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Global Extreme Poverty

by Esteban Ortiz-Ospina and Max Roser [cite]

I. Introduction

I.1 Overview of this entry

This entry is concerned with extreme poverty. The World Bank is the main source for global information on extreme poverty today and sets the International Poverty Line. This poverty line was revised in 2015 – since then a person is considered to be in extreme poverty if he or she is living on less than 1.90 international dollars (int.-$) per day. The poverty measurement is based on the monetary value of a person's *consumption*, but since consumption measures are unfortunately not available for all countries, the World Bank has to rely on income measures for some countries.

A key difficulty for measuring global poverty is that price levels are very different in different countries. For that reason it is not sufficient to convert the consumption levels of people in different countries simply by the market exchange rate; it is additionally necessary to adjust for cross-country differences in purchasing power. This is done through Purchasing Power Parity adjustments (explained below).

It is important to notice that the International Poverty Line is extremely low. Indeed, 'extreme poverty' is the adequate name for those living under this low threshold. Focusing on extreme poverty is important precisely because it captures those most in need. However, it is also important to point out that living conditions well above the International Poverty Line can still be characterized by poverty and hardship. Accordingly, in this entry we will also discuss the global distribution of people below poverty lines that are higher than 1.90 int.-$.

Poverty is a concept intrinsically linked to welfare – and there are many ways in which one can try to measure welfare. In this entry we will focus mainly (though not exclusively) on poverty as measured by 'monetized' consumption and income, following the approach used by the World Bank. Before presenting the evidence, below in this introduction we provide a brief overview of the relevance of this approach.

The available long-run evidence shows that in the past only a small elite enjoyed living conditions that we would not describe as a life in extreme poverty today. But with the onset of industrialization and rising productivity, the share of people living in extreme poverty started to decrease. The share of people in extreme poverty has decreased continuously over the course of the last 2 centuries.

Closely linked to this improvement in material living conditions is the improvement of global health and the expansion of global education that we have seen over these last 2 centuries. We also discuss the link between education, health, and poverty in this entry.

During the first half of the last century, the growth of the world population caused the absolute number of poor people in the world to increase, even though the share of people in poverty was going down. After around 1970, the decrease in poverty rates became so steep that the absolute number of people living in extreme poverty started falling as well. This trend of decreasing poverty – both in absolute numbers and as a share of the world population – has been a constant during the last three decades.

I.2 Extreme poverty in the broader context of well-being

Is poverty only about consumption?

There are many ways in which researchers and policy makers try to measure welfare. In this entry we focus mainly on welfare as measured by 'monetized' consumption and income, following the approach used by the World Bank. But, as we emphasize throughout, this is only one of many aspects that we need to consider when discussing poverty. In other entries we discuss evidence that allows tracking progress in other aspects of welfare that are not captured by standard economic indicators.

The practice of measuring welfare via consumption and income has a long tradition in economics. Many classic textbooks and papers provide details regarding the conceptual framework behind this (for a basic technical overview see Deaton and Zaidi 2002);[1] and by now there is also an extensive literature discussing various important points of contention (see Ch 2. in Atkinson 2016 for a brief recent overview).[2]

Alternative starting points for measuring welfare include subjective views (e.g. self-reported life satisfaction), basic needs (e.g. caloric requirements), capabilities (e.g. access to education), and minimum rights (e.g. right to unpolluted air).

These alternative notions of welfare play an important role in academia and policy, and it is important to bear in mind that they are interrelated. Indeed, as we explain below, many of these concepts enter indirectly the methodology used by the World Bank to measure poverty; for example, by helping set the poverty lines against which monetized consumption is assessed.

This table, from Atkinson (2016) provides a comparison of the 'money-metric approach' used by the World Bank vis-a-vis the most common alternatives.

What do poor people think about poverty?

The most important conclusion from the evidence presented in this entry is that extreme poverty, as measured by consumption, has been going down around the world in the last two centuries. But why should we care? Is it not the case that poor people might only have less consumption but enjoy their lives just as much – or even more – than people with much higher consumption levels?

One way to find out is to simply ask: subjective views are an important way of measuring welfare.

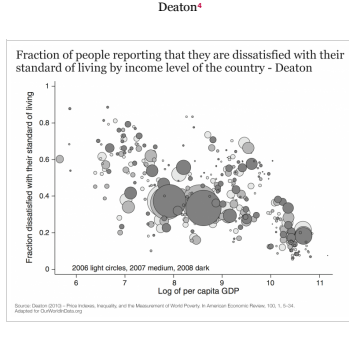
This is what the *Gallup Organization* did. In the World Poll, Gallup asked people around the world what they thought about their standard of living – not only about their income. The economist Angus Deaton[3] compared the answers that people in different countries gave with the average income in these countries. This research is summarized in the following graph; it shows that people living in poorer countries tend to be less satisfied with their living standards in a broader sense.

This suggests that economic prosperity is not a vain, unimportant goal but a means for a better life. The correlation between rising incomes and higher self-reported life satisfaction is shown in the entry on happiness.

This is more than a technical point about how to measure welfare. It is a remark that matters for how we understand and interpret development. There is [redacted] on what 'life in poverty' is like. But there is just no empirical evidence that would suggest that living with very low consumption levels is romantic.

Disregarding poverty estimates that reflect low consumption and income levels is partly explained by the fact that it is very difficult for many people to imagine what it is like to live with very little material means. Even economists who think a lot about income and poverty find it difficult to understand what it means to live on a given income level. It is just hard to get an image of what life is like when all you know is a "dollar-per-day" figure. To address this Anna Rosling Rönnlund put together a very nice project at Gapminder.org in which she portrays the living conditions of people living at different income levels. At [redacted] you find portraits of families and you can see how they cook, what they eat, how they sleep, what toilets they have available, what their children's toys look like and much more.

Fractions of people reporting that they are dissatisfied with their standard of living – Deaton[4]



II. Extreme poverty in a historical perspective

II.1 Historical poverty around the world

The share of people in poverty over the past two centuries

The World Bank publishes data on absolute poverty from 1981 onwards, but researchers have tried to reconstruct information about the living standards of the more distant past. The seminal paper was written by Bourguignon and Morrison in 2002.[5] In this paper, the two authors reconstructed measures of poverty as far back as 1820. The poverty line of 1.90 int.-$ per day was introduced only in 2015, so the 2002 paper used the measure of 'one dollar per day'. This difference in the definition of poverty should be kept in mind when comparing the following graph to those discussed in other sections of this entry.

In 1820, the vast majority of people lived in extreme poverty and only a tiny elite enjoyed higher standards of living. Economic growth over the last 200 years completely transformed our world, and poverty fell continuously over the last two centuries. This is even more remarkable when we consider that the population increased 7-fold over the same time. In a world without economic growth, an increase in the population would result in less and less income for everyone. A 7-fold increase in the world population would be potentially enough to drive everyone into extreme poverty. Yet, the exact opposite happened. In a time of unprecedented population growth we managed to lift more and more people out of poverty.

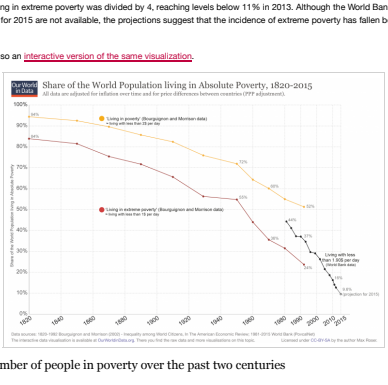
It is very difficult to compare income or consumption levels over long periods because goods and services that are available change so much, and even completely new goods and services become available. This is so important that it would not be wrong to say that every person in the world was extremely poor in the 19th century. [redacted] was surely the richest man in the world when he died in 1836. But the cause of his death was an infection; this is a condition that [redacted], available for purchase today for less than a couple of cents.

This means that the level of poverty, especially for the distant past, is hard to judge. What is however clear is the trend over time. As more and more countries industrialised and increased the productivity of work, the economies started to grow and poverty started to decline. According to Bourguignon and Morrison a little more than a quarter of the world population was not living in poverty by 1950.

From 1981 onward we have better empirical data on global extreme poverty. The Bourguignon and Morrison estimates for the past are based on national accounts and additional information on the level of inequality within countries. The data from 1981 onwards comes from the World Bank, which bases their estimates on household surveys. (Below, more on where historical poverty estimates come from).

According to these household surveys, 44% of the world population lived in absolute poverty in 1981. Since then, the share of poor people has declined very fast – in fact faster than ever before in world history. In 32 years the share of people living in extreme poverty was divided by 4, reaching levels below 11% in 2013. Although the World Bank estimates for 2015 are not available, the projections suggest that the incidence of extreme poverty has fallen below 10%.

There is also an interactive version of the same visualization.



The number of people in poverty over the past two centuries

We have seen that the chance of being born into poverty has declined dramatically over the last 200 years. But what about the absolute number of people living in extreme poverty?

The visualization below combines the information on the share of extreme poverty shown in the last chart, with the number of people living in the world. Prior to 1970 we use here the estimates of people 'living in poverty' from Bourguignon and Morrison (2002); from 1981 we use the World Bank estimates.

As we can see, in 1820 there were just under 1.1 billion people in the world, of which more than 1 billion lived in extreme poverty. Over the next 150 years the decline of poverty was not fast enough to offset the very rapid rise of the world population, so the number of non-poor and poor people increased. Since around 1970 we are living in a world in which the number of non-poor people is rising, while the number of poor people is falling. According to the estimates shown below there were 2.2 billion people living in extreme poverty in 1970, and there were 705 million people living in extreme poverty in 2015. The number of extreme poor people in the world is 3 times lower than in 1970.

In 1990 there were 2 billion people living in extreme poverty. With a reduction to 705 million in 2015 this means that – on average – on every day in these 25 days 137,000 fewer people were living in extreme poverty.[6]

On every day in the last 25 years there could have been a newspaper headline saying "The number of people in extreme poverty fell by 137,000 since yesterday". Unfortunately the slow developments that transform our world entirely never make the news, and this is very reason why we are working on this online publication.

II.2 Historical poverty in today's rich countries

We have already pointed out that in the thousands of years before the beginning of the industrial era, the vast majority of the world population lived in conditions that we would call extreme poverty today. Productivity levels were low and food was scarce – material living standards were generally very low.

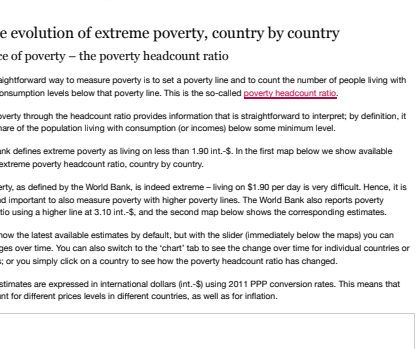
The first countries in which people improved their living conditions were those that industrialised first. The chart below shows the decline of extreme poverty in these countries.

