LA LETTRE DU CEPII

CENTRE D'ETUDES PROSPECTIVES ET D'INFORMATIONS INTERNATIONALES

No 242 – February 2005

Global Inequality: Weights and Measures[1]

Indicators of inequality across the world show trends which seem to be contradictory. In fact, they are based on different concepts. The types of information they provide are therefore complementary. Inequality in the per capita GDP of more than 150 countries is rising, but this does not prevent the majority of the world's population from belonging to countries whose average incomes are converging. To obtain a more complete image of world inequality it is, however, necessary to look beyond national averages and take into account within-country inequality. Here estimates differ due to the data and statistical methods used. Nevertheless, they suggest that since the mid-1990s world inequality has been falling from previous, very high levels, because of its international component. In contrast, the world average of within-country inequality is increasing.

The changes in inequality across the world hold a central place in the public debate on globalisation. Even leaving aside the question of whether there is a link between the two phenomena, the debate is far from leading to a consensus, as there is no single indicator of inequality. Instead there are many, based on different concepts and which may therefore lead to apparently contradictory conclusions. Research carried out using data available up until the late 1990s highlight three major phenomena which characterised the previous two decades:

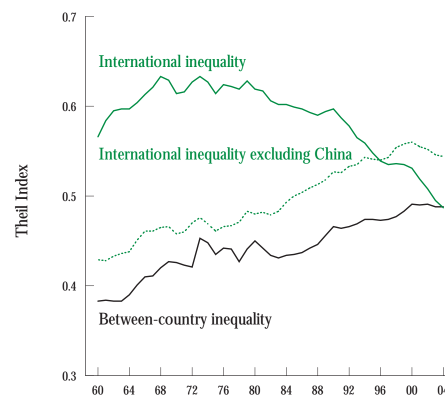
- a fairly regular rise in inequality between countries, that is an increase in the composite indicator of differentials in GDP per capita at purchasing power parity, for more than 150 countries;[2]
- a fall in *international inequality*, that is to say a fall in the same indicator, but weighting each country according to its share of the world population;
- lastly, a rise in the world average of within-country inequality.

How are such results and more recent data to be interpreted? Since peaking in 2000, inequality between countries is no longer rising. International inequality which marked step during the second half of the 1990s, has been falling since 2000, and not only because of China's catching up.

Two Contradictory Tendencies?

From the early 1960s through to the 1980s, international inequality (the weighted indicator) was considerably greater than inequality between countries (the non-weighted indicator), due to the low income of the two demographic giants, India and China. But the two indicators evolved more or less in parallel. Thereafter, these trends began diverging significantly, with the change in the weighted indicator becoming far more encouraging: while inequality between countries has continued to rise, international inequality has actually fallen (Graph 1).

Graph 1 – Between-country and international inequalities



Source: Author's calculations based on CHELEM-PIB.

1. This issue of the *Lettre du CEPII* revises and completes: I. Bensidoun (2004), "L'imbroglio des inégalités", in CEPII, *L'économie mondiale 2005*, Repères, La Découverte.
2. The Theil index is used here to measure inequality.

Given this divergence, some authors have deemed it useful to disqualify one of these two indicators. Thus, according to X. Sala-i-Martin, considering an unweighted indicator (which assigns *de facto* the same weight to each country, whatever its population size) is an "error that gives a misleading message".[3] This point may be disputed.[4]

Let us take an example: in Group A, per capita income is $1, while in Group B it is $10. The income inequality between the two groups is independent of the number of people in each.[5] The relevance of examining these two groups may be questioned, but the observation of their relative position cannot. When looking at inequality between countries, it must be asked whether "countries" are pertinent entities or not. They clearly are when examining phenomena which are affected by national policies. Empirical studies on growth do use an equal weighting to test the impact of economic policies or to establish whether convergence is occurring between countries or not.[6] Furthermore, the rise of inequality between countries is nothing more than the reflection of the conclusions reached in the abundant literature on convergence, which points to the lack of any systematic process of poor countries catching-up with rich ones.

