Average income inequality between countries (1700-2030)

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Introduction

1. The view that inequalities between and within countries around the world are ever increasing has dominated the media for quite some time. It is a view that is held by many journalists, anti-globalization activists, economists and international organisations and is based on the fact that inequalities have increased greatly since the start of the 19th century. Firebaugh (2003) cites many assertions on the growing inequality in average income between countries made by the World Bank, the IMF, UNDP and the WTO. Globalization, which began in around 1980, gathering pace from 1990, has often been accused as being the overriding factor in this process.   … / …

INTRODUCTION

1. The view that inequalities between and within countries around the world are ever increasing has dominated the media for quite some time. It is a view that is held by many journalists, anti-globalization activists, economists and international organisations and is based on the fact that inequalities have increased greatly since the start of the 19th century. Firebaugh (2003) cites many assertions on the growing inequality in average income between countries made by the World Bank, the IMF, UNDP and the WTO. Globalization, which began in around 1980, gathering pace from 1990, has often been accused as being the overriding factor in this process.

2. At the same time, however, emerging countries have been taking the lead in terms of economic performance. Indeed, whereas from 1950 to 1973, growth rates in West European countries, the United States and Japan were higher than in China, India and the USSR; from 1973 to 1990 China overtook these countries, with India maintaining the same performance and the USSR ranking behind. 1990 then marked a major breakthrough as from this date many emerging countries outperformed the "rich" countries. In fact, from 1990 to 2003, China and India overtook all of these countries and from 2003 the gap has continued to widen.

3. As a result, the debate on growing global inequality has taken a surprising turn. How can inequality be rising if "rich" countries are growing far less quickly than emerging countries? The fact that the average income of three billion individuals has risen two or three times more quickly since 1990 than those of 800 million individuals in rich countries contradicts both the theory that inequality is on the increase and that there is a positive relationship between inequality and globalization.

4. Yet at the same time, many poor countries, and Africa in particular, are experiencing stagnation, thereby increasing the difference in income between a billion poor people and 800 million rich individuals. Given this historically unprecedented situation, are we to conclude then that inequality is continuing to rise, that it has stabilised, that it has changed in nature (due to a growing disparity between rich and poor, while the gap is closing between rich countries and emerging countries) or that it is in fact decreasing as predicted by R. Lucas (2002) who argued: "The enormous inequality of the post-war period is at its all-time peak and will decline in the future until something like the relative incomes of 1800 are restored".

5. This first paper on inequalities in GDP per capita between countries aims to answer this question. A paper on how inequalities have changed within countries would provide a comprehensive assessment. Indeed, total inequality between individuals depends both on inequalities in average income between countries and inequalities within countries (which can vary in the same or in an opposite direction). Globalization, together with other factors, can affect both. The results of these analyses can be used to estimate global inequality between 1992 and 2008, as well as to predict how it will evolve up until 2030.

THE DATA

6. Two databases on the evolution of GDP per capita until 2030 were used. The first, prepared by Maddison (2007), is characterised by ongoing fast growth in developed countries and very small growth in African countries, while the second database, created by the OECD's Department of Economic Affairs, assumes that growth is slower in developed countries, but is distinctly higher in emerging countries and even in African countries.

Maddison's database

7. This database was initially reliant on predictions made by Maddison (2007), but these have since been corrected by the OECD Development Centre for the period 2003-2030. Maddison had in fact used the year 2003 as a reference in his work and chose growth rates for GDP per capita for 2003-2030 based on the rates observed before 2003. In 2010, however, the Development Centre had access to the growth rates observed between 2003 and 2008. The Centre therefore kept the estimates made by Maddison for 2030 and interpolated 2008 (observed GDP per capita)-2030 (predicted GDP per capita) thus modifying the annual figures, but retaining those from 2003 and 2030 published by Maddison (2007).

8. We have used the Centre's database without making any modifications (we would like to thank those responsible for this database, particularly Christopher Garroway de Coninck for sending it to us and explaining its genesis). It takes into account all data observed for population and GDP per country until 2008. As our initial database concerns 1820-1992, we kept the same classification per country or groups of countries. This means that for the former-USSR we kept the borders of the USSR and aggregated the data for the countries previously belonging to the USSR. We also kept three groups of countries for Latin America, Africa and Asia; each of them represent more than 40 countries. In 1992 these three groups account for 14% of the world population and 6% of the world GDP. These choices, linked to a very long historical period (we go as far back as 1700), present certain disadvantages, but they can be mitigated with additional information on the development of the largest countries which are included in these groups.

