

Confidence Intervals and Long-Run Trends in Food Prices, the Cost of Basic Needs, and Global Poverty

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Goals

Estimate on the long run:

- the Cost of Basic Needs Global Poverty levels and trends,
- along with its Confidence Interval;
- the trends and levels in Food Prices;
- and the affordability of a healthy diet globally.

Background

- Global measurement of poverty is a relatively recent possibility.
- Data availability did not allow this type of exercises prior to the late 70s.
- Constraints of global price data did not facilitate the adoption of a cost of basic needs based method for measuring global poverty.

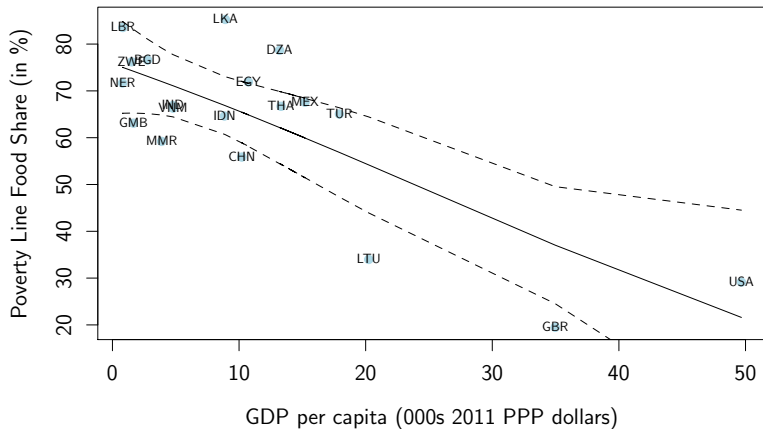
Foreground

- Two new sources of price data have since become available:
 - ICP/World Bank (... , 2005, 2011, 2017, ...)
 - ILO October Inquiry 1924–2008
- These global price sources facilitate the implementation of CBN approaches in global poverty measurement.

Method in brief (1/2)

- In OECD (2021) I used Allen's "basic model" specification to define extreme poverty:
 - that allows for "2,100 calories per day, 50 g of protein, 34 g of fat [...] plus the Indian recommended daily allowances (RDA) of iron, folate, thiamine, niacin, and vitamins C and B12"
- Used the ILO prices (and CPI data) to price those poverty lines for the 1820–2018 period, with Linear Programming
- And estimated global extreme poverty over the very long run using a Cost of Basic Needs approach

Intermezzo: Food share and GDP per capita

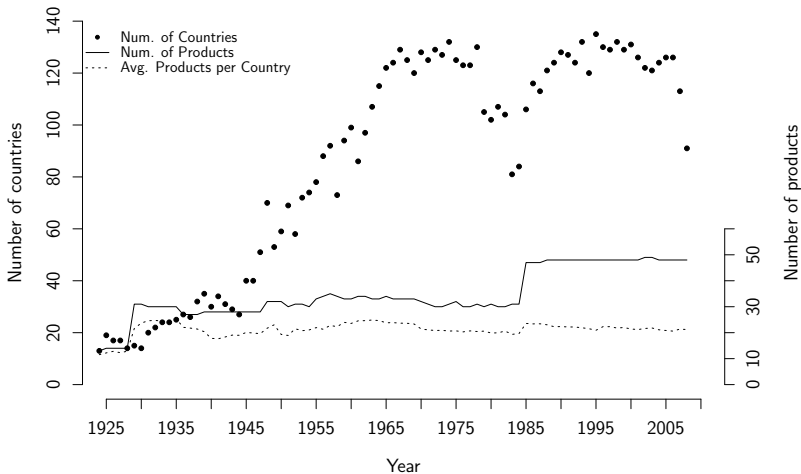


Source: Allen, R. C. (2017). "Absolute poverty: When necessity displaces desire." Am Econ Rev.