If instead of looking at national macroeconomic situations, it is the international distribution of incomes which is examined (with countries still remaining the entity to be analysed), then it may be desirable to weight the influence of each country according to its population size.[7] In fact, such a weighted calculation is mainly used to deal with the exceptional economic catch-up of the most populated developing country, namely China. Common sense demands that an *international* indicator of inequality takes into account this demographic dimension.

At the same time however, weighting China's catch-up also runs the risk of "crushing" all other information and losing the composite dimension of the indicator, precisely because of this country's population size. In fact, there is a huge difference in international inequality when calculated with or without China, since its take-off at the beginning of the 1980s. China aside, international inequality displays a trend which is similar to inequality between countries and which continued to rise through to 2000.[8] It therefore seems wiser to consider the two indicators as complementary rather than to prefer one to the other: the non-weighted indicator makes it possible to judge whether the phenomenon observed with the weighted indicator is general, or whether it reflects the evolution of one or several highly-populated countries.

Still, the indicator of international inequality is conceptually ambiguous: by taking into account the population sizes, the strict notion of inequality across countries (where only "countries" count) is discarded in favour of examining inequality among individuals, but without actually reaching this fully. International inequality takes into account the number of individuals who share national incomes but not what happens to the income of the individuals. Implicitly this assumes that all individuals have obtained the average national income: within-country inequality is ignored. To get fully to the notion of inequality among all individuals in the world, in other words to measure "world inequality", it is necessary to observe the distribution of individual incomes. Per capita GDP data are therefore no longer appropriate, and the construction of an indicator of world inequality raises numerous statistical difficulties.

Three Different Estimations

Ideally, to assess world inequality, it would be necessary to have a world-wide household survey. For lack of such data, estimations are made using results obtained from national surveys. Data are aggregated for each country into a certain number of quantiles. The indicator of world inequality is calculated on the basis of the average income of each quantile, weighted according to its corresponding population. Given that the Theil index may be broken down, it is then possible to distinguish the influence on world inequality of the spread in average incomes across countries (international inequality) on the one hand, and of inequality within countries (within-country inequality) on the other hand.

The assessments of world inequality vary considerably for various reasons: the sources used by different authors (much depends on whether they use detailed household survey data or already-aggregated data to construct quantiles), the number of countries, and the approximations made to construct long term and country-wide series.

3. X. Sala-i-Martin (2002), "The Disturbing 'Rise' of Global Income Inequality", *NBER Working Paper* 8904. See also the more polemical: IMF Economic Forum, "Is Global Inequality Rising?", Transcript, Washington, 8 October 2002, or P. Trainar (2004), "La mondialisation fait reculer la pauvreté !", *Sociétal*, n° 43, 1st quarter.

4. On the significance of the two indicators see B. Milanovic (2001), "World Income Inequality in the Second Half of the 20th Century", *mimeo*, World Bank, March; F. Bourguignon, V. Levin & D. Rosenblatt (2004), "Declining International Inequality and Economic Divergence: Reviewing the Evidence Through Different Lenses", *Economie Internationale*, n° 100, 4th quarter.

5. M. Ravallion (2004) *op. cit.*.

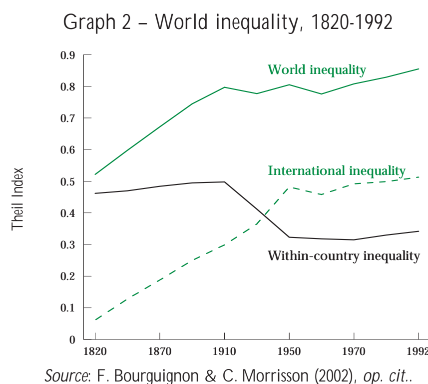
6. It is always possible to exclude countries when it is felt that their population is too small for the country to provide useful information from a general point of view.

7. On this point, see notably F. Bourguignon *et al.* (2004) *op. cit.*.

8. There has been a fall in international inequality after 2000 even excluding China, which may be explained by India's catch-up. When China and India are left aside, international inequality remains stable.