These estimates come from Ravallion (2015).[7] They use a poverty line of 1.25 int.-$ in 2005 prices, and they rely on incomes measured from national accounts. The 'national accounts' method to estimate poverty is based on academic studies that reconstruct historical income levels from cross-country macro estimates on economic output and inequality. (Below, more on the 'national accounts' method to estimate poverty.)

Two points are worth emphasizing.

First, we can see that extreme poverty was very common in today's rich countries until fairly recently; in fact, in most of these countries the majority of the population lived in extreme deprivation only a couple of centuries ago. Progress was made at a fast pace – in some cases even at a constant pace. We definitely can end extreme poverty in low income countries, and we can do it soon. Other countries have done it before.

Second, we can also see from this chart that despite remarkable progress, in some rich countries – notably the United States – there is still a sizeable fraction of the population living in extreme poverty. This is the result of exceptionally high income inequality. (Below, more on extreme poverty in rich countries).



III. Extreme poverty around the world today

III.1 The evolution of extreme poverty, country by country

Prevalence of poverty – the poverty headcount ratio

The most straightforward way to measure poverty is to set a poverty line and to count the number of people living with incomes or consumption levels below that poverty line. This is the so-called poverty headcount ratio.

Measuring poverty through the headcount ratio provides information that is straightforward to interpret; by definition, it tells us the share of the population living with consumption (or incomes) below some minimum level.

The World Bank defines extreme poverty as living on less than 1.90 int.-$. In the first map below we show available estimates of extreme poverty headcount ratio, country by country.

Extreme poverty, as defined by the World Bank, is indeed extreme – living on $1.90 per day is very difficult. Hence, it is interesting and important to also measure poverty with higher poverty lines. The World Bank also reports poverty headcount ratio using a higher line at 3.10 int.-$, and the second map below shows the corresponding estimates.

Both maps show the latest available estimates by default, but with the slider (immediately below the maps) you can explore changes over time. You can also switch to the 'chart' tab to see the change over time for individual countries or world regions; or you simply click on a country to see how the poverty headcount ratio has changed.

In all cases estimates are expressed in international dollars (int.-$) using 2011 PPP conversion rates. This means that figures account for different prices levels in different countries, as well as for inflation.

Average intensity of poverty – the poverty gap index

Measuring poverty through headcount ratios fails to capture the intensity of poverty – individuals with consumption levels marginally below the poverty line are counted as being poor just as individuals with consumption levels much further below the poverty line.

The most common way to deal with this is to measure the intensity of poverty, by calculating the amount of money required by a poor household in order to reach the poverty line. In other words, the most common approach is to calculate the income or consumption shortfall from the poverty line.

To produce aggregate statistics, the sum of all such shortfalls across the entire population in a country (counting the non-poor as having zero shortfall) is often expressed in per capita terms. This is the mean shortfall from the poverty line.

The 'poverty gap index' – a common statistic [redacted] – takes the mean shortfall from the poverty line, and divides it by the value of the poverty line. It tells us the fraction of the poverty line that people are missing, on average, in order to escape poverty.

The following map plots available estimates for the poverty gap index, country by country. As we can see, there is a clear positive correlation between the incidence of poverty and the intensity of poverty: sub-Saharan Africa, where the share of people below the poverty line is higher, is also the region where people tend to be furthest below the poverty line.

Interestingly, the correlation is very strong, but is far from perfect. For example, India and Bolivia have relatively similar poverty gaps (mean shortfall is close to 4% of the poverty line), but they have very different poverty rates (the share of population in poverty in India is 21%, while in Bolivia it is 7.7%). This can be appreciated in a scatter plot of poverty headcount rates vs. poverty gap indices.

Total intensity of poverty in monetary terms – the absolute poverty gap

As discussed above, the poverty gap index is often used in policy discussions because it has an intuitive unit (per cent mean shortfall) that allows for meaningful comparisons regarding the relative intensity of poverty. But given that the poverty line is very low, and some countries have more poor people than others, it's often easy to lose perspective on the actual absolute magnitude of the numbers we are dealing with.

The following two visualization show the absolute yearly monetary value of the poverty gap, for the world (top chart) and country by country (bottom chart). The numbers come from multiplying the poverty gap index, by both the poverty line and total population.

As can be seen, the monetary value of the global poverty gap today is about half of what it was a decade ago. This shows that in recent years we have substantially reduced both the incidence and the intensity of poverty.

You can read about these estimates in the context of the 'cost of ending extreme poverty' in our related blog post, here.

The Chinese effect on global poverty trends

All of the evidence above suggests that the population living in extreme poverty has fallen very substantially in the last 200 years, across the world. As we have noted, on aggregate, the global population in extreme poverty went from 80% in 1820 to 10% in the latest estimates.

This remarkable achievement was largely, though not exclusively due to the important historical improvements of living conditions in China. The following chart shows this, by plotting poverty rates in the world, with and without China. We see that the reduction of global poverty has been substantial even when we do not take into account the poverty reduction in China. In 1981 almost one third (29%) of the non-Chinese world population was living in extreme poverty. By 2013 this share had fallen to 12%.

You can read more about this chart in our related blog post, here.

The (mis)perceptions about poverty trends

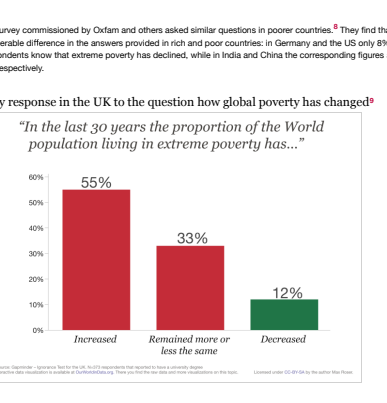
Despite the evidence, many people are not aware of the fact that extreme poverty is declining across the world.

The chart below shows the perceptions that survey-respondents in the UK have regarding global achievements in poverty reductions. While the share of extremely poor people has fallen faster than ever before in history over the last 30 years, the majority of people in the UK thinks that the opposite has happened, and that poverty has increased!

The chart below presents evidence from a survey in the UK, but ignorance of global development is even greater in other countries that were also surveyed. The extent of ignorance in the UK is particularly bad if we take into account that the shown result correspond to population with a university degree. See [redacted] for more evidence.

A more recent survey commissioned by Oxfam and others asked similar questions in poorer countries.[8] They find that there are considerable difference in the answers provided in rich and poor countries: in Germany and the US only 8% of the survey respondents know that extreme poverty has declined, while in India and China the corresponding figures are 27% and 50% respectively.

Survey response in the UK to the question how global poverty has changed[9]



III.2 The evolution of poverty by world regions

Total population in extreme poverty, by world regions

Above we provide an overview of recent poverty trends country by country. Here we focus on trends from a regional perspective.

The first chart below provides regional estimates of poverty counts (i.e. the total number of people living below the International Poverty Line in each region), while the second chart provides regional estimates of poverty rates (i.e. the share of population in each region living below the International Poverty Line).

Figures correspond to the International Poverty Line, at 1.90 int.$ in 2011 PPP prices.

As we can see, globally, the number of people living in extreme poverty fell by more than 1 billion during the reference period; from 1.85 billion in 1990 to 0.76 billion in 2013. On average the number of people living in extreme poverty declined by 47 million every year since 1990 (or 130,000 every single day).

This very positive development has been possible, in part, by the remarkable improvements in East Asia and the Pacific, where poverty rates went from 60% in 1990 to 3.5% in 2013. However, this is not just an 'Asian pattern' – as the charts below show, extreme poverty has been falling in all world regions.

Total population in non-rich countries, by per capita household consumption

In the visualization below we show a breakdown of the population in non-rich countries by per capita household consumption. This chart provides an interesting overview of how consumption in low and middle income countries has grown at the bottom of the distribution over the last couple of decades.

As we can see, the group at the very bottom is getting smaller, and the population has been generally shifting from the bottom brackets into the middle brackets: there is a decreasing number of people in extreme poverty (those below 1.90 int.-$) or close to extreme poverty (those between 1.90-3.10 int.-$); while there is an increasingly large number of people moving up into what we could call the 'growing middle class'.

You can click on the option 'relative' to see the figures in terms of shares. The result for the top bracket deserves particular attention: the share of the population in non-rich countries living with more than the equivalent of $10 per day went up from 9% in 1981, to 23% in 2013.

III.3 The demographics of extreme poverty

How many poor people live in each country?

The global incidence of extreme poverty has gone down from almost 100% in the 19th century, to 10.7% in 2013. While this is a great achievement, there is absolutely no reason to be complacent: a poverty rate of 10.7% means a total poverty headcount of 746 million people. Where do they live? The following visualization provides a breakdown of this figure by continent and country.

These figures come from multiplying estimates of poverty rates by country, by the corresponding estimates of total population in those countries. The poverty rate estimates come from the World Bank (2016 [redacted] release, using 2013 household survey data);[10] and total population estimates come from the [redacted].

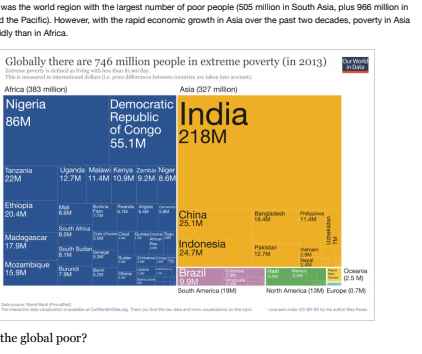
As usual with World Bank estimates, poverty measures are adjusted to account for differences in price levels between countries. This is reflected in the 'international dollar' metric used to measure incomes.

As we can see, Africa is today the continent with the largest number of people living in extreme poverty. The breakdown by continent is as follows:

- 383 Million in Africa
- 327 Million in Asia
- 19 Million in South America
- 13 Million in North America
- 2.5 Million in Oceania
- 0.7 Million in Europe

We can also see that India is the country with the largest number of people living in extreme poverty (218 million people). Nigeria and the Congo (DRC) follow with 86 and 55 million people.

These figures are the result of important changes across time. As we mention above in our discussion of regional trends, in 1990 Asia was the world region with the largest number of poor people (505 million in South Asia, plus 966 million in East Asia and the Pacific). However, with the rapid economic growth in Asia over the past two decades, poverty in Asia fell more rapidly than in Africa.



Who are the global poor?

The World Bank Group recently published a new set of poverty estimates, as part of their report [redacted]. These estimates, explained in detail in two related background papers (Newhouse et al. 2016 and Castaneda et al. 2016)[11][12] are consistent with the official World Bank poverty figures published in [redacted] and the [redacted], but they are disaggregated by key demographic characteristics such as age and educational attainment.

