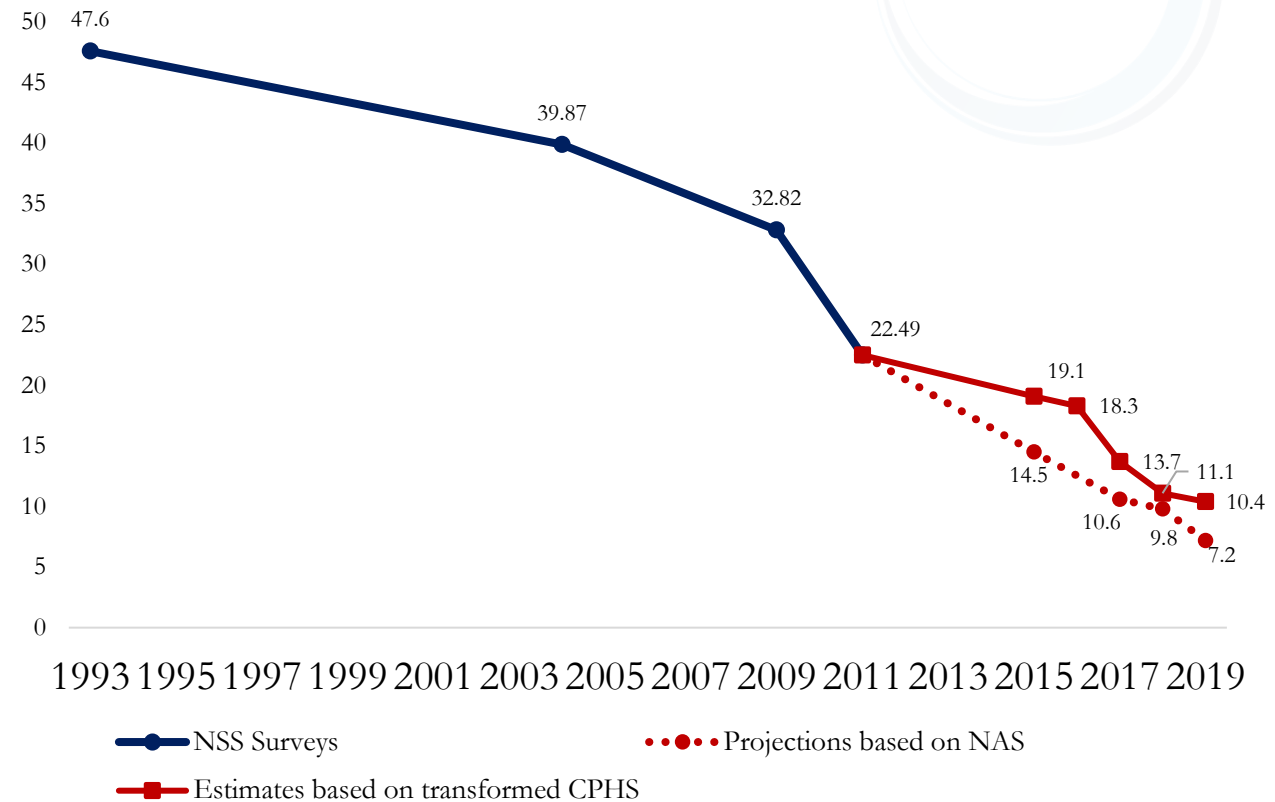
- India: Data gap complicates the monitoring of household welfare in an economy that has undergone significant changes over the last ten years.
 - Latest official household consumption survey released by India in 2011
 - Filling the gap with a household survey collected by the private sector (CPHS) since 2014/15.
 - Under-representation of richest and poorest households in the country
 - Consumption data is not directly comparable to NSS
- Approach: Using method of moments to estimate relationship between CPHS consumption and NSS consumption

$$\log(y_i^{CPHS}) = a + b \log(y_i^{NSS}) + \sigma e_i$$

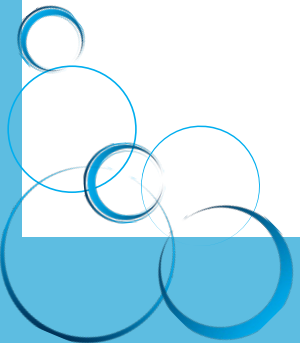
Methods: Use of prediction methods for poverty measurement in data-scarce environments

- The results show that extreme poverty has declined (with greater poverty reductions in rural areas) but not as much as previously thought.
- Other ongoing work:
 - Reliability of poverty maps with survey and remote-sensing data (application to Malawi)
 - Is predicted data is a viable alternative to real data? (financial savings vs statistical precision using data from 16 countries)

The evolution of \$1.90 poverty in India (%)



The Future: Open research questions



Future open questions on measurement:

- Theory:
 - Accounting for interpersonal variation in preferences and implication for welfare measurement
- Measurement/Methods/Data:
 - Reformulating the basic need approach to underpin the societal poverty line (aspirations, agency, security, inclusion)
 - Incorporating big data to make inferences about well-being at lower cost/high frequency, high level of disaggregation

The interplay between measurement and policy

- Conflicting narratives about the inequality and its welfare consequences (Ravallion 2021)
 - Inequality at the bottom: limited progress in raising the consumption floor
 - Distributional issues within/across countries
 - Impact of inequality on growth, mobility, political economy
- How to measure and understand dynamic welfare: mobility within and across generations, inequality of opportunity?
 - Dynamics is crucial for better understand pro-poor market income growth processes and evaluate the impact of pro-poor policies in the short/long term