9. It is critical to indicate the main choices made by Maddison when estimating population and GDP because our estimates for global inequality in 2030 depend on them. For population, Maddison used the projections of the US Census Bureau's International Programme Department. These projections, which take into account migration, seem to be a reliable source and we have therefore used them for all our inequality estimates. We only note that this department assumed much higher birth rates (births per 100 inhabitants) in Sub-Saharan Africa in 2030 than in all the other regions, which explains the growth of the share of Africa in the world population between 2003 and 2030 (from 13% to 18%).

10. For growth in GDP per capita between 2003 and 2030, Maddison extrapolated the rates observed between 1990 and 2003, with some potential modifications which he explains. For the main European countries, the United States, Canada and Australia, he chose simple extrapolation

with a rate of 1.7%. He presumed a fall in China's growth rate (4.5% instead of 7.5%) for several reasons: the economy is approaching its technological frontier, and considerable investments are needed in health and education in rural areas as well as in the environment, which has deteriorated significantly. However, he chose a higher rate for India (4.5% instead of 3.9%) with an average income less than half that of China, explaining a bigger catch-up effect than in China. Having explained the causes of Russia's decline in 1990-2003, he assumes a rate of 3.5% due to its abundance of natural resources. Having described all the disadvantages holding back African countries, he justifies a low rate of 1% for 2003-2030.

11. This decision has a big impact on global inequality. The consequence of fast demographic growth coupled with slow GDP growth is a marked increase in the difference in GDP per capita in 2030 between "rich" countries, i.e. about one billion inhabitants and African countries, i.e. about 1.5 billion inhabitants. Therefore, in relation to the United States' GDP per capita, Asian countries and the countries of the former USSR catch up quickly, while only African countries experience a decline.

12. All of Maddison's data is expressed in 1990 dollars (Geary-Khamis PPP). Since then, we have new PPPs thanks to the 2005 ICP which covers a broader sample of countries and for the first time includes surveys in very large countries like China. Milanovic (2010) made a new estimate of global inequality using these new series which are very different for certain countries. For example, the GDPs per capita were revised downwards: - 38% in China and India. And the GDPs per capita of other countries like Bangladesh, the Philippines and Vietnam saw the same decrease. Now, since the estimated GDPs per capita in "rich" countries were hardly modified, this creates a sharp rise in global inequality. According to Milanovic, this increase reaches about 5 points for the Gini coefficient (from .65 to .70). However, this increase is almost constant for the 4 years (from 1988 to 2002) in which he estimates global inequality; therefore his translation of the graph of the Gini coefficients does not modify the evolution. We can therefore retain Maddison's 1995 PPPs, provided we are aware that the estimated Gini coefficients need to be increased by 5 points if we want to take into account the more representative and more reliable 2005 price comparison surveys.

The Duval-de la Maisonneuve (D-M) database

13. This database was created by economists from the OECD's Department of Economic Affairs for a project on climate change which ended with the publication of *The Economics of Climate Change Mitigation* (2009) and was the subject of an article by R. Duval and C. de la Maisonneuve in the *Journal of Policy Modeling* (2010). It uses an entirely different approach to that of Maddison for 2003-2030. The authors chose a Cobb-Douglas production function that has constant returns to scale with physical capital, human capital and labour as production factors and neutral technical progress. This function does not vary from one country to another or from one period to another. A series of physical capital stock was created. The human capital stock is estimated based on a database on number of years of education, which is converted into human capital using a hypothesis on the returns on education. Based on these two series and the population's

employment rate, the authors estimated the total factor productivity. The series include data observed until 2009. The data is extended to 2050 using alternative scenarios on employment, physical capital and human capital stocks and on the growth in the total productivity of these factors. We used the GDP per capita series created for 76 countries which represent over 90% of world GDP and population in 2005. These series are expressed in 2005 dollars with the new PPPs from the 2005 ICP. We used only GDP per capita variations in each country from 2008 to 2020 and 2030, i.e. two figures per country, retaining Maddison's GDP per capita in absolute value for 2008, to avoid any inconsistency.