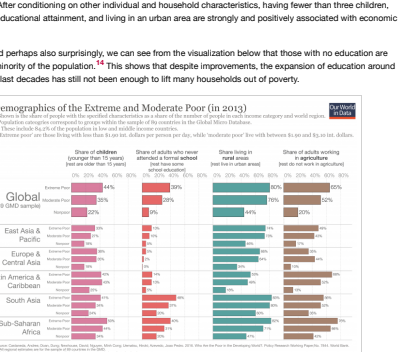
In order to produce disaggregated estimates, the World Bank relied on new data from the Global Micro Database – an instrument that augments survey data in 89 countries, by providing a set of harmonized household characteristics, enriching the other survey instruments used by the World Bank to measure poverty.

According to the World Bank, the sample of 89 countries included in the Global Micro Database contains an estimated 84.2 percent of the population in low and middle income countries, and 82.1 percent of the child population.[13] In this map you can see exactly which territories are covered. As the authors point out, while not every country is covered, this new set of estimates is the most updated and comprehensive source currently available to researchers and policymakers trying to understand the demographics of poverty.

The following visualization uses this source to provide a characterization of those who live in poverty. As we can see, across all world regions the poor tend to be young and live in rural areas.

In the background paper accompanying the data, Castaneda et al. (2016) provide simple regression results and conclude that "After conditioning on other individual and household characteristics, having fewer than three children, having greater educational attainment, and living in urban area are strongly and positively associated with economic well-being".

Interestingly, and perhaps also surprisingly, we can see from the visualization below that those with no education are now a distinct minority of the population.[14] This shows that despite improvements, the expansion of education around the world in the last decades has still not been enough to lift many households out of poverty.



How many children live in extreme poverty around the world?

Global estimates of child poverty are unfortunately not available. However, as we mention above, we can have a reasonable picture of this issue by looking at the estimates recently published by World Bank using the Global Micro Database.

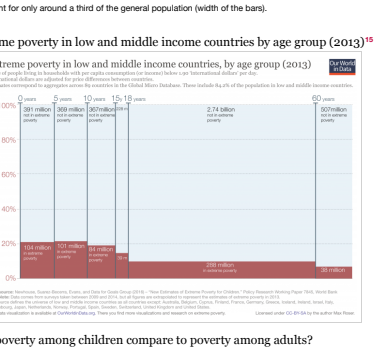
For measurement purposes, children are considered to be poor if they live in a poor household (i.e. all children in poor households are assumed to be poor, while all children in non-poor households are assumed to be non-poor). A household is considered poor, in turn, if the per capita consumption of its members (or per capita income, depending on the country), falls below 1.90 int.$. This is the standard definition of absolute extreme poverty used by the World Bank.

The following chart summarizes the available data. The height of each bar in this plot shows the incidence of poverty by age group (i.e. the poverty headcount rate for each age bracket), while the width of the bars reflects the total size of each age group in the overall population. The area of each bar (height times width) gives the number of individuals living in extreme poverty within each age bracket – these are the numbers written inside each bar.

As we can see, poverty is particularly high among children: in low and middle income countries more than 20% of children under 10 years of age live with less than 1.90 int.-$ per day. For adults, the corresponding figures are much lower: less than 10% of adults live with comparably low consumption levels.

By looking at the total number of people in extreme poverty (area of the bars) we can also see another important fact: virtually half of the people living in extreme poverty are under 18 years of age. This is large if we consider that those under 18 account for only around a third of the general population (width of the bars).

Extreme poverty in low and middle income countries by age group (2013)[15]



How does poverty among children compare to poverty among adults?

The above-mentioned data from the Global Micro Database allows us to study poverty across age groups for various poverty lines – not just the International Poverty Line.

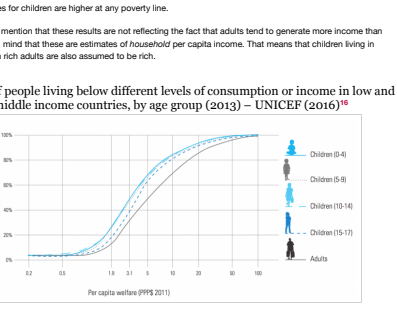
The following chart shows the cumulative distribution of welfare for different age groups. Each of the lines in this plot shows, for a different age group, the share of the population living below a given level of per capita income or consumption (after accounting for differences in prices across countries).

If you locate the vertical line passing through $1.9 in the horizontal axis, you will see that it cuts the series for adults at around 9%. This means that around 9% of the adult population lives with consumption (or income) levels below the 1.90 int.-$ poverty line. Following this logic, we can read the poverty rates at any poverty line.

As we can see, the distribution of consumption for adults is always to the right of the distribution for children. In economics lingo, what we observe is that the distribution for adults stochastically dominates that of children. This means that poverty rates for children are higher at any poverty line.

It's important to mention that these results are not reflecting the fact that adults tend to generate more income than children. Bear in mind that these are estimates of household per capita income. That means that children living in households with rich adults are also assumed to be rich.

Percent of people living below different levels of consumption or income in low and middle income countries, by age group (2013) – UNICEF (2016)[16]



III.4 The future of extreme poverty

How realistic is the goal of ending global extreme poverty by 2030?

The [redacted] of the World Bank is to end extreme poverty by 2030. How realistic is this goal?

Answering this question obviously requires making assumptions. The following visualization shows the historical decline in global extreme poverty rates, from 1981 to 2013, and adds a projection for 2030 assuming (i) that the average growth rates of consumption in all countries will be the same as the average growth rates from the past 10 years; and (ii) that the dispersion in the distribution of consumption in each country will remain unchanged.

Let's call this a 'realistic baseline scenario'. It suggests that extreme poverty will likely continue going down significantly, but will not drop to zero by 2030.

As we show in the next chart, ending extreme poverty by 2030 is likely to require not only sustained economic growth, but also lowering inequality.

Ending extreme poverty by 2030 is likely to require 'inclusive growth'

In the visualization above we present a tentative projection of poverty rates assuming that growth rates will remain constant at historical 10-year average values, while inequality remains unchanged. This is only one of many plausible scenarios. What would happen if, for example, we manage to generate 'inclusive growth', such that average income levels go up while inequality goes down?

The following visualization from Chandy et al. (2013)[17] tries to answer this question.

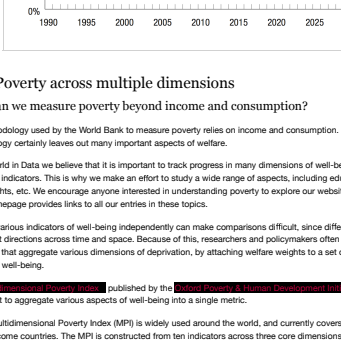
The solid orange line corresponds to the baseline scenario (see the explanation above), while the gray area within the dashed lines shows the range of possible forecasts that could be obtained by keeping the underlying assumption regarding consumption growth rates, and considering various alternative assumptions regarding future changes in inequality.

To be specific, the gray area in this chart shows the range of poverty estimates that would take place if we assume that the shares of total consumption held by the poorest 40 percent and the richest 10 percent in each country steadily shift in favor of one or other group between 2010 and 2030. For the purpose of simulating various scenarios, the authors move these 40-10 shares upward or downward in increments of a quarter of a percentage point per year – which they argue reflects the scale of long term distribution trends observed in historical data.

The figures in the chart below are somewhat dated, and they are not exactly comparable to those in the chart above (the figures below correspond to a poverty line of 1.25 int.-$ at 2005 PPP prices, rather than the updated 1.90 int-$ line at 2011 PPP prices). But still, they give us an idea of how much the baseline projections would change if we considered alternative assumptions regarding inequality.

As we can see, the range is wide; and yet even in the most optimistic scenario, in which there is sustained growth and inequality goes down considerably, projected poverty rates remain above zero. The conclusion seems to be that if we do end poverty by 2030, it will likely be through inclusive growth.

Projections of extreme poverty rates based on alternative scenarios for inequality (with a poverty line of 1.25 int-$ at 2005 PPP prices) – Chandy et al. (2013)[18]



III.5 Poverty across multiple dimensions

How can we measure poverty beyond income and consumption?

The methodology used by the World Bank to measure poverty relies on income and consumption. While informative, this methodology certainly leaves out many important aspects of welfare.

In Our World in Data we believe that it is important to track progress in many dimensions of well-being beyond standard economic indicators. This is why we make an effort to study a wide range of aspects, including education, health, human rights, etc. We encourage anyone interested in understanding poverty to explore our website – the content menu in our homepage provides links to all our entries in these topics.

Tracking various indicators of well-being independently can make comparisons difficult, since different indicators move in different directions across time and space. Because of this, researchers and policymakers often construct synthetic indicators that aggregate various dimensions of deprivation, by attaching welfare weights to a set of key underlying metrics of well-being.

The [redacted] published by the [redacted], is one such effort to aggregate various aspects of well-being into a single metric.

OPHI's Multidimensional Poverty Index (MPI) is widely used around the world, and currently covers over 100 low and middle income countries. The MPI is constructed from ten indicators across three core dimensions: health, education and living standards. This table specifies how the different indicators are defined and aggregated.

The MPI is constructed using three main datasets: the [redacted], the [redacted], and the [redacted].

You can find further definitions and explanations in the [redacted]. And you can find a more technical discussion of the MPI and its properties in Alkire and Foster (2011).[19]

The MPI is typically used to assess deprivation at the individual level: if someone is deprived in a third or more of the ten (weighted) indicators, the index identifies them as 'MPI poor'. In the following map we show, country by country, the share of MPI poor people (i.e. the multidimensional poverty headcount ratios). As we can see, this alternative metric shows that poverty is also particularly acute in sub-Saharan Africa.

How well do income and consumption capture multidimensional poverty?

As we mention above, poverty is multidimensional in nature, and it is therefore convenient to try to measure poverty through alternative instruments that capture deprivation beyond income and consumption. The [redacted] published by the [redacted] is the most common international instrument used in this context.

The following chart plots the share of people living in extreme poverty as measured by consumption and income, against the share of people living in 'multidimensional poverty' according to the MPI. The former is the same metric we have discussed extensively throughout this entry. The latter is a metric based on unmet needs: the MPI's definition stipulates that someone lives in 'multidimensional poverty' if they are deprived in a third or more of the ten (weighted) indicators that compose the index.

As we can see, there is a positive correlation between these two measures of deprivation, but they are clearly not identical. Swaziland and South Sudan have similar monetary poverty rates (about 42% of the population live below the International Poverty Line), but they have extremely different multidimensional poverty rates (around 20% in Swaziland, compared to 91% in South Sudan are living in 'multidimensional poverty'). This highlights the usefulness of tracking deprivation across multiple dimensions of well-being, including both standard and non-standard economic indicators. This is our approach at Our World in Data.

IV. Correlates, determinants and consequences

IV.1 Poverty traps

What are 'poverty traps'?

Economists use the term 'poverty trap' to denote a situation in which individuals are stuck in deprivation over long periods of time, and there is nothing they can do by themselves to escape such situation. The idea is simple: poverty today causes poverty in the future, so households that start poor, remain poor.

