

Are our inequality indicators biased?

By [Guillaume Allègre](#)

The issue of inequality is once again at the heart of economists' concerns. Trends in inequality and its causes and consequences are being amply discussed and debated. Strangely, there seems to be a relative consensus about how to measure it [1]. Economists working on inequality use in turn the Gini index of disposable income, the share of income held by the richest 10%, the inter-decile ratio, and so on. All these measures are relative in character: If the income of the population as a whole is multiplied by 10, the indicator doesn't change. What counts is the income ratio between the better off and the less well off. But could inequality and the way it changes be measured differently?

France's [inequality monitoring body](#) is currently discussing not only trends in the income ratio between the more and less well-off, but also changes in the income gap: "In one year, the richest 10% receive on average about 57,000 euros, and the poorest 10% 8,400 euros: a difference of 48,800 euros, equivalent to just over 3.5 years of work paid at the minimum wage (*Smic*). This

gap rose from 38,000 euros in 1996 to 53,000 euros in 2011, then fell to 48,800 euros in 2017." Measuring changes in the income

gap does not seem relevant. Let's take two people with incomes of 500 and 1,000

euros, then multiply their incomes by 10: the income ratio is stable, but the

income gap is multiplied by 10. Has inequality increased, is it stable or has

it decreased? Using the income gap as a measure, it has increased, but it is

stable according to the ratio. We believe it may have actually decreased.

Indeed, in France

today, the differences in living conditions, lifestyles and well-being are perhaps

greater between someone with an income of 500 euros, which leaves them in dire poverty,

and someone with an income of 1,000 euros, which puts them at the poverty line,

than between a person with an income of 5,000 euros, who can be described as

well-off, and a person earning 10,000 euros, who can be described as very

well-off. These last two people share similar lifestyles, even if the latter probably

lives in a slightly larger and better-situated home, and frequents more

luxurious restaurants. In other words, subtracting 10% of income from a very

wealthy person probably has less impact than subtracting 10% from someone at the

poverty line. There is abundant literature on risk aversion showing that people

are willing to pay more than 10% of their income when it is high to protect

against a 10% drop in income when it is low. This is, moreover, *one* of the justifications for a progressive tax: a greater percentage is taken from the better off, but the sacrifice is supposed to be equal because, according to marginalist theory, contributive capacity grows faster than income (or utility increases less than proportionately compared to income).

If this argument is accepted, we could conclude that at a constant level of relative inequality (Gini index, income ratio between the richest and poorest), *all other things being equal*, a richer society would in practice be more egalitarian, in the sense that its citizens share a more comparable way of life or well-being. Intuition tells us that this is true for large gaps in wealth (such as the 10-fold increase in earnings in the example above). If this is true, then comparisons of relative inequality made over very long periods of time or between developed and developing countries need to be kept in perspective. When [Thomas Piketty](#) shows that the richest 10% captured 50% of income between 1780 and 1910, we could then conclude that inequality has decreased over that period!

[Milanovic](#) and [Milanovic, Lindert and Williamson](#)

have developed concepts that take into account this wealth effect over a very long-term historical perspective: the “inequality frontier” is the maximum

inequality possible in a society taking into account the fact that the society must guarantee the livelihoods of its poorest members (the minimum income to live): in an economy with very little surplus (where the average discretionary income is low), the maximum possible inequality will be low [2]; in a very well-off economy, the maximum possible Gini coefficient will be close to 100 percent [3]. The “extraction ratio” is the current Gini divided by the maximum possible Gini. The wealthier a country is, the lower the maximum possible Gini coefficient, and the more – at equal Ginis – the extraction ratio will be low. One could also calculate a “discretionary income Gini” (in the sense of disposable income minus the minimum subsistence income) [4].