14. We did not use the series prepared by Kharas (2010) to predict the proportion of the world population that belongs to the middle class (defined in absolute terms by two daily spending limits: 10 and 100 dollars, 2005 value) because these lead to an even greater reduction in global inequality. Kharas made predictions using a Cobb-Douglas function that has constant returns with three factors: capital, labour and technical progress (it does not take human capital stock into account like D-M). The UN's predictions are used for labour. Capital accumulation is calculated based on the same rate of investment as the average rate observed between 1998 and 2007. Finally, the productivity growth rate is estimated by assuming that the rate at which catch-up is achieved is inversely proportional to the difference in income per inhabitant between the country concerned and that of the United States. However, this convergence hypothesis is only applied to countries whose GDP per capita growth rate has exceeded 3.5% in the last 25 years, which leads us to include India, China, Russia and many Asian countries like Vietnam and Malaysia, and to exclude Latin American countries like Brazil and Mexico. The result is a GDP per capita growth in Asian countries that is much higher than that predicted by D-M. Over the 2005-2030 period, the GDP per capita multiplied by 6 to 9 according to Kharas, while it multiplied by 3 to 4 according to D-M. For these Asian countries, the GDP per capita we obtain is therefore twice as high, while the figures of D-M are already much higher than those of Maddison. By contrast, Kharas' growth forecasts for European countries, the United States and Japan are the same as those of D-M, as are those for countries like Brazil and Mexico. Such an increase in GDP per capita among countries which represent almost half the current world population would lead to an equally sizeable increase in the population belonging to middle class, and a reduction in global inequality that is even bigger than the one corresponding to the series produced by D-M.

15. To avoid overestimating the fall in global inequality, we chose the databases of Maddison and D-M, which give more plausible results. With these two databases we already obtain results that are markedly different, because emerging countries catch up with rich countries much faster with the D-M database than with Maddison's.

Table 1 shows that for 2008-2030 the growth of "rich" countries is lower in Western Europe and in the United States according to the D-M database than according to Maddison's. Conversely, growth in emerging countries and the developing countries is distinctly faster according to the D-M database: 1 point more in China and 1.6 more in India, which has a decisive impact on global inequality, and 1.4 point in Indonesia. The same is true for countries like Nigeria and Pakistan. It is impossible to justify the choice of a database with irrefutable arguments. Nonetheless, the IMF's forecasts for 2011-2015 classify 7 African countries among the 10 countries whose GDP will undergo the fastest growth. This corresponds to GDP per capita growth rates of around 4%, a figure that is much higher than Maddison's hypothesis. Among the 45 African countries from the group in our

database, we selected 12 whose population exceeds 10 million inhabitants. In these countries the D-M database anticipates a GDP per capita growth rate of 2.5%, again a figure that is significantly higher than Maddison's 1%. This comparison between the two databases for African countries is useful because African countries are classed among the poorest in the world distribution of countries according to their GDP per capita. The estimated growth rates for African countries therefore have a big impact on inequality and poverty in the world.

TABLE 1 – Estimated growth rates 2008-2030

	Maddison	**D-M**
US	1,7	1,4
Germany-France-UK	1,7	1,4
China	4	5
India	4	5,6
Indonesia	2,1	3,5
Pakistan	2,2	3,5
Nigeria	0,4	5,6

16. These 2011-2015 IMF forecasts for African countries and China (a rate of 8% instead of 4% according to Maddison for 2008-2030), lead us to believe that a GDP per capita halfway between the upper and lower hypotheses (D-M and Maddison) is certainly more plausible than the growth rate which corresponds to Maddison's database.

THE RESULTS

Rising global inequality in the 18th century

17. For 1700, we used the internal income distributions of 1820. Thanks to the study by Lindert, Milanovic and Williamson (2010) we have information on the evolution of the internal income inequality of several countries in our database. They indicate no significant similar variations that could cancel out the observed rise in inequality between countries.