Among the much-quoted estimates, the one made by Bourguignon and Morrison[9] has a long term, historical perspective: 1820-1992 (Graph 2). It shows a strong deepening in inequality during the 19th century, followed by a stabilisation during the first half of the 20th century, which in turn has been succeeded by renewed deepening since 1960. The major difference between the 19th and 20th centuries concerns the respective contributions of international and within-country inequality: in 1820, the latter accounted for nearly 90% of world inequality. By 1929 its share had fallen to 53%, with a further decline to 40% by 1950, which was still the level observed in 1992. Since 1970 however, the renewed increase in within-country inequality explains a large part of the rise in world inequality, which has reached a very high level.

Graph 2 – World inequality, 1820-1992



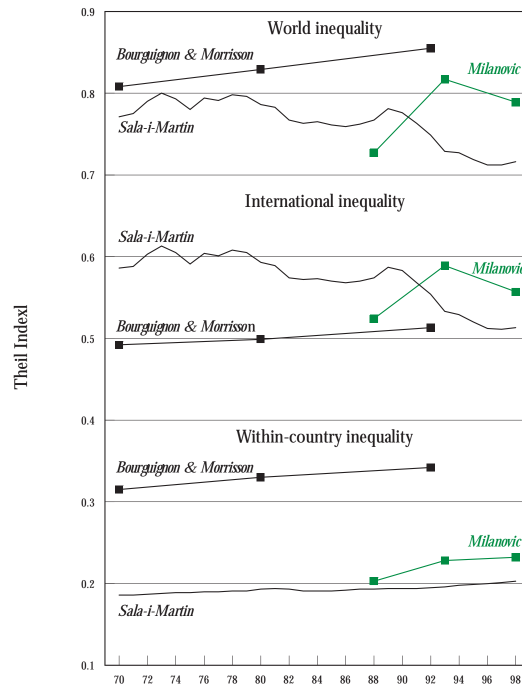
Source: F. Bourguignon & C. Morrisson (2002), *op. cit.*.

The trends observed for the 1970s and 1980s by Bourguignon and Morrison need, however, to be confirmed. Many assumptions had to be made to obtain their long term series,[10] so that their estimation is *a priori* less pertinent than those which, focused on recent decades, use more detailed data.

Among these, the estimation by X. Sala-i-Martin[11] is the most attractive, due to the period it covers (1970-1998). Maybe the result it provides, namely a significant fall in world inequality, contributes to its popularity.[12] In contrast, B. Milanovic estimates that there was a marked rise in inequality between 1988 and 1993, followed by a slight fall between 1993 and 1998 (Graph 3).

Several differences in the two estimations explain this disagreement. Sala-i-Martin's calculations, which relate to 125 countries, are based on many approximations and audacious assumptions:[13] among all the data used, only 15% are really available (as opposed to being "constructed" or

Graph 3 – Three estimates of world inequality and their components



Sources: F. Bourguignon & C. Morrisson (2002), *op. cit.*; X. Sala-i-Martin (2002), *op. cit.* and B. Milanovic (2005) *op. cit.*.

omitted).[14] On the other hand, Milanovic's estimation, which relates to 86 countries, draws only on available data, but, as a result, the time scale is reduced.[15]

Furthermore, the estimation by Sala-i-Martin uses national data by quintiles. This breakdown of data, however, is not sufficiently detailed to ensure that the estimation is not too far from the "true" value of the indicator which individual data would give. Indeed, within a quantile, all individuals are assumed to have the same income: the greater a class's population – either because the total population is large (as in the case of China, for example) or because the class size itself is large (using quintiles instead of deciles) – the greater the risk of bias. Thus Sala-i-Martin's use of data which is excessively-aggregated, especially for countries which, because of their size, are particularly influential in calculating the indicator, do not allow him to gauge within-country inequality correctly. As a result, the information given by his indicator of world inequality is ultimately more an indicator of international inequality. Consequently, this estimation merely finds for world inequality what has been observed for international inequality, namely a strong fall in inequality due to China's catch-up.