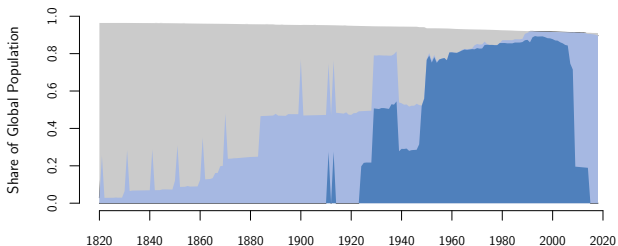
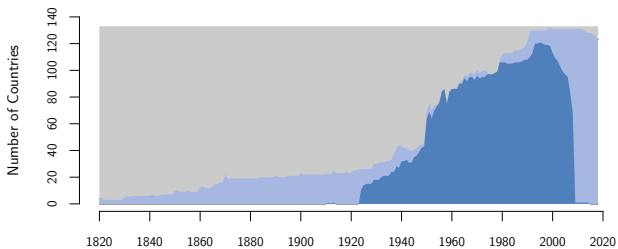
Method in brief (2/2)

- Use that framework , but...
- substituting the food component with the one estimated by Hirvonen, Bai, Headey, & Masters (2020).
- This is done in two steps:
 - ① only using the EAT–Lancet food costs as a “poverty line”, to identify its long run affordability
 - ② add non-food components on top of the EAT–Lancet food costs to deliver CBN poverty lines a la Allen (2017)
- In the above, the ILO food price data are used to estimate a food price index to deflate/inflate the EAT–Lancet diet food component, in order to move it through time.