18. The estimate of 1700 (table 2) proves that the high rise in global inequality in the 19th century actually dates back to the start of the 18th century. In a context where GDP per capita is stagnant or experiencing very little growth in the majority of countries, the 20 to 30% increases over 120 years obtained in the United Kingdom, France, Germany and in Latin American countries (Brazil and Mexico), and increases of over 100% in the United States and Canada, had an impact on inequality. Admittedly though the impact is small: the Gini coefficient rises from .476 to .492, the Theil from .481 to .513, while the share of the richest 20% rises from 44% to 46%. These modest variations compared to those of the 19th century confirm that the take-off of a few European countries and American colonies initiated a process that was to last three centuries, since a fall in global inequality does not become apparent until the end of the 20th century. We might be tempted to estimate the evolution of global inequality from the Renaissance or earlier, but these dates would not make sense because while a take-off occurs from the 16th century in many regions of Italy and the Netherlands, the GDP per capita in these countries is stagnant during the 18th century. It is only in the 18th century that we first see sustainable growth in a country over several centuries, related with industrialization procuring increases in productivity, never attained before. England quickly overtakes all other countries, retains this rank until the start of the 20th century and keeps it in Europe until the middle of the 20th century.

TABLE 2 – World distribution of income 1700-2030

	1700	1820	1870	1910	1960	1992	2000	2008	2020 Maddison	2020 D-M	2030 Maddison	2030 D-M
Lorenz curve												
20% lower	5	4.8	4	3	2.4	2.1	2.2	2.3	2.1	2.7	1.8	2.9
40% lower	14	13.7	11	8.8	6.8	6	6.6	7.4	7.3	8.5	6.9	9.3
60% lower	27.5	26.2	21.7	17.7	14.1	13	14	16.1	16.1	18.5	16.5	20.3
80% lower	46	44	38	33	31.9	27.5	28.4	32.4	33.0	36.0	33.1	38.6
Shares												
quintile 2	9	8.9	7	5.8	4.4	3.9	4.4	5.1	5.2	5.8	5.1	6.4
quintile 3	13.5	12.5	10.7	8.9	7.3	7	7.4	8.7	8.8	10	9.6	11
quintile 4	18.5	17.8	16.3	15.3	17.8	14.5	14.4	16.3	16.9	17.5	16.6	18.3
decile 9	13.5	14	14.4	16.1	18.1	18.2	17.8	17.4	17.6	17.5	17.2	16.3
decile 10	40.5	42	47.6	50.9	50	54.3	53.8	49.8	49.4	46.5	49.7	45.1
5% higher	31	31.8	33.4	36.6	34.1	37	36.7	33.5	33.4	31.4	33.5	30
Inequality indices												
Gini	0.476	0.492	0.559	0.610	0.635	0.666	0.655	0.622	0.619	0.588	0.624	0.565
Theil	0.481	0.513	0.670	0.797	0.776	0.883	0.856	0.749	0.739	0.658	0.748	0.603
MLD	0.391	0.415	0.544	0.668	0.766	0.860	0.820	0.731	0.744	0.638	0.783	0.580

19. The results obtained for 1820-1992 are almost the same as those published previously (B-M 2002). Small differences can be explained by the fact that Maddison revised his database between 1995 (reference date for the work which was used as a reference in the cited article) and 2008. For example, he significantly increased (up to 50%) the populations of many countries like Brazil, Indonesia, Mexico, Russia and Turkey. Such growth in countries where the GDP per capita is both constant and lower than the world average had the effect of increasing inequality.

Falling global inequality between 1992 and 2008

20. The estimates for world distribution of income presented in table 2 were made by assuming that internal income inequality do not change from 1992 to 2030, therefore this table only indicates the impact of variations in inequality between countries. However, these estimates are already of real significance because the main component (about 2/3) of total inequality stems from inequality between countries (B-M 2002). In fact, inequality within countries has increased since 1992 (as shown by document 2), although this variation seems quite small. These results from document 2 agree with those of Sala-I-Martin (2010) who estimated the evolution of internal inequality from several hundred household income and consumption surveys and for 1970-2006 obtained a very small rise in internal inequality, such that it only slightly reduces the distinct decline in inequality between countries estimated by this author.

21. The results for 1992-2008 based on observed data are relatively reliable. At constant internal inequality, the decline in inequality between countries had the effect of significantly reducing

global inequality: a decline of 7% from the Gini coefficient and 15% from the Theil index and the MLD. The share of the 10th decile falls by 4.5 points (from 54.3% to 49.8%) while that of the poorest 80% rises by 5 points. We must remember that we are not talking about the evolution in actual inequality between individuals since we have not taken the rise in internal inequality into account. The size of this decline, however, means that this opposite movement is not enough to cancel it out. It is the first time since the start of the 18th century that we have seen a clear decline in inequality between countries and it is to such a degree that inequality between individuals has also fallen, albeit to a lesser extent.