Insufficient nutrition, for example, can lead to a poverty trap. More precisely, if physical capacity to work increases nonlinearly with food intake at low levels (i.e. if the first calories that we consume are used by our body to survive, rather than to provide the strength required to work), it is possible that those in extreme poverty get stuck in a perverse equilibrium characterized by low incomes and low nutrition: poor nutrition becomes both the cause and consequence of poor incomes.

Conceptually, poverty traps can also take place at a collective 'macro' level. For example, low-income countries may lack good growth fundamentals (e.g. technology, human and physical capital, etc.) in order to support high saving rates leading to productivity gains that would be necessary to raise national incomes.

The concept of poverty traps is important in the context of policy, since it implies that one-off policy efforts that 'break the trap' have permanent positive effects. This is the rationale often used to argue for 'big push' macro policies – such as the expansion of micro-finance in low-income countries – that are meant to trigger a virtuous circle of more savings, more investment and economic growth.

As we discuss below, although unidimensional poverty traps such as those caused by single factors are conceptually appealing (e.g. nutrition-based traps, or country-level savings traps), there is little empirical evidence supporting their practical relevance. The evidence suggests that multi-pronged interventions, aimed at relieving multiple joint constraints at the household-level, are more likely to reduce poverty than 'big push' macro policies, such as the expansion of micro-finance.

How common are poverty traps?

As mentioned above, a 'poverty trap' is a situation where incomes are stagnant over long periods, because 'poverty today causes poverty in the future'.

The following chart provides some evidence regarding the cross-country evolution of incomes over time. It plots, for each country, the national income in 1960 against the corresponding national income in 2010. GDP per capita is used to measure national incomes, and figures are expressed in 'real terms', which means they are adjusted for inflation.

In this chart, if incomes are stagnant, we should observe countries lining closely along a line with unit slope (i.e the line tracing equal GDP per capita in 1960 and 2010). Countries with growing incomes, on the other hand, should be scattered above such line.

As we can see, some countries such as Haiti and Burundi do seem to have stagnant average incomes – they are right on the unit-slope line. And a couple of countries such as the Democratic Republic of Congo have even experienced negative growth over the reference period. Yet these are exceptions. Most countries have experienced growth.

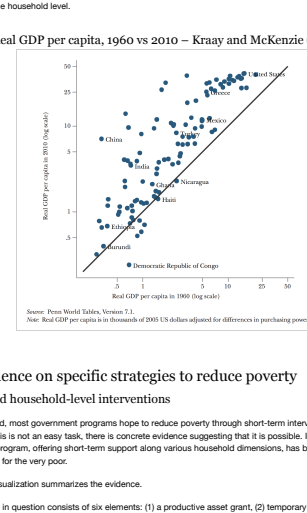
A closer look at the data suggests that the typical poor country grew at least as fast as the global average over this period.[20]

Of course, what we see in this chart is only part of the story, since micro and macro dynamics of incomes can be very different. It is possible, for example, that country-level average incomes are not stagnant, but household-level incomes lag for particular segments of the population within those countries – indeed, [redacted]. Thus, a proper test of the existence of poverty traps requires a more sophisticated econometric analysis.

Kraay and McKenzie (2014)[21] provide an interesting and detailed review of the available studies testing for the existence of mechanisms leading to poverty traps. They argue that there is limited evidence for most of the mechanisms when operating in isolation; except perhaps for spatial poverty traps (individuals being trapped in low-productivity locations), and behavioral poverty traps (individuals being stuck in situations where they devote most mental effort to meeting daily needs, leaving little attentional resources for solving other problems that could raise their incomes).

The implication of this evidence should not be that there is no role for policy; but rather that traditional 'big push' macro policies are perhaps not the best approach to reduce poverty. Other, less traditional policies might work better. Below we discuss some examples, such as encouraging migration, and implementing multifaceted programs that relieve joint constraints at the household level.

Real GDP per capita, 1960 vs 2010 – Kraay and McKenzie (2014)[22]



Source: Penn World Tables, Version 7.1.
Note: Real GDP per capita is in thousands of 2005 US dollars adjusted for differences in purchasing power.

IV.2 Evidence on specific strategies to reduce poverty

Multifaceted household-level interventions

Around the world, most government programs hope to reduce poverty through short-term interventions that have lasting effects. While this is not an easy task, there is concrete evidence suggesting that it is possible. In six different countries, a multifaceted program, offering short-term support along various household dimensions, has been shown to cause lasting progress for the very poor.

The following visualization summarizes the evidence.

The intervention in question consists of six elements: (1) a productive asset grant, (2) temporary cash consumption support, (3) technical skills training, (4) high frequency home visits, (5) a savings program, and (6) health education and services.

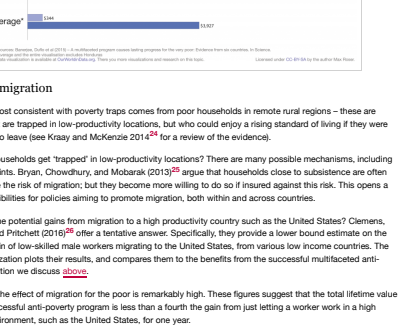
The light blue bars show the impact of this intervention, measured by the yearly average increase in household consumption, three years after the productive asset transfer (and one year after the end of the program intervention). The dark blue bar shows the 'net present value' of the transfer – that is, the value of the benefits assuming these gains last forever, minus the program costs (discounting benefits and costs by how far in the future they occur).

Although the costs of this intervention are substantial, we can see that the net benefits are still positive and large, precisely because impacts are sustained in the future.

The results below come from Randomized Controlled Trials (RCT). This evaluation technique consists in administering the policy intervention to a random group of individuals (the 'treatment group') and evaluating the effect by comparing outcomes against another group of individuals who were not affected by the policy (the 'control group'). This is the idea behind medical trials.

The full study and results are explained in Banerjee et al. (2015).[23] They report impacts on consumption, food security, productive and household assets, financial inclusion, time use, incomes and revenues, physical health, mental health, political involvement, and women's empowerment. They find statistically significant impacts on all of these outcomes.

Given the lack of comparably positive results from other evaluations, this is often considered a 'gold standard'.



Promoting migration

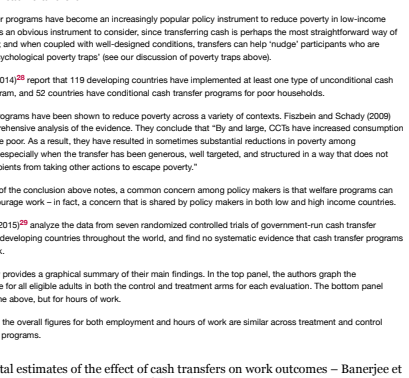
The evidence most consistent with poverty traps comes from poor households in remote rural regions – these are households that are trapped in low-productivity locations, but who could enjoy a rising standard of living if they were somehow able to leave (see Kraay and McKenzie 2014[24] for a review of the evidence).

How do poor households get 'trapped' in low-productivity locations? There are many possible mechanisms, including liquidity constraints. Bryan, Chowdhury, and Mobarak (2013)[25] argue that households close to subsistence are often unwilling to take the risk of migration; but they become more willing to do so if insured against this risk. This opens a window of possibilities for policies aiming to promote migration, both within and across countries.

How large are the potential gains from migration to a high productivity country such as the United States? Clemens, Montenegro, and Pritchett (2016)[26] offer a tentative answer. Specifically, they provide a lower bound estimate on the annual wage gain of low-skilled male workers migrating to the United States, from various low income countries. The following visualization plots their results, and compares them to the benefits from the successful multifaceted anti-poverty intervention we discuss above.

As can be see, the effect of migration for the poor is remarkably high. These figures suggest that the total lifetime value of the most successful anti-poverty program is less than a fourth the gain from just letting a worker work in a high productivity environment, such as the United States, for one year.

Of course, from a social welfare point of view, these effects have to be considered in conjunction with the effects on 'native' workers in the new host environments. Ottaviano and Peri (2011)[27] estimate that over the period 1990–2006, immigration to the United States had at most a modest negative long-run effect on the real wages of the least educated 'natives'. As the authors explain, this is possible because there are complementarities between groups of workers: 'natives' and 'immigrants' of similar education and age have different skills, often work in different jobs and perform different productive tasks.



Conditional cash transfers

Targeted transfer programs have become an increasingly popular policy instrument to reduce poverty in low-income countries. This is an obvious instrument to consider, since transferring cash is perhaps the most straightforward way of raising incomes; and when coupled with well-designed conditions, transfers can help 'nudge' participants who are caught up in 'psychological poverty traps' (see our discussion of poverty traps above).

Gentilini et al. (2014)[28] report that 119 developing countries have implemented at least one type of unconditional cash assistance program, and 52 countries have conditional cash transfer programmes for poor households.

Cash transfer programs have been shown to reduce poverty across a variety of contexts. Fiszbein and Schady (2009) provide a comprehensive analysis of the evidence. They conclude that "By and large, CCTs have increased consumption levels among the poor. As a result, they have resulted in substantial reductions in poverty among beneficiaries — especially when the transfer has been generous, well targeted, and structured in a way that does not discourage recipients from taking other actions to escape poverty."

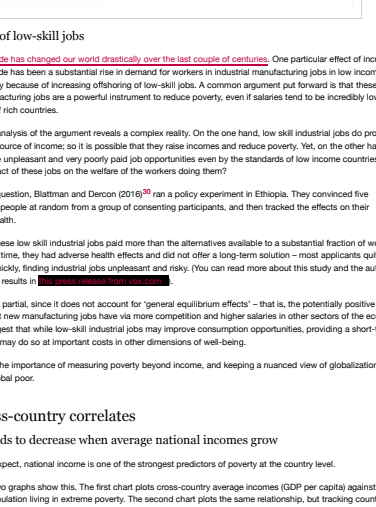
As the last part of the conclusion above notes, a common concern among policy makers is that welfare programs can potentially discourage work – in fact, a concern that is shared by policy makers in both low and high income countries.

Banerjee et al. (2015)[29] analyze the data from seven randomized controlled trials of government-run cash transfer programs in six developing countries throughout the world, and find no systematic evidence that cash transfer programs discourage work.

The chart below provides a graphical summary of their main findings. In the top panel, the authors graph the employment rate for all eligible adults in both the control and treatment arms for each evaluation. The bottom panel replicates the one above, but for hours of work.

As can be seen, the overall figures for both employment and hours of work are similar across treatment and control across all of the programs.

Experimental estimates of the effect of cash transfers on work outcomes – Banerjee et al. (2015)



Offshoring of low-skill jobs

International trade has changed our world drastically over the last couple of centuries. One particular effect of increasing international trade has been a substantial rise in demand for workers in industrial manufacturing jobs in low income countries, mainly because of increasing offshoring of low-skill jobs. A common argument put forward is that these industrial manufacturing jobs are a powerful instrument to reduce poverty, even if salaries tend to be incredibly low by the standards of rich countries.