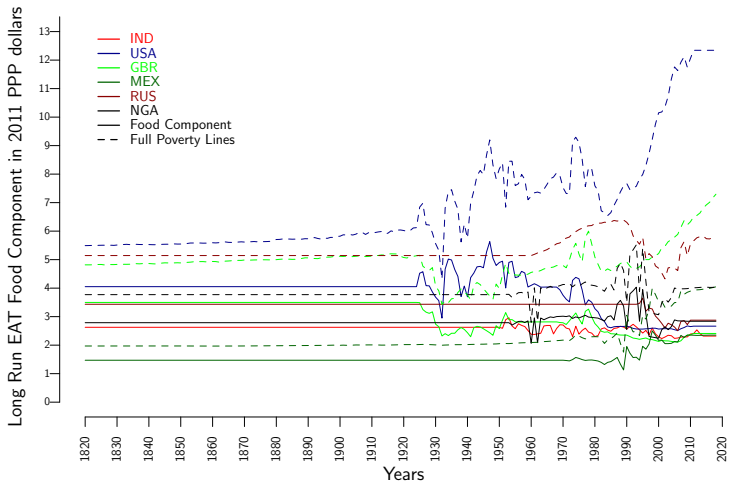
ILO October Inquiry, 1924-2008



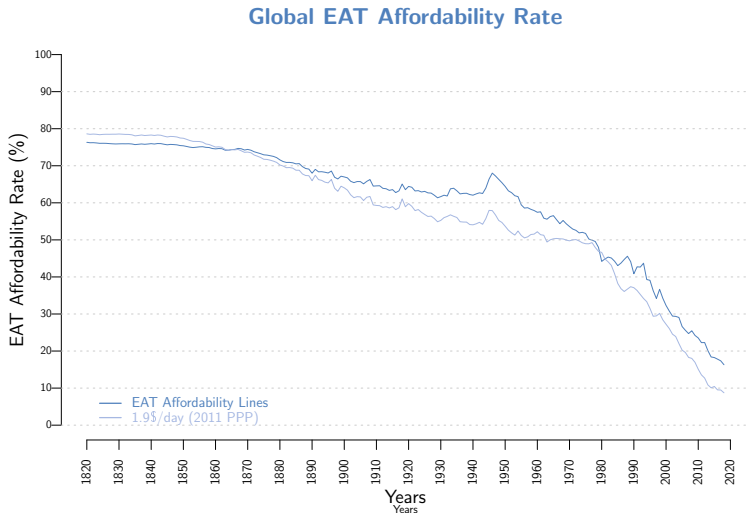
Coverage



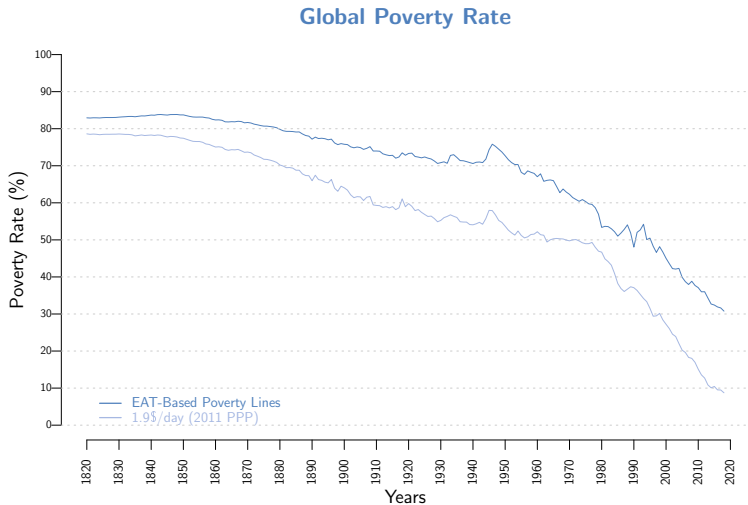
Levels and Trends



EAT–Lancet: Long run global affordability

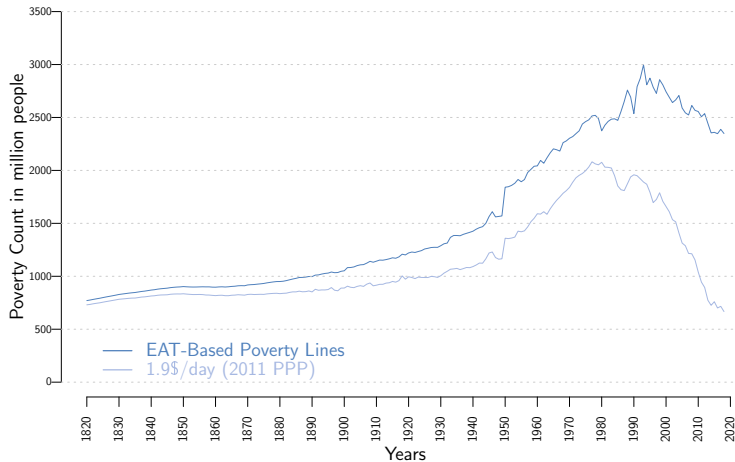


EAT–Lancet: Long run global poverty rate

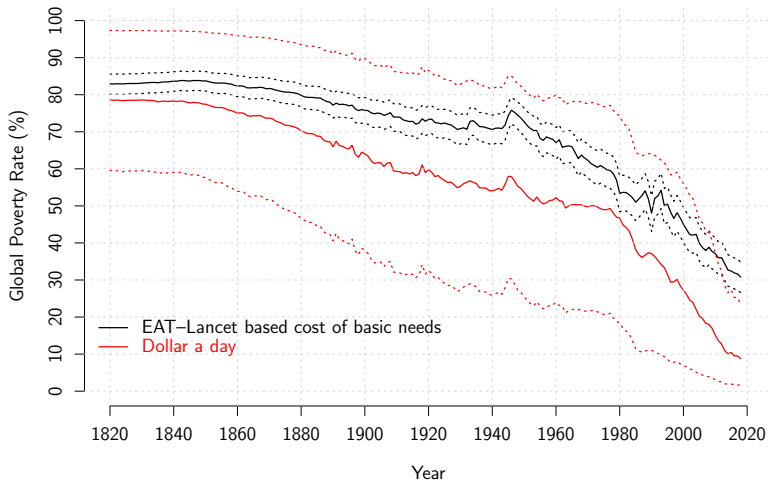


EAT–Lancet: Long run global poverty pop. count

Global Poverty Counts



Uncertainty: EAT–Lancet CBN and \$1.9/day



Conclusions

- On a global level there was less poverty in the 19th century but, ...
- more poverty in recent years than is estimated using all prices in the economy as in the World Bank's dollar-a-day global poverty lines
- The number of individuals living in conditions of poverty according to the the EAT–Lancet based poverty lines has increased by more than threefold since 1820, to reach almost 2.7 billion in 2018.
- The limit of a conservative global poverty count for 2018 stands at almost 35%

Further Steps

- 1 Firmly connect the dots with the 19th century, in terms of food prices and representative CPI.
- 2 Estimate the value of the EAT–Lancet reference diet directly from price data (including the uncertainties in its definitions)
- 3 Directly estimate the uncertainty in the global poverty statistics
- 4 Investigate the divergence between the average CPI rate and the food items based price index in China for the decade around 1990.