Changing global inequality from 2008 to 2030

22. The potential evolution for 2008 to 2030 depends on growth rate hypotheses. With a pessimistic hypothesis (Maddison's series) we would have, at constant internal inequality, stability for the Gini coefficient and the Theil index, while the MLD increases slightly, which means the share of low incomes (first quintile) is decreasing. This evolution would correspond to very small decreases for the shares of the 9th (17.4 to 17.2) and 10th decile (49.5 to 49.7). But the share of the first quintile also falls, which explains the stability of the Gini coefficient and the rise of the MLD. The beneficiaries of this change are those countries whose average income is close to the global median income, since the share of the 3rd quintile rises from 8.7% to 9.6%. They are the populations of emerging countries whose incomes are rising faster than those of both rich countries and poor countries.

23. On the other hand, according to the hypothesis of D-M, one would obtain with a constant internal inequality a large decline in world inequality between individuals: - 9% for the Gini coefficient and about - 20% for the Theil index and the MLD. The share of the 10th decile decreases by 5 points. Everyone benefits, including the poorest, as the share of the first quintile increases from 2.3% to 2.9%. The intermediate groups (quintiles 3 and 4) benefit greatly, each gaining almost two points. This decline in inequality in 22 years would be comparable in rate to that observed from 1992 to 2008. Yet these optimistic results must be qualified. They are based largely on hypotheses that relate to the three big groups of countries and notably on the growth of the group of African countries that represents a large proportion of this continent's population (55%). These hypotheses seem plausible for the two other groups of countries with a GDP per capita that would rise by 80-90% in 22 years. But for the group of African countries, we have assumed that GDP per capita would triple, with performances multiplying by 2 to 3.5 depending on the country. Due to the weight of this group of African countries in the poorest population in the world, these hypotheses have a decisive impact on the results. If we assume that for these three large groups of countries the GDP per capita growth is the one predicted by Maddison (retaining the D-M series for all the other countries), the decline in global inequality is distinctly lower, with decreases of 5% for the Gini coefficient, 13% for the Theil index and 3% for the MLD (this indicator, which is very sensitive to the share of the first quintile, translates the consequences of Maddison's hypotheses for this African group). Moreover, the share of the first quintile falls from 2.3 to 1.8% despite a reduction in global inequality and it is quintiles 3 and 4 that are the big winners. The Maddison's hypothesis seems unlikely given the recent performances of certain African countries and the IMF's forecasts for the coming years. But a tripling in 22 years (D-M hypothesis) also seems unlikely.

24. By comparing the three combinations of hypotheses on growth in GDP per capita:

- Maddison's forecasts;

- The D-M forecasts;

- The D-M forecasts except for the three big groups of countries for which the Maddison series is used;

Neither the first nor the second combination seem likely. The pessimistic theory has already been refuted by the performances of the poor countries, particularly Africa, and by the IMF's revisions for African countries by 2015. Yet the optimistic theory seems weak because for GDP per capita to triple in 22 years would require a truly exceptional performance. The most likely outcome therefore falls somewhere between these two theories, signifying a decline in global inequality from 2008 to 2030, but at a slower rate than between 1992 and 2008. One certainty remains, though, in any event the share of the "emerging class" to use Kharas' expression, i.e. that of quintiles 3 and 4, in global income will rise sharply by 2030, while that of the richest 5% will continue to fall.

The key role of inequality between countries in the evolution of total inequality

25. Table 3 complements table 2 by providing a breakdown of the two indicators which can be disaggregated, Theil and MLD, between internal inequality and inequality between countries. The role of the between countries Theil index sees some considerable variations. In 1700 the role of inequality between countries is negligible at 6.5%. Except for a few West European countries, global inequality mainly corresponds to the same gap in each country between a small minority (5% or at most 10%) and the rest of the population that lives in poverty or misery. Since 1700, the role of inequality between countries continued to increase reaching 61% in 1992. But it has since fallen to 42% in a few short years (or 51% according to Maddison's hypothesis). Of course, we have not taken into account variations in internal inequality, which has increased slightly since 1992 (see document 2). If we do take this effect into account, the decrease in the role of inequality between countries on total inequality would be even greater. We would therefore return to the breakdown observed in around 1900.