It can be argued that when comparing inequality in two societies at different levels of development, the extraction ratio is a better indicator of inequality than the available income Gini [5] or other indicators of relative inequality. One conclusion reached by Milanovic et al.: “Thus, although inequality in historic preindustrial societies is *equivalent* to that of industrial societies today, ancient inequality was much larger when expressed in terms of maximum feasible inequality. Compared to the maximum feasible inequality, current inequality is much lower than that in ancient societies”. According to the authors, in the early 2000s, the maximum possible Gini was

55.7 in Nigeria and 98.2 in the US: the comparison of inequality between the two countries will then be very different depending on whether the indicator chosen is the income Gini or the extraction ratio. On the other hand, there will be little difference between the United States and Sweden (maximum achievable Gini of 97.3) despite an average income difference of 45%. The effect is in fact saturated since the Swedish income is already 40 times the subsistence minimum (400 dollars per year in purchasing power parity) and the American, 58 times. In the authors' approach, the subsistence minimum is set in purchasing power parity and is fixed between countries and over time. But is the subsistence minimum really 400 dollars a year in Sweden today? When comparing inequality in the United States and Sweden today, is this subsistence minimum relevant? Taking a significantly higher minimum level of subsistence could change the comparison of inequality, even in developed countries (for a comparable living standards Gini, is Switzerland really more egalitarian than France?). The problem then is to establish a minimum subsistence income amount [\[6\]](#).

The choice of an inequality indicator depends on the objective pursued. If the idea is to compare inequalities in living conditions across time or between countries, the discretionary income Gini might be relevant. On the other

hand, if there is concern that excessively high incomes present a danger for democracy (a position developed in particular by Stiglitz in [The Price of Inequality](#)), the measure of relative inequality as calculated by the share of income captured by the wealthiest 1% seems more relevant.

When comparing countries that are closely related in terms of development, there are other, perhaps more important, limitations to comparing living standard Ginis. Given the same income inequality, a country where public spending on health, housing, education, culture, etc. is higher will (probably) be more egalitarian (unless public spending goes disproportionately to the better off). The issue of housing is also important, as it weighs heavily in household budgets: all other things being equal, high rents due to a constrained housing supply will increase inequality (tenants are poorer on average today). But it is difficult to take into account this effect in comparisons or trends, because the price of housing may reflect an improvement in quality or better amenities. In addition, inequality between landlords and tenants is not taken into account in the usual calculation of the standard of living: with equal income, an owner who has finished repaying the mortgage is better off than a tenant, but the fictitious rent that the owner receives does not enter the calculation of their standard of living.

Finally, and without being exhaustive, the issue of hours of work and household production also complicates the equation: a difference in income can be linked to a difference in working hours, especially if one of the spouses in a couple (most often the woman) is inactive or works part-time. However, the inactive spouse can engage in household production (including childcare) that is not taken into account in statistics: the difference in standard of living with the bi-active couple is less than what is implied by the difference in incomes. Statistics do not usually take this effect into account because it is difficult to assign a value to household production.

It can be seen that the measurement of income and the standard of living, and therefore inequality, is imperfect. The wealth effect (at an equal standard of living Gini, a richer society is probably more egalitarian, all things being equal) is a limit, among others, some of which are probably more important when comparing developed economies. On the other hand, this wealth effect could be relatively significant if one wants to compare inequalities in living conditions between the France of 1780 and that of 1910 and a fortiori of today.

[\[1\]](#) Whereas it was prominent from the early 1970s to the end of the

1990s: see in particular the work of Atkinson, Bourguignon, Fleurbaey and Sen.

[\[2\]](#) Milanovic et al.

give the following example: consider a society of 100 individuals, 99 of whom are in the lower class. The subsistence minimum in this society is 10 units and the total income 1,050 units. The sole member of the upper class receives 60 units.

The Gini coefficient associated with this distribution (the maximum possible Gini) is only 4.7 percent.

[\[3\]](#) In fact, the

maximum possible Gini rises quickly: if in the previous country, the income increases to 2,000 units and the dictator extracts all the surplus (1,010 units), the Gini leaps to 49.5.

[\[4\]](#) The disposable

income Gini, or the extraction ratio, shares some of the characteristics of the

[Atkinson](#)

[index](#), including the idea of differentiating among the wealthiest

and the poorest. Nevertheless, the Atkinson index remains a relative indicator

of inequality: if all incomes are multiplied by 10, the indicator remains

constant. The index satisfies average independence, which is generally sought

among inequality indicators, but which we seek to go beyond here.

[\[5\]](#) The two indicators

do not measure the same concepts. First, it may be interesting

to use several indicators, but multiplying the number of indicators raises the problem of readability, so one must choose. The choice of an indicator is based on a normative judgment since, at least implicitly, the idea is to reduce inequality according to the measure chosen (there is a consensus among economists that, all else being equal, less inequality is preferable).

[\[6\]](#) Especially since this income must be consistent over time or between countries if the objective is to capture a trend or make a comparison.