Questions? Remarks? Objections?

The healthy ref. diet by EAT–Lancet Commission

	Macronutrient intake (possible range), g/day	Caloric intake, kcal/day
Whole grains		
Rice, wheat, corn, and other	232 (total gains 0–60% of energy)	811
Tubers or starchy vegetables		
Potatoes and cassava	50 (0–100)	39
Vegetables		
All vegetables	300 (200–600)	
Dark green vegetables	100	23
Red and orange vegetables	100	30
Other vegetables	100	25
Fruits		
All fruit	200 (100–300)	126

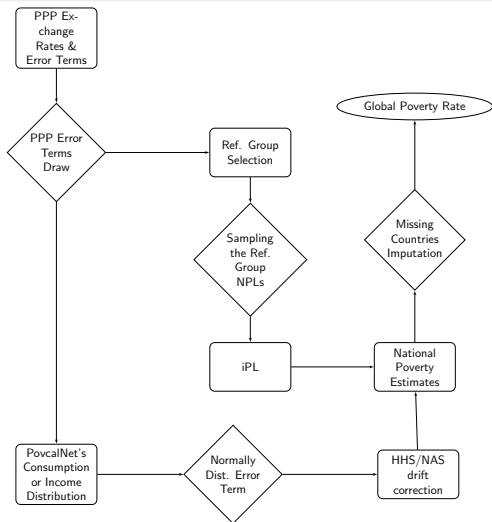
The healthy ref. diet by EAT–Lancet Commission

	Macronutrient intake (possible range), g/day	Caloric intake, kcal/day
Dairy foods		
Whole milk or derivative equivalents (eg, cheese)	250 (0–500)	153
Protein sources		
Beef and lamb	7 (0–14)	15
Pork	7 (0–14)	15
Chicken and other poultry	29 (0–58)	62
Eggs	13 (0–25)	19
Fish	28 (0–100)	40
Legumes		
Dry beans, lentils, and peas	50 (0–100)	172
Soy foods	25 (0–50)	112
Peanuts	25 (0–75)	142
Tree nuts	25	149

The healthy ref. diet by EAT–Lancet Commission

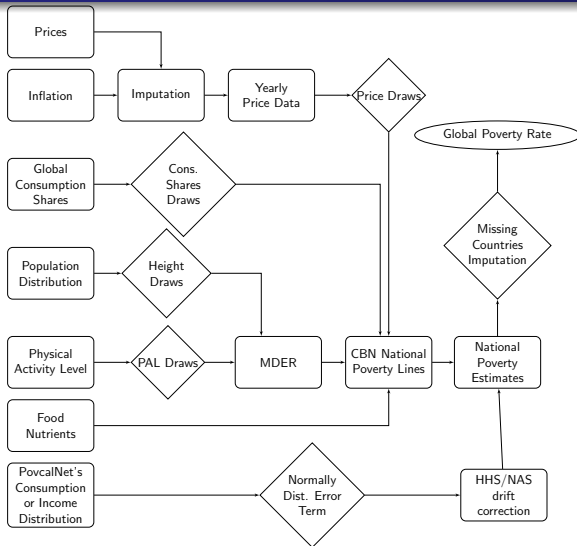
	Macronutrient intake (possible range), g/day	Caloric intake, kcal/day
Added fats		
Palm oil	6.8 (0–6.8)	60
Unsaturated oils	40 (20–80)	354
Dairy fats (included in milk)	0	0
Lard or tallow	5 (0–5)	36
Added sugars		
All sweeteners	31 (0–31)	120

DAD: Monte Carlo Architecture



Moatsos, M., & Lazopoulos, A. (2021). Global poverty : A first estimation of its uncertainty. World Dev. Perspect.

CBN: Monte Carlo Architecture



Moatsos, M., & Lazopoulos, A. (2021). Global poverty : A first estimation of its uncertainty. *World Dev. Perspect.*

Uncertainty Modeling