TABLE 3 – Breakdown of inequality between internal inequality and inequality between countries

	Theil				Mean logarithmic deviation			
	Internal	Between countries	In % of total	Total	Internal	Between countries	In % of total	Total
1700	0.446	0.035	0.073	0.481	0.360	0.031	0.079	0.391
1820	0.462	0.051	0.099	0.513	0.369	0.045	0.109	0.414
1870	0.484	0.186	0.278	0.670	0.382	0.160	0.295	0.542
1910	0.498	0.299	0.375	0.797	0.399	0.269	0.403	0.668
1960	0.319	0.458	0.589	0.777	0.300	0.466	0.608	0.766
1992	0.343	0.540	0.612	0.883	0.332	0.528	0.614	0.860
2000	0.348	0.508	0.593	0.856	0.333	0.487	0.594	0.820
2008	0.357	0.392	0.523	0.749	0.335	0.396	0.542	0.731
2020 Maddison	0.361	0.378	0.512	0.739	0.336	0.408	0.548	0.744
2020 D-M	0.368	0.290	0.441	0.658	0.335	0.303	0.475	0.638
2030 Maddison	0.367	0.381	0.509	0.748	0.336	0.447	0.571	0.783
2030 D-M	0.377	0.226	0.375	0.603	0.336	0.244	0.421	0.580

26. For three centuries there has been no common measure of variations in inequality between countries and variations in internal inequality. The between countries Theil index varied from 0.03 and 0.54, i.e. 1 to 18, while the internal Theil fluctuated within a limited range 0.35 to 0.50, i.e. from 1 to 1.5, with a minimum in 1960 and a maximum in 1910. With a relatively stable internal inequality and an inequality between countries which varies from 1 to 18, it is inevitable that the second sets the dominant trend for total inequality. The decline in inequality between countries since 1992 has led to a decline in total inequality, just as the rise from 0.03 to 0.54 doubled total inequality in three centuries.

DISCUSSION OF THE RESULTS

27. This discussion has a twofold objective: to verify for the period 1992-2008 whether the estimated evolution tallies with the other estimates and to determine for 2008-2030 the key factors that may contribute to or prevent a reduction in total inequality.

1992-2008

28. Sala-i-Martin (2010) chose a reliable method by combining national accounting sources for GDP per capita with household income surveys for income distribution, and by assuming that the latter would follow a log-normal law. With access to 1063 national surveys in 193 countries, he estimated the internal income distributions, the distribution between countries and the global distribution for 1970-2006. From 1970, internal inequality falls reaching a minimum in around 1985, it then rises, seeing a sharp increase at the end of the 1980s and the start of the 1990s due to the break-up of the USSR and the transition in this country and in Eastern Europe to a market economy. This rise, however, represents just one third of the decline in inequality between countries. From 1992 to 2006 the decreases in global inequality are as follows:

Gini: from .649 to .612 i.e. **-5.5%**
Theil: from .805 to .706 i.e. **-12.3%**
DLM: from .847 to .755 i.e. **-10.8%**

29. In order to compare these variations with those in table 2, we first need to remember that our estimate is based on 33 countries or groups of countries instead of 193 countries, which reduces the inequality (about -.020 for the Gini coefficient). But since this factor is constant, it does not distort the estimated relative fall in inequality as represented in table 2 for 1992-2008 for the same indicators: -6.4%, -15.2% and -15%. Given the increase in internal inequality (which represents only a third of the opposite effect and is not taken into account in our estimate) we have results that are fully compatible for the two indicators that can be broken down.

30. Bhalla (2002) has devoted a work to world inequality and poverty from 1950 to 1999. For the period that covers ours (1992-1999) he estimates the decline in total inequality to be -1.5 points for the Gini coefficient, which agrees with the decline indicated in table 2 (- 1 point for 1992-2000).

31. Hillebrand (2008) estimated global inequality in 1980, 2000 and 2005. He took the GDP per capita data according to Maddison and applied the same method as Bhalla to estimate the distribution within each country. For 1980 he obtains the same Gini coefficient as B-M (2002). This coefficient is constant between 1980 and 2000 when it then drops 2 points (from .651 to .634, i.e. -2.6%)

32. Two studies address only inequality between countries for 1980-1998, one is by Boltho and Toniolo (1999), and the other by Melchior et al. (2000). They both arrive at the same result: a drop in the Gini coefficient of 8 to 9%. This figure tallies with our estimate of -7% for the same period (1992-2008). It is actually slightly higher because no sharp decline occurred in the 1980s like it did between 2000 and 2008.