A more careful analysis of the argument reveals a complex reality. On the one hand, low skill industrial jobs do provide a formal, steady source of income; so it is possible that they raise incomes and reduce poverty. Yet, on the other hand, these tend to be unpleasant and very poorly paid job opportunities even by the standards of low income countries. So what is the impact of these jobs on the welfare of the workers doing them?

To answer this question, Blattman and Dercon (2016)[30] ran a policy experiment in Ethiopia. They convinced five factories to hire people at random from a group of consenting participants, and then tracked the effects on their incomes and health.

They find that these low skill industrial jobs paid more than the alternatives available to a substantial fraction of workers; but at the same time, they had adverse health effects and did not offer a long-term solution – most applicants quit the formal sector quickly, finding industrial jobs unpleasant and risky. (You can read more about this study and the authors' interpretation of results in [redacted].)

This evidence is partial, since it does not account for 'general equilibrium effects' – that is, the potentially positive long-term effects that new manufacturing jobs have via more competition and higher salaries in other sectors of the economy. But it does suggest that while low-skill industrial jobs may improve consumption opportunities, providing a short-term safety net, they may do so at important costs in other dimensions of well-being.

This reinforces the importance of measuring poverty beyond income, and keeping a nuanced view of globalization's effect on the global poor.

IV.3 Cross-country correlates

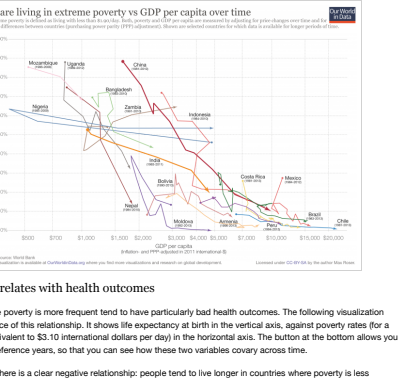
Poverty tends to decrease when average national incomes grow

As one would expect, national income is one of the strongest predictors of poverty at the country level.

The following two graphs show this. The first chart plots cross-country average incomes (GDP per capita) against the share of the population living in extreme poverty. The second chart plots the same relationship, but tracking countries over time (i.e. each country is shown here as succession of points, one for each yearly observation of GDP and poverty).

As we can see, extreme poverty is less common in richer countries; and as countries get richer, poverty tends to decline.

This relationship is partly driven by inequality, since disposable incomes tends to be more equally distributed in rich countries. This is both the result of more redistribution, and more income-generating opportunities for those at the bottom of the income distribution in rich countries.



Poverty correlates with health outcomes

Countries where poverty is more frequent tend to have particularly bad health outcomes. The following visualization provides evidence of this relationship. It shows life expectancy at birth in the vertical axis, against poverty rates (for a poverty line equivalent to $3.10 international dollars per day) in the horizontal axis. The button at the bottom allows you to change the reference years, so that you can see how these two variables covary across time.

As we can see there is a clear negative relationship: people tend to live longer in countries where poverty is less common. Yet the correlation is far from perfect – some countries such as South Africa have a relatively low life expectancy in comparison to other countries with similar poverty rates. This reinforces the importance of thinking about deprivation beyond income and consumption.

Poverty correlates with education outcomes

Above we show that poverty correlates with health. Here we provide evidence of another important correlate: education.

The following visualization plots mean years of schooling against poverty rates (again using a poverty line equivalent to $3.10 international dollars per day). As before, the button at the bottom allows you to change the reference years, so that you can see how these two variables covary across time.

As we can see, there is again a clear negative relationship: poverty tends to be more frequent in countries where education is less developed. As we discuss above, there is also household-level evidence of this correlation – schooling is one of the strongest predictors of economic well-being, even after controlling for other household characteristics.

V. Measurement and Data Quality

V.1 What are the main indicators used to measure poverty?

The 'poverty headcount ratio'

The most straightforward way to measure poverty is to set a poverty line and to count the number of people living with incomes or consumption levels below that poverty line. This is the *poverty headcount ratio*.

Measuring poverty through the headcount ratio provides information that is straightforward to interpret; by definition, it tells us the share of the population living with consumption (or incomes) below some minimum level.

Unfortunately, measuring poverty through headcount ratios fails to capture the intensity of poverty – individuals with consumption levels marginally below the poverty line are counted as being poor just as individuals with consumption levels much further below the poverty line.

The poverty gap index is an alternative way of measuring poverty that considers the intensity of deprivation.

The 'poverty gap index'

The most common way to measure the intensity of poverty is to calculate the amount of money required by a poor household in order to reach the poverty line. In other words, the most common approach is to calculate the income or consumption shortfall from the poverty line.

To produce aggregate statistics, the sum of all such shortfalls across the entire population in a country (counting the non-poor as having zero shortfall) is often expressed in per capita terms. This is the mean shortfall from the poverty line.

The 'poverty gap index' takes the mean shortfall from the poverty line, and divides it by the value of the poverty line. It tells us the fraction of the poverty line that people are missing, on average, in order to escape poverty.

The poverty gap index is often used in policy discussions because it has an intuitive unit (per cent mean shortfall) that allows for meaningful comparisons regarding the relative intensity of poverty.

The difference between 'absolute' and 'relative' poverty

Absolute poverty is measured relative to a fixed standard of living; that is, an income threshold that is constant across time and countries. This notion of poverty allows counting the number of people who are destitute by a common global standard. The poverty headcount ratio for the International Poverty Line is the most widely used indicator for measuring absolute poverty.

Relative Poverty, on the other hand, is measured relative to living standards in a particular society, and varies both across time and between societies. The idea behind measuring poverty in relative terms is that the degree of deprivation depends on the relevant reference group; hence, people are typically considered poor by this standard if they have less income and opportunities than other individuals living in the same society.

In most cases, relative poverty is measured with respect to a poverty line anchored to the median income in the corresponding country (i.e. people are poor if their income is below a certain fraction of the income of the person in the middle of the income distribution). Because of this, relative poverty is actually a metric of inequality – it measures the distance between those in the middle and those at the bottom of the income distribution.

Relative poverty can be measured using the poverty headcount ratio and the poverty gap index. Indeed, these indicators are common in Europe.[31] However, it is important to bear in mind that these are not comparable to the estimates published by the World Bank – the nature of the poverty line is different.

V.2 How do researchers reconstruct historical poverty estimates?

Historical estimates of poverty come from academic studies that reconstruct income levels in the past, using cross-country macro estimates on economic output and inequality.

A seminal paper following this approach is Bourguignon and Morrison (2002)[32] and their work is the source of the estimates for the time 1820 to 1970 shown above. Bourguignon and Morrison's starting point is to estimate the global distribution of incomes over time. The change of extreme poverty is then calculated via changes in the share of the world population with incomes below the poverty line, according to the corresponding estimated distribution of incomes.

Bourguignon and Morrison (2002) rely on three types of data in order to estimate the distributions of income: economic output (real GDP per capita), population and inequality. The first two sources provide information regarding 'the size of the pie', while the third one provides evidence regarding the distribution of that pie.

The approach outlined above leads to a natural question: How can researchers construct economic output for the distant past? Fouquet and Broadberry (2015)[33] provide a detailed account of how economic historians construct these estimates. It is painstaking work with which researchers occupy themselves for years. The generally preferred approach to estimating national income is the output approach, which relies on historical records by economic sector. For example, for agricultural production, researchers use church records for the estates of farmers, as well as accounting documents produced by farmers and kept in local record offices. Agricultural outputs are then calculated by multiplying the acreage for each crop by the yield per acre. Once this is established, prices for individual crops and animal products are used to convert the output into current prices and create weights for an 'agricultural real output index'. Outputs related to other sectors, such as leather and food processing, are estimated using a similar approach applied for the specifics of each sector. Finally all these series are then brought together using a set of sectoral weights that capture the changing structure of the economy.

V.3 How does the World Bank estimate extreme poverty?

The World Bank is the most important institution measuring the extent of global poverty. The World Bank estimates of poverty are published via [redacted] and also in the World Development Indicators.

The World Bank estimates are produced from three key ingredients: household surveys providing evidence about household consumption per head (or, in some cases, income per head); domestic price indexes and purchasing power parity rates; and an International Poverty Line based on national lines in the poorest countries for which such lines are available.

Below we provide an overview of each of these ingredients. Ferreira et al. (2016)[34] provide further details.

Measuring consumption from household surveys

Consumption per capita is the preferred welfare indicator for the World Bank's analysis of global poverty.

Consumption is defined as "the use of resources whether acquired through purchase (expenditure) or through household production or provided from outside the household, such as by relatives, charities, or the government".[35]

In principle, one could use household surveys to estimate (i) resource outflows (monetary expenditures, home production and transfers); (ii) resource inflows (earnings and other non-market sources of income such as, again, home production and transfers); and (iii) change in assets between the beginning and end of the relevant period (including savings, owned durable goods, etc.).

Given all this information, consumption, as per the definition above, could be estimated directly from (i), or as the difference between (ii) and (iii). Either approach would give the same result. In practice, however, surveys on expenditures are different to surveys on incomes (more on this below).

For the majority of countries, the World Bank estimates consumption directly from household surveys on expenditures. For a significant minority of countries, however, the World Bank estimates are based on incomes. Notably, in both cases, the estimation methodology does include home production and transfers, by attaching monetary values to such non-market transactions.

How are monetary values placed on things like food grown at home and gifts from relatives? One common approach is to ask survey-respondents about the amount of such resources consumed over a given reference period. The aim is to then ascribe a monetary value to the reported consumption. This is done by multiplying the consumed amounts by extrapolated market prices. A second approach asks households directly about their own valuation of the amount of money they would expect to pay if they had bought such items themselves, or the amount of money they would expect to receive if they had sold these items. The second approach is commonly used to establish a rental equivalent for housing and durable goods owned by the household.

How are income and expenditure surveys actually conducted? Different countries use different surveying instruments, and while there is much scope for harmonization (see Beegle et al 2012[36]), there are some basic common features that allow for cross-country comparisons. In most cases, surveys are representative at the national level and record responses provided by 'primary respondents' such as the head of the household. Respondents report expenditures (or incomes) either by answering questions from memory (the 'retrospective recall method') or by consulting written records (the 'diary method'). In the case of expenditures, different reference periods are used to record responses across different categories of goods, with longer periods for goods or services that tend to be acquired less frequently.

Adjusting for differences in price levels

Income and consumption measures available from national household surveys are denominated in local currency units. This means that in order to make meaningful cross-country poverty comparisons, it is necessary to translate figures into a common currency – i.e. use a consistent 'unit of measure'.

One possibility would be to simply use the exchange rates from currency markets, to translate all national figures into one common currency – for example the US-dollars. This approach would however fail to account for differences in price levels: one US dollar allows you to achieve higher consumption in India than it does in the US.