9. F. Bourguignon & C. Morrison (2002), "Inequality Among World Citizens: 1820-1992", *American Economic Review*, No 4, September.
10. For example, assuming that one country's income distribution may be applied to another where data is missing, or assuming that a country's income distribution remains constant over a relatively long period of time.
11. X. Sala-i-Martin (2002), *op. cit.*.
12. See notably J. Bhagwati (2004), In *Defense of Globalization*, Oxford University Press.
13. See B. Milanovic (2002), "The Ricardian Vice: Why Sala-i-Martin's Calculations of World Income Are Wrong", *mimeo*, Development Research Group, World Bank.
14. For 28 countries out of 125, the author has only average per capita income; quintiles are only available for one year for 29 countries; and for the remaining 68 countries, quintiles are only available on average for 5 out of 27 years.
15. B. Milanovic (2005), *Worlds Apart: Measuring International Global Inequality*, Princeton University Press.

Milanovic's approach also differs clearly on this point, as he uses more than ten income classes per country.[16] In addition, he makes a distinction between urban and rural populations in highly populated countries (China, India, Indonesia, Bangladesh), which effectively means taking into account two Chinas (one rural, the other urban), two Indias, *etc.* To be sure, this affects the breakdown between within-country inequality and international inequality: part of the inequality which should be considered as within-country (relating to China, for example) will be classed as international inequality (between the two Chinas and between the two Chinas and other countries). Such a "correction" is nevertheless essential in order to limit the bias which arises when data is insufficiently detailed.

Indeed, between 1988 and 1993, the diverging trends between rural Asian incomes and those of the rich OECD countries, on the one hand, and between the incomes of urban Chinese and those of rural Chinese and Indian, on the other hand, are responsible for a large part of the rise in world inequality. In the following period (1993-1998), the income differences between urban and rural Asia further contributed to rising inequality, while the gaps between people living in rich countries and in rural India, and especially in rural China diminished, leading therefore to a decline in world inequality.

A Tentative Summary

Globalisation is not global, if it is held to be a movement which extends capitalism to poor countries, and leads their living standards to catch-up with those of the rich countries: some poor countries are excluded from the process, while some "intermediate" countries have regressed.[17] Overall, inequality between countries is deepening, and it is still too early to see whether the plateau reached by the indicator since 2000 actually constitutes a break with previous trends.

However, China's catch-up, and more recently India's too, means that the majority of the world's population lives in countries whose average incomes are tending to converge. This of course says nothing about trends in individual incomes, and this observation is indeed good news only if it is assumed that such catching-up benefits a large majority of people.

When looking at the world as a whole and trying to compare incomes within the world population, the diagnosis becomes more hazardous, given statistical difficulties. Based on the work by Bourguignon and Morrisson as well as that of Milanovic, it may be considered that world inequality rose between the beginning of the 1970s and the beginning of the 1990s, in part because of greater within-country inequality.[18] More recently, there has been a fall in world inequality. To be sure, relative income gaps between the rich and the poor are increasing at the domestic level, especially in the poor, highly-populated Asian countries. Nevertheless, progress made in the incomes of the poor in Asian countries has reduced the gap between them and the populations of the rich countries.

From an economic policy point of view, these results do not all have the same consequences. The social and political impact of gaps between rich and poor within a country is certainly more sensitive than the gaps between the poor of low income countries and the inhabitants of high income countries. From this perspective, while the fall in the indicator of world inequality is to be welcomed, the fact that the world average of within-country inequality is worsening is undoubtedly a matter of greater concern.

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16. The number of income classes varies from country to country. It was 10.8 on average in 1988, 11.4 in 1993 and 15.1 in 1998.
17. See I. Bensidoun (2004) *op. cit.*.
18. See Graph 3. It should be remembered that in B. Milanovic's research, the breakdown of the large Asian countries into rural and urban areas means that some of the within-country inequality is actually accounted for as "international" in estimating world inequality.

LA LETTRE DU CEPII

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PUBLISHER:
Lionel Fontagné
Director of the CEPII

CHIEF EDITOR:
Agnès Chevallier

TRANSLATION:
Nicholas Sowels

DTP:
Laure Boivin

DISTRIBUTION:
La Documentation française.

SUBSCRIPTION only to the original, French version.
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WEB site: **www.cepii.fr**
ISSN 0243-1947

CCP n° 1462 AD
1st Quarter 2005
February 2005

Imp. ROBERT-PARIS
Imprimé en France

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