33. This array of works written by different authors using different methodologies and different databases all confirm the same trend: a significant decline between 1992 and 2008.

2008-2030

34. However, while a continuation of this decline is a plausible possibility, it is not a certainty. For this reason, it is useful to analyse the conditions that would cause global inequality (at constant internal inequality) to continue falling.

The role of Africa

35. Simulations using two databases like those on population growth rate show that Africa plays an essential role. This conclusion agrees with that of Hillebrand (2008) who has made predictions on GDP per capita growth rates up until 2050, by assuming that internal distributions will remain unchanged. He shows that the hypotheses on Africa (GDP per capita growth rate and demographic growth rate) have a decisive impact on the evolution of world inequality and poverty.

36. The same is true with our simulations. With the D-M database, we obtain growth forecasts for African countries that are much higher than with Maddison's database. For example, these rates reach 3.9% in Egypt and 5.6% in Nigeria. Likewise we obtain a rate of 6% for other countries with a relatively large population like the Congo, Mozambique and the Sudan. We also forecast rates of 3 to 4.4% in Angola, Cameroon, Uganda and Tanzania instead of 1 to 2% according to Maddison. However, these African rates anticipated by Maddison were recently contradicted by the performances of several African countries. Combining the growth rates for Africa taken from the D-M database with rates for the other countries from Maddison's database shows that the growth hypotheses for Africa have a significant impact (Table 4, Panel A).

37. There is a second factor that plays a key role in Africa, however, and that is demography. According to the predictions used by Maddison which we have also used, the populations of Nigeria, Côte d'Ivoire and Kenya should increase by 50% between 2008 and 2030, and those of other Sub-Saharan African countries should increase by 73% (with the exception of South Africa whose population is stable), while rich countries will undergo zero growth. China and India will have an average increase of 20% and the world population will rise by 26%. If we suppose that the African population will increase at the same average rate as the world population, then global inequality would decrease, since for 2030 we would obtain the results indicated in Table 4, Panel B.

TABLE 4 – COUNTERFACTUAL SIMULATIONS

Panel A – Growth of African countries

	2008	Maddison	African countries: D-M Other countries: Maddison	D-M
		2030	**2030**	**2030**
Gini	0.622	0.624	0.594	0.565
Theil	0.749	0.748	0.68	0.603
MLD	0.731	0.783	0.639	0.580

Panel B – The role of demography

	2008	2030 Maddison	2030 Average demography
Gini	0.622	0.624	0.609
Theil	0.749	0.748	0.702
MLD	0.731	0.783	0.739

PANEL C – Growth of India and China

	2008	Maddison	India and China: D-M Other countries: Maddison	D-M
		2030	**2030**	**2030**
Gini	0.622	0.624	0.610	0.565
Theil	0.749	0.748	0.705	0.603
MLD	0.731	0.783	0.776	0.580

38. This hypothesis on demographic growth in Africa would be enough to significantly reduce global inequality (-2.5% for the Gini coefficient, -6% for the two other indicators).

39. Africa may contribute to reducing global inequality in two ways: by slowing down its demographic growth (even if the rate remains higher than the global average rate) and by having a higher GDP per capita growth than the one forecast by Maddison, which would tally with the IMF's forecasts for 2011-2015. As the GDP per capita is lower there than in the other regions, this effect on inequality would go hand in hand with a significant reduction in poverty.

The role of emerging countries

40. The other key factor is growth in the two biggest countries in the world. The issue is whether or not to make predictions based on the D-M database, i.e. 5% for GDP per capita in China and 5.6% in India instead of 4% according to Maddison's database. The difference in absolute value is circa one point, yet because these two countries represent 37% of the world population, this difference is enough to have a significant impact on global inequality. This is demonstrated in a simulation for which we use the Maddison series apart from his figures for GDP per capita growth in China and India, which are taken from the D-M database (Table 4, Panel C).

41. In all the cases envisaged, European countries, North America and Japan will not play a big role in this evolution in global inequality despite the fact they are the main countries responsible for and to benefit from the rapid rise in inequality from 1820 to 1960, and even since the start of the 18th century for certain countries. These countries have at times experienced large variations in internal inequality since 1992 (see document 2), but as document 2 shows, these variations have no significant impact on global inequality. Therefore, whether it concerns inequality between countries or internal inequality, the history of global income inequality is no longer written in these countries.

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