If we are interested in material deprivation, any monetary income should be considered in relation to the amount of goods and services that it can buy locally. The World Bank's international poverty comparisons, therefore, rely on exchange rates based on purchase power parity conversion factors, rather than on market exchange rates. [redacted] "Purchasing power parity exchange rates, or PPPs, are price indexes that summarize prices in each country relative to a numeraire country, typically the United States. These numbers are used to compare living standards across countries, by academics in studies of economic growth, particularly through the Penn World Table, by the World Bank to construct measures of global poverty, by the European Union to redistribute resources, and by the international development community to draw attention to discrepancies between rich and poor countries."

PPP exchange rates allow translating monetary incomes (or consumption), from local currency units, into 'international dollars'. The idea is that a given amount of international dollars should buy roughly the same amount – and quality – of goods and services in any country.

As the graph below shows for GDP per head, assessing living standards using PPP adjusted international dollars rather than US market dollars can make a huge difference. When price levels in a country are much lower than in the US, using US dollars at market exchange rates will significantly underestimate the value of incomes.

PPP factors are estimated by the International Comparison Programme (ICP). The two last rounds of PPP factors estimated by the ICP are from 2005 and 2011; and the next one is scheduled for 2017.

In our entry on Economic Growth you can read more about PPP adjustments.

Setting the International Poverty Line

Today, the International Poverty Line is 1.90 international dollars (at 2011 PPP prices). Where does this number come from?

The pioneering work to count the number of people in poverty by a common global standard was published by Montek Ahluwalia, Nicholas Carter, and Hollis Chenery in 1979.[37] The three authors based their estimates of global poverty figures on the Indian poverty line at the time.

A global 'dollar-a-day' poverty line was introduced in the World Development Report 1990, and was subsequently used for the formulation of the Millennium Development Goals, through the commitment to "halve, between 1990 and 2015, the proportion of people whose income is less than $1 a day." Since then the International Poverty Line has been revised, and today it is based on the national poverty lines of a number of low-income countries.

The International Poverty Line is intended to be a global poverty line for absolute measurement of deprivation – so it is not recurrently adjusted as low-income countries grow richer. However, it is important to bear in mind that the International Poverty Line is sometimes updated; in 2015, for example, the line was updated from 1.25 international dollars (at 2005 PPP prices), to 1.90 international dollars (at 2011 PPP prices). The last update was made in order to incorporate new evidence on relative price levels, rather than to change the underlying real welfare standard used to define deprivation. In the last couple of revisions the guiding principle has been to incorporate new data on relative prices while attempting to minimize changes to the real welfare value of the line, so as to avoid "shifting the goalposts".

Below is a table, from Ferreira et al. (2016),[38] showing in detail how the International Poverty Line has been updated over time. The table also shows that the International Poverty Line is based on national poverty lines in fifteen countries.

The current methodology for choosing the set of countries used to define the International Poverty Line was first proposed by Chen and Ravallion (2001).[39] They compiled a set of national poverty lines for low-income countries – drawing from the World Bank's country-specific Poverty Assessments and the Poverty Reduction Strategy Papers done by the governments of the countries concerned – and found that while there was a positive association between the value of the poverty line and national per capita consumption for the large majority of countries, the relationship was flat for the fifteen poorest countries in their sample. In other words: they found that the poorest fifteen countries in their sample used a roughly similar absolute poverty line, independently of differences in their per capita consumption levels. These are the fifteen countries that were chosen as reference.

Most low-income countries, including those in the reference group, define their national poverty lines by relying on a version of the 'cost of basic needs' method – an approach that first stipulates a consumption bundle that is deemed adequate for basic consumption needs in the local context and then estimates the cost of this specific bundle.

What is an adequate consumption bundle? One common starting point is to rely on a generic food requirement, such as 2,100 calories per person per day, and then include a nonfood component that is added to reflect costs for housing, clothing, electricity, and so on.

Another approach – less common but also employed in practice – is to set absolute lines based on asking people what minimum consumption or income level they need just to make ends meet. Above we show that there is indeed a close relationship between the self-assessment of living conditions and the mean income in the society, both between and within countries.

You can read more about international poverty lines in the [redacted], pages 37 and 38.

Evolution of the World Bank's International Poverty Line – Ferreira et al. (2016)[40]

	1979 "India line"	1990 "Dollar-a-day"	2001 "1.08/day"	2008 "1.25/day"	2015 "1.90/day"
Source	Ahluwalia et al. (1979)	World Bank (1990)	Chen and Ravallion (2001)	RCS (2009)	Ferreira et al (2016)
Relative prices (ICP data)	1975 PPPs	1985 PPPs	1993 PPPs	2005 PPPs	2011 PPPs
National poverty lines used (#)	1 (India)	8 countries	10 countries	15 countries	15 countries (same lines as 2008)
Method	India's poverty line (46th percentile)	Inspection (rounded)	Median	Mean	Mean (rounded)
Poverty line (ICP base year USD)	$0.56	$1.01 ($1.00)	$1.08	$1.25	$1.88 (1.90)
Poverty line (Constant 1985 USD)	$1.12	$1.01	$0.8	$0.69	$0.91
National poverty lines used (countries)	India	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 2008

V.4 What are the main limitations of World Bank poverty estimates?

Above we discussed the methodology used by the World Bank to measure extreme poverty. Here we focus on the various limitations of this methodology. We follow the points discussed by Ferreira et al. (2016).[41]

Data deprivation

As mentioned above, one of the key ingredients for the World Bank's measurement of poverty are household surveys providing evidence about household consumption per head (or, in some cases, income per head).

The following map shows the availability of surveys used to construct the World Bank's poverty estimates.

For all countries that are shown in grey in this map there is not a single survey available to the World Bank in the last three decades. Many of these countries are rich countries in which extreme poverty is very low. But there is also missing data for some poorer countries, in which surely a considerable share of the population is living in extreme poverty.

As we can also see from this map, there are some countries with very few observations. This is the case for many African countries, where there is only one survey available in the last decade. This is extremely low, even in comparison to Latin America and Central Asia, where many countries have almost annual surveys.

For individual countries the World Bank publishes poverty estimates only for years in which household survey data is available. But for regional and global estimates, the World Bank publishes estimates every three years. Clearly, since not all countries have survey data for all years in which regional and global estimates are produced, the World Bank must rely on approximations. In their own words, they 'line up' country estimates to a reference year in order to produce regional and global totals.

The process of lining up estimates relies on interpolation for countries in which survey data are not available in particular years, but are available either before or after (or both). You can read more about this process in [redacted]. The bottom line is that the accuracy of these approximations relies heavily on the availability of survey data – the more survey years are available for a country, the more accurate the approximation.[42]

For low and middle income countries without reliable survey data in any year (mainly countries in the Middle East and North Africa), the World Bank chooses not to publish country-specific estimates, but still includes an approximated number in the regional and global totals, by relying on alternative econometric techniques.[43]

Comparability of income and consumption data

Consumption per capita is the preferred welfare indicator for the World Bank's analysis of global poverty. But not all national statistical agencies report to the World Bank consistent estimates of consumption based on expenditure surveys.

The issue is that national statistical agencies design and execute surveys to serve the specific needs and interests of each particular country; which means that different countries use different concepts, methods and questionnaire designs.

Ferreira et al. (2016)[44] show that approximately 75% of the countries in the PovcalNet database have data on per capita consumption, while the remaining countries – mostly in Latin America and the Caribbean – have income per capita.

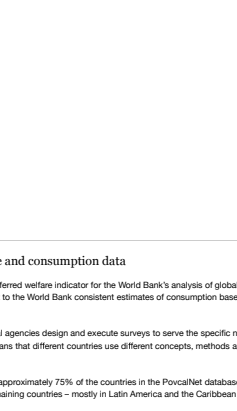
Income and consumption, as measured by household surveys, are not usually perfectly comparable. Despite efforts to broaden the definition of incomes for the purpose of measuring poverty, in many countries statistical agencies still use definitions that fail to account for 'non-income' resources such as savings and assets, borrowing, and some kinds of government welfare benefits.

The implication is that, by definition, zero income is a feasible value, while zero consumption is not a feasible value – people with zero consumption would starve. As one would then expect, this is reflected in the data. "There is essentially no mass point in any country with zero consumption, but many countries that use income data have a significant mass of zero incomes in the data, all of which are treated as being poor. Latin America, in particular, predominantly uses income to measure poverty, and in many countries there are at least a few percent of the observations that are zero".[45]

In richer countries, where 'non-income' resources such as savings, borrowing, and government welfare benefits are common, this issues of comparability can be substantial. Indeed, in rich countries such as the US, the problem of comparability is so substantial that the World Bank decides not to include estimates of extreme poverty in the global totals. This is a point we discuss below in more detail.

The following chart from Chandy and Smith (2014)[46] shows how income and consumption estimates differ, for the US and for Malawi.

Post-tax income and consumption per day across households, US and Malawi – Chandy and Smith (2014)[47]



Comparability of survey questionnaires and sampling

Above we point out that World Bank poverty estimates for some countries come from income data, while in other countries they come from consumption data. As it turns out, comparability issues arise even among countries that rely on consumption data from expenditures, since survey questionnaires are not always standardized.

Beegle et al. (2012)[48] give us a concrete idea of the extent to which survey questionnaires matter. They do an experiment in Tanzania, in which they randomly choose households and test eight alternative methods of measuring household consumption. They find significant differences between consumption reported by the benchmark personal diary and other diary and recall formats.

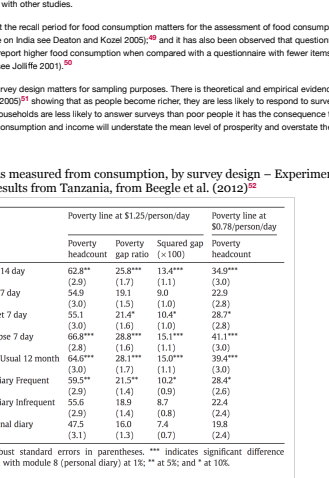
The table below summarizes the differences in measured poverty that arise from the various survey designs (here is an overview of the differences between questionnaires; more details in the paper). As we can see, the differences are substantial both for the headcount ratio and the poverty gap index.

These results are consistent with other studies.

Researchers have found that the recall period for food consumption matters for the assessment of food consumption in a population (for an example on India see Deaton and Kozel 2005);[49] and it has also been observed that questionnaires with more food items listed report higher food consumption when compared with a questionnaire with fewer items (for an example on El Salvador see Jolliffe 2001).[50]

Studies also suggest that survey design matters for sampling purposes. There is theoretical and empirical evidence presented by Korinek et al. (2005)[51] showing that as people become richer, they are less likely to respond to surveys. When richer individuals or households are less likely to answer surveys than poor people it has the consequence that survey-based estimates of consumption and income will understate the mean level of prosperity and overstate the share of people in poverty.

Poverty statistics as measured from consumption, by survey design – Experimental results from Tanzania, from Beegle et al. (2012)[52]



	Poverty line at $1.25/person/day			Poverty line at $0.78/person/day
	Poverty headcount	Poverty gap ratio	Squared gap (×100)	Poverty headcount
1. Long 14 day	62.8*** (2.9)	25.8*** (1.7)	13.4*** (1.1)	34.5*** (3.0)
2. Long 7 day	54.9 (3.0)	19.1 (1.5)	9.8 (1.0)	22.9 (2.8)
3. Subset 7 day	55.1 (3.0)	21.4* (1.6)	10.4* (1.0)	28.7* (2.8)
4. Collapse 7 day	66.8*** (2.8)	28.8*** (1.6)	15.1*** (1.1)	41.1*** (3.0)
5. Long Usual 12 month	64.6*** (3.0)	28.1*** (1.7)	15.0*** (1.1)	39.4*** (3.0)
6. HH diary Frequent	59.5** (2.9)	21.5** (1.4)	10.2* (0.9)	28.4* (2.6)
7. HH diary Infrequent	55.6 (2.9)	18.9 (1.4)	8.7 (0.8)	22.4 (2.4)
8. Personal diary	47.5 (3.1)	16.0 (1.3)	7.4 (0.7)	19.8 (2.4)

Note: Robust standard errors in parentheses. *** indicates significant difference compared with module 8 (personal diary) at 1%; ** at 5%; and * at 10%.

Exclusion of high-income countries

In the World Bank estimates of global extreme poverty, high-income countries are not accounted for. But how well does this simplifying omission capture the reality of people living there?

A simple look at the reality of homelessness in high-income countries shows that we need to take this question seriously.

The first point that we need to consider here is that the standards used by rich countries to measure poverty are substantially different to the standards used by the World Bank to measure extreme poverty in low and middle income countries.

Consider the case of the US. According to official estimates, the [redacted]. This figure is not really informative about extreme poverty relative to the International Poverty Line used by the World Bank: the official US poverty estimates refer to individuals living in households with incomes below a much higher threshold than the International Poverty Line. Allowances are made for the size and composition of households so that, for example, in a household with 2 adults and 2 children, the poverty line is roughly equivalent to $16.5 per person per day.

The second point to consider is that even if we try to apply the same standards used by the World Bank, the survey instruments in rich countries are not typically suitable to produce estimates that are comparable to those published by the World Bank. This has to do with a point we have already made above: in richer countries, where 'non-income' resources such as savings, borrowing, and government welfare benefits are substantial, it is not reliable to approximate consumption from income.

Keeping these comparability issues in mind, the World Bank does estimate poverty rates in high income countries, but chooses not to include them in the global figures. This can be confusing for researchers – including yours truly! The World Bank uses disposable income data to calculate extreme poverty figures that are published in PovcalNet, but chooses not to included them in the global poverty estimates (and in many other reports such as those relying on the World Development Indicators), due to lack of comparability.

The visualization below plots the available estimates of extreme poverty in rich countries, which can be obtained from PovcalNet with a disclaimer noting "*Although there are a number of people with household incomes below $1.90 per person in rich countries, estimated per capita consumption is above this threshold for nearly everyone. Countries of this type can't not be used in aggregation.*"

As we can see, the share of people living in 'World Bank type' extreme poverty in high-income countries is very small.

This is the same result that Bradshaw and Mayhew (2011)[53] find in a study commissioned by the European Commission, using data on per capita household incomes from the [redacted] survey to measure absolute poverty rates in Europe, using a poverty line of $2.15 PPP-dollars per person per day.[54] In this visualization you can see their results; and in this scatter plot you can see how PovcalNet estimates below compare to those by Bradshaw and Mayhew.

The conclusion is that although poverty measurement instruments in high income countries are not designed to be compatible with instruments in low and middle income countries, the available evidence suggests that 'World Bank type' extreme poverty is likely to be very low in rich countries.

You can read more about extreme poverty in rich countries in our blog here; and you can read about the link between homelessness and poverty in rich countries here.

V.5 How problematic are data limitations?

The above discussion of data limitations in the context of World Bank poverty estimates highlights an important fact: any estimate of poverty — of either its level or change over time — is surrounded by a margin of error.

Keeping in mind that the World Bank poverty estimates are only approximations is important when making policy decisions, as well as for academic research. Indeed, reviewing the many problems of poverty measurement Deaton (2010)[55] concludes that "probably the most urgent area for the poverty counts is not the [International Comparison Program], but the improvement in the consistency and timeliness of household surveys, and the upgrading of national accounts."

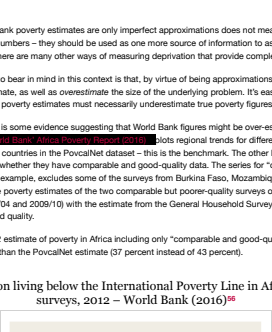
The fact that the World Bank poverty estimates are only imperfect approximations does not mean that these are meaningless or useless numbers – they should be used as one more source of information to assess living standards. As we point out above, there are many other ways of measuring deprivation that provide complementary information.

Another important point to bear in mind in this context is that, by virtue of being approximations, the World Bank poverty estimates can underestimate, as well as overestimate the size of the underlying problem. It's easy to forget about this and think that inaccurate poverty estimates must necessarily underestimate true poverty figures.

As a matter of fact, there is some evidence suggesting that World Bank figures might be over-estimates. The following visualization from the [redacted] plots regional trends for different subsets of countries. The green series plots all countries in the PovcalNet dataset – this is the benchmark. The other lines exclude different countries, depending on whether they have comparable and good-quality data. The series for "comparable and good-quality surveys only", for example, excludes some of the surveys from Burkina Faso, Mozambique, Tanzania, and Zambia; and replaces the poverty estimates of the two comparable but poor-quality surveys of Nigeria (Nigeria Living Standards Surveys 2003/04 and 2009/10) with the estimate from the General Household Survey Panel 2010/11, which has been deemed of good quality.

As can be seen, the 2012 estimate of poverty in Africa including only "comparable and good-quality surveys" is 6 percentage points lower than the PovcalNet estimate (37 percent instead of 43 percent).

Share of population living below the International Poverty Line in Africa, by sample of surveys, 2012 – World Bank (2016)[56]



V.6 What alternatives are there to estimate monetary poverty?

The poverty figures published by the World Bank are based on 'microeconomic data' – specifically household surveys as explained above. A second possibility to measure poverty is to start from 'macroeconomic data', particularly the National Accounts. This second approach was first explored by Ahluwalia et al. (1978),[57] and as we point out above, historical estimates of poverty, such as those from Bourguignon and Morrison (2002), also follow this approach.

While in theory national account measures of poverty should match those from household surveys, in reality there are often large discrepancies. Deaton (2005)[58] reviews the reasons for these discrepancies.

Given that both approaches are subject to measurement error, it is natural to wonder which, if any of the two methods is superior. Indeed, economists in recent years have started taking this question seriously: given the two approaches, how much weight should we give to national-account estimates vis-a-vis household-survey estimates?

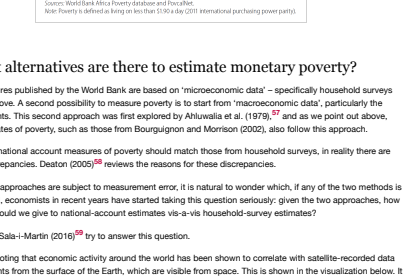
Pinkovskiy and Sala-i-Martin (2016)[59] try to answer this question.

They begin by noting that economic activity around the world has been shown to correlate with satellite-recorded data on nighttime lights from the surface of the Earth, which are visible from space. This is shown in the visualization below. It shows how economic activity, as measured by nighttime lights, changed in South Asia between the years 1994 and 2010. We can see that night lights in 2010 cover areas that were unlit in 1994; and there is also a substantial increase in the intensity of lights in major cities over the same period. This is clearly indicative of the underlying growth in economic activity that South Asia witnessed during this period.

Based on this correlation between nighttime lights and economic activity, Pinkovskiy and Sala-i-Martin evaluate the relative quality of aggregate income data generated by household surveys and national accounts. The intuition for their approach is that, as long as the measurement error in nighttime lights is unrelated to the measurement errors in either national accounts or survey means, one can use nightlights as a tool to see how much weight to give national accounts income estimates (relative to household-survey income estimates) in measuring true income.

The authors find that nighttime lights are much better correlated with GDP per capita than with survey means – which suggests, under their assumptions, that the optimal 'weights' to calculate aggregate income should be very large for national accounts and very modest for survey means.

Satellite images of South Asia by night



South Asia in 1994 | South Asia in 2010

Images are taken from Maxim Pinkovskiy and Xavier Sala-i-Martin (2016) – Lights, Camera … Income! Illuminating the National Accounts-Household Surveys Debate. The Quarterly Journal of Economics

VI. Data Sources

VI.1 Long-term development of global poverty

Bourguignon and Morrison (2002)

- **Data:** Several measures of poverty
- **Geographical coverage:** Global – by world regions/continents
- **Time span:** 1820 to 1992
- **Available at:** The research paper is: Bourguignon and Morrison (2002) – [redacted] In American Economic Review, 92, 4, 727–744.
- *These data were used above in the graph showing the declining share of people living in poverty since 1820.*

Economists Xavier Sala-i-Martin and Maxim Pinkovskiy estimated the share of the world population living in absolute poverty.[60]

An important recent paper on absolute poverty is Chen and Ravallion (2010) – [redacted]. In The Quarterly Journal of Economics, 125, 4, 1577–1625.

VI.2 Data on global poverty in recent decades

World Bank

- **Data:** Several measures of absolute poverty.
- **Geographical coverage:** Global – by country and world region.
- **Time span:** Since 1980
- **Available at:** World Bank's [redacted] – an interactive tool which visualizes absolute poverty and makes the data available for download.
- *There is a [redacted]*
- *The World Bank data on extreme poverty (% of people below 1.25$ a day) is also [redacted] where the relationship with other measures of wellbeing can be visualised.*

Data on the sub-national level (with huge coverage!) is [redacted]. These are data on the poverty headcount – at national poverty line, urban poverty line, and the rural poverty line.

Footnotes

Deaton, A., & Zaidi, S. (2002). Guidelines for constructing consumption aggregates for welfare analysis (Vol. 135). World Bank Publications. Available from https://openknowledge.worldbank.org/

Atkinson, A. (2016). Monitoring Global Poverty. Report of the Commission on Global Poverty. World Bank Group. Washington, DC. USA. Available online from https://openknowledge.worldbank.org/

Deaton (2010) – Price Indexes, Inequality, and the Measurement of World Poverty. In American Economic Review, 100, 1, 5–34.

This is taken from Deaton (2010) – Price Indexes, Inequality, and the Measurement of World Poverty. In American Economic Review, 100, 1, 5–34. The lightly-shaded circles are for 2006, the darker circles for 2007, and the darkest circles are for 2008.

Bourguignon, François and Christian Morrison. 2002. "Inequality Among World Citizens: 1820-1992." American Economic Review, 92(4): 727-744. DOI: 10.1257/00028280260344443 Freely online here.

According to the World Bank estimates shown here this was the global population in extreme poverty:

1990: 1,959,798,348 people

2015: 705,549,322 people

This is a decline by 1,254,249,026 people in 25 years.

Annual decline (on average): 50,169,961 people

Daily decline (on average): 137,452

Ravallion, Martin – Poverty in the Rich World When It Was Not Nearly So Rich. CGD; Online here.

The survey was conducted by MotivactionInt and is available for download. Oxfam published this summary of the survey results.

The data is taken from Hans Rosling (2013) – Highlights from Ignorance survey in the UK published at Gapminder.org.

Not all 2013 estimates in the 2016 data release are based on a survey conducted in 2013. However, estimates are interpolated between surveys to make figures comparable)

Newhouse, D. L., Suarez-Becerra, P., & Evans, M. (2016). New estimates of extreme poverty for children. Policy Research Working Paper 7845. World Bank Group. Available online here.

Castaneda, Andres; Doan, Dung; Newhouse, David; Nguyen, Minh Cong; Uematsu, Hiroki; Azevedo, Joao Pedro. 2016. Who Are the Poor in the Developing World?. Policy Research Working Paper;No. 7844. World Bank, Washington, DC. World Bank. Available online here.

Where 'low and middle income countries' are all countries except Australia, Belgium, Cyprus, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.

An individual is defined as having no education if she/he has never attended any formal school.

The source of the data is Newhouse, D. L., Suarez-Becerra, P., & Evans, M. (2016). New estimates of extreme poverty for children. Policy Research Working Paper 7845. World Bank Group. Available online here.

Data comes from surveys taken between 2009 and 2014, but all figures are lined up to represent the estimates of extreme poverty in 2013.

The source defines the universe of low and middle income countries as all countries except: Australia, Belgium, Cyprus, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.

This chart is Figure 7 in the Briefing Note UNICEF (2016), Ending Extreme Poverty: a Focus on Children; available here. The underlying source of data is Newhouse, D. L., Suarez-Becerra, P., & Evans, M. (2016). New estimates of extreme poverty for children. Policy Research Working Paper 7845. World Bank Group. Available online here.

Data comes from surveys taken between 2009 and 2014, but all figures are lined up to represent the estimates of extreme poverty in 2013.

The source defines the universe of low and middle income countries as all countries except: Australia, Belgium, Cyprus, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.

Chandy, L., Ledlie, N., & Penciakova, V. (2013). The final countdown: Prospects for ending extreme poverty by 2030.

Chandy, L., Ledlie, N., & Penciakova, V. (2013). The final countdown: Prospects for ending extreme poverty by 2030.

Alkire, S., & Foster, J. (2011). Counting and multidimensional poverty measurement. Journal of public economics, 95(7), 476-487

More details in Table 1, Kraay, A., & McKenzie, D. (2014). Do poverty traps exist? Assessing the evidence. The Journal of Economic Perspectives, 28(3), 127-148.

Kraay, A., & McKenzie, D. (2014). Do poverty traps exist? Assessing the evidence. The Journal of Economic Perspectives, 28(3), 127-148.

Kraay, A., & McKenzie, D. (2014). Do poverty traps exist? Assessing the evidence. The Journal of Economic Perspectives, 28(3), 127-148.

Banerjee, A., Duflo, E., Goldberg, N., Karlan, D., Osei, R., Parienté, W., ... & Udry, C. (2015). A multifaceted program causes lasting progress for the very poor: Evidence from six countries. Science, 348(6236), 1260799. Available online here.

Kraay, A., & McKenzie, D. (2014). Do poverty traps exist? Assessing the evidence. The Journal of Economic Perspectives, 28(3), 127-148.

Bryan, G., Chowdhury, S., & Mobarak, A. M. (2014). Underinvestment in a profitable technology: The case of seasonal migration in Bangladesh. Econometrica, 82(5), 1671-1748. Available online here

Clemens, M. A., Montenegro, C. E., & Pritchett, L. (2016). Bounding the price equivalent of migration barriers. Working Paper. Available online here

Ottaviano, G. I., & Peri, G. (2012). Rethinking the effect of immigration on wages. Journal of the European economic association, 10(1), 152-197.

Gentilini, Ugo, Maddalena Honorati, and Ruslan Yemtsov. (2014). "The state of social safety nets 2014." Washington, DC : World Bank Group.

Banerjee, A. V., Hanna, R., Kreindler, G., & Olken, B. A. (2015). Debunking the Stereotype of the Lazy Welfare Recipient: Evidence from Cash Transfer Programs Worldwide. Working Paper. Available here.

Blattman, C., & Dercon, S. (2016). Occupational choice in early industrializing societies: Experimental evidence on the income and health effects of industrial and entrepreneurial work (No. w22683). National Bureau of Economic Research.

There are two key indicators to measure poverty and social exclusion in Europe. The first one is based on the headcount of population "at-risk-of-poverty". This corresponds to people living in households with incomes below 60% of the national median equivalised disposable income. The 'equivalised disposable income' refers to income after applying equivalence factors to adjust for household composition, and after taking into account social transfers and taxes.

The other key indicator relates to 'material deprivation', and measures whether households can tick certain boxes, such as having certain goods (e.g. a washing machine, a TV, etc) or living in healthy environments (e.g. absence of pollution, noise, etc.)

In the Europe 2020 strategy, one of the key objectives is to reduce poverty by lifting at least 20 million people out of "the risk of poverty or social exclusion". Here, "People at risk of poverty or social exclusion" are those in at least one of the following three conditions: "at-risk-of-poverty after social transfers, severely materially deprived or living in a household with very low work intensity."

You can read more about poverty and material deprivation in Europe directly from Eurostat, where you can also find data for at-risk-of-poverty rates at different thresholds (40%, 50%, 60% and 70% of the national median equivalised household income), as well as at-risk-of-poverty rates that are 'anchored' at a point in time.

Bourguignon, François and Christian Morrisson. 2002. "Inequality Among World Citizens: 1820-1992." American Economic Review, 92(4): 727-744. DOI: 10.1257/00028280260344443 Free online here.

Fouquet, R., & Broadberry, S. (2015). Seven centuries of European economic growth and decline. The Journal of Economic Perspectives, 29(4), 227-244.

Ferreira, Francisco HG, Shaohua Chen, Andrew Dabalen, Yuri Dikhanov, Nada Hamadeh, Dean Jolliffe, Ambar Narayan et al. "A global count of the extreme poor in 2012: data issues, methodology and initial results." The Journal of Economic Inequality 14, no. 2 (2016): 141-172. An earlier version of the paper is online here.

Atkinson, A. (2016). Monitoring Global Poverty. Report of the Commission on Global Poverty. World Bank Group. Washington, DC. USA. Available online from https://openknowledge.worldbank.org/

Beegle, K., De Weerdt, J., Friedman, J., & Gibson, J. (2012). Methods of household consumption measurement through surveys: Experimental results from Tanzania. Journal of development Economics, 98(1), 3-18. Available online here

Ahluwalia, Montek S., Nicholas G. Carter, and Hollis B. Chenery. 1979. "Growth and Poverty in Developing Countries." Journal of Development Economics, 6(3): 299–341.

Ferreira, Francisco HG, Shaohua Chen, Andrew Dabalen, Yuri Dikhanov, Nada Hamadeh, Dean Jolliffe, Ambar Narayan et al. "A global count of the extreme poor in 2012: data issues, methodology and initial results." The Journal of Economic Inequality 14, no. 2 (2016): 141-172. An earlier version of the paper is online here.

Chen, S., & Ravallion, M. (2001). How did the world's poorest fare in the 1990s?. Review of Income and wealth, 47(3), 283-300.

Ferreira, Francisco HG, Shaohua Chen, Andrew Dabalen, Yuri Dikhanov, Nada Hamadeh, Dean Jolliffe, Ambar Narayan et al. "A global count of the extreme poor in 2012: data issues, methodology and initial results." The Journal of Economic Inequality 14, no. 2 (2016): 141-172. An earlier version of the paper is online here.

Ferreira, Francisco HG, Shaohua Chen, Andrew Dabalen, Yuri Dikhanov, Nada Hamadeh, Dean Jolliffe, Ambar Narayan et al. "A global count of the extreme poor in 2012: data issues, methodology and initial results." The Journal of Economic Inequality 14, no. 2 (2016): 141-172. An earlier version of the paper is online here.

PovcalNet explains the process of interpolation for missing reference years as follows: "When the reference year falls between two survey years, an estimate of mean consumption at the reference year is constructed by extrapolating the means obtained from the surveys forward and backward to the reference year. The second step is to compute the headcount poverty rate at the reference year after normalizing the distributions observed in the two survey years by the reference year mean. This yields two estimates of the headcount poverty rates in the reference year. The final reported poverty headcount rate for the reference years is the linear interpolation of the two. When data from only one survey year are available, the reference year mean is based on a survey mean by applying the growth rate in private consumption per capita from the national accounts. The reference year poverty estimate is then based on this mean and on the distribution observed in the one survey year. The better data coverage is in terms of number and frequency of available surveys, the more accurate this lining-up process is and the more reliable the regional estimates will be."

PovcalNet explains this as follows: "As part of this new round of global poverty measurement, a detailed reassessment of the 2011 PPPs has been conducted for Egypt, Iraq, Jordan, and the Republic of Yemen. It found that the coverage and quality of the 2011 PPP price data for most of these countries were hindered by the exceptional period of instability they faced at the time of the 2011 exercise of the International Comparison Program. Moreover, the poverty estimates resulting from using alternative regression-based PPPs still seem to underestimate poverty severely in these economies, as well as in Lebanon and the Syrian Arab Republic (but not in West Bank and Gaza). In the Middle East and North Africa region, the exclusion of Egypt, Iraq, Jordan, and the Republic of Yemen and the lack of recent data on Algeria and Syria imply that the remaining countries account for only a third of the region's population, below the 40 percent threshold of regional population coverage needed to report region representative estimates.
Adding to this low coverage is the fact that the failure to include data on Egypt, Iraq, and the Republic of Yemen and the lack of recent data on Syria, which are likely to face increasing poverty rates due to instability and civil conflicts, will seriously underestimate regional poverty rates.
As a compromise between precision and coverage, the regional poverty totals and headcount ratios are not reported for the Middle East and North Africa, but an estimate of the number of the poor is included in the global total (based on regression-based PPPs and 2011 PPPs, depending on the country)."

Ferreira, Francisco HG, Shaohua Chen, Andrew Dabalen, Yuri Dikhanov, Nada Hamadeh, Dean Jolliffe, Ambar Narayan et al. "A global count of the extreme poor in 2012: data issues, methodology and initial results." The Journal of Economic Inequality 14, no. 2 (2016): 141-172. An earlier version of the paper is online here.

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