

Internal income inequality and global inequality

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Summary

Our simulations in document P25 on the changes in global inequality from 1992 to 2030 are based on the assumption that within countries distributions are perfectly stable. In the previous exercise, we reused the internal distributions for 1992 (B – M 2002) for all years. We know, however, that distributions changed between 1992 and 2008, sometimes with significant variations, and that the changes from 2008 to 2030 may be different, depending on the assumptions made about various factors with an influence on distribution. The aim of this document is to take into account the changes in within inequality in order to estimate real inequality which results from both inequality between countries average income and within countries inequality. For 1992-2008 we have used household surveys to measure income distribution. For 2008-2030 we made hypotheses on possible changes based on the analysis of 1992-2008 income distributions which are revealing of factors of changes.

1. Changes in inequality within countries and global inequality from 1992 to 2008

We deal first with the changes of within countries inequality.

1.1. Changes in inequality within countries 1992-2008

The increase in inequality in certain countries as a result of the very strong growth of high incomes, for example in the United States, or because of a rapidly increasing gap between average incomes in rural areas and average incomes in urban areas, for example in China, has prompted a significant amount of coverage both in the media and in academic journals. In addition, income inequalities have to some extent been held responsible for the most serious financial crisis since 1929, an exceptional set of circumstances. This is the thesis put forward by R. Rajan (2010), former Chief Economist at the IMF. According to Rajan, the stark worsening of inequalities in the United States, to the detriment of low-income households and low earners, posed a real problem to which a poor solution was offered, namely indebtedness. This allowed low-income households to live beyond their means, resulting in imbalances which in turn led to the sub-prime crisis. For Rajan, the only solution would have been to help low earners access to more education and training to help them remain competitive in what has become a globalised employment market, given the significant influx of immigrants into the United States.

Focusing attention on inequality in the two largest economies in the world has established a widespread belief that income inequalities have been increasing in all countries around the world for the last 20 years or so. This belief is corroborated by the facts, as outlined in the OECD (2008) publication "Growing Unequal", whose title alone is a sufficient indication of the changes seen in income distribution. One figure in the OECD 2008 publication (figure 1.2: Trends in income inequality) clearly shows a dominant upward trend in member countries, with an increase in 22 countries and a decrease in just five between 1985 and 2005.

For the purposes of this study, it was important to verify whether the same trend was dominant in non-member countries as well. We also used a slightly different time frame than the one used in the OECD publication to align with our database. This takes its starting point as 1992 (which is the last year for which figures are estimated in AER's 2002 article) and its end point as 2008.

Choosing 1992 as a starting point is obvious since the aim of the present document is to pursue the Bourguignon-Morrisson 2002 article by using the same methodology and the same series on population and GDP/capita than those built up by Maddison. This produces coherent results over the very long period 1820 through 2008 and even from 1700 through 2008 thanks to Maddison's estimates for the eighteenth century. 2008 is the most recent year for which we have actual GDP figures per inhabitant and within countries distributions. Because of global crisis starting late in this year, 2008 is a good reference because it is the last before a crisis which appears to be the most severe that occurred since World War II.

Wherever possible, we have used the same definition of disposable income as that used in the OECD publication (2008) for OECD member countries, i.e. primary household income less direct taxes paid plus transfers received in the form of cash. Sources of information on the distribution of disposable income also exist in Latin America, the non-OECD region where direct taxes and particularly cash transfers have the most significant impact. The OECD unpublished data are useful insofar as they cover most countries up to 2008.¹ For other countries, we used the date closest to 2008. For the start date, we used the average estimate in OECD countries for 1990 to 1995 wherever possible. For other countries, we again used the date closest to the reference year, i.e. 1992. The OECD data are exceptionally useful insofar as they are rigorously coherent (same definition of disposable income and adjustments for economies of scale based on household size with the same degree of elasticity). For other countries, we focused on sources which appeared to remain coherent between 1992 and 2008, but these were not always available. In addition, in some countries, the only surveys available show only the distribution of household consumption expenditure. These sources were used by adjusting expenditure distribution to calculate income distribution by increasing the Gini coefficient by 0.05 point, i.e. the average discrepancy observed in Indonesia over four years, where it is possible to make a comparison between both sets of figures.

The presentation of the results (table 1) was guided by a number of concerns. We did not aim at covering all countries but chose a representative sample for the different categories. Developed countries (members of the G7 plus Australia, the Scandinavian countries and Korea) are shown together, as are developing countries, namely countries whose GDP per inhabitant was still less than \$5,000 in 2008. We also created two other groups. One was for eight emerging countries whose GDP per inhabitant in 2008 was between \$5,000 and \$15,000. These are countries that have experienced rapid or even very rapid growth between 1992 and 2008 (GDP per inhabitant increased by 3 to 4% a year in Chile, Peru, Thailand and Tunisia between 1992 and 2008), bringing them close to the income level of the European Union of 15 Member States (GDP per inhabitant in Portugal and Greece in 2008 was close to \$15,000).

¹ We would like to express our warmest thanks to Mr Foster and Mr Ladaïque, who were kind enough to make available the most recent figures (for 2008) to us although these have not yet been published.

Table 1 – Within inequality of disposable income

Country	Year	Gini	Year	Gini	Variation	GDP/inhab. 1992	GDP/inhab. 2008
Emerging countries							
Brazil	1990	.595	2007	.553	-.042	4 800	6 429
Chile	1990	.535	2007	.518	-.017	7 505	13 185
Colombia	1997	ND	2006	ND	+6%	4 893	6 330
Mexico	1995	.509	2008	.467	-.042	6 333	7 979
Peru	1997	.54	2006	.49	-.05	2 931	5 388
Thailand	1992	.446	2006	.425	-.021	5 295	8 750
Tunisia	1990	.446	2000	.450	+.004	3 597	6 103
Turkey	1995	.480	2008	.400	-.080	5 562	8 066

Transition countries

China	1992	.392	2003/7	.485	+.093	2 132	6 725
Hungary	1995	.290	2005	.287	-.003	5 528	9 500
Poland	2000	.312	2005	.363	+.056	4 842	10 160
Russia	1992	.430	2008	.440	+.010	6 300	9 111
Czech Republic	1995	.213	2005	.267	+.054	7 818	12 868

Developing countries

South Africa	1993	.544	2005	.595	+.051	3 566	4 793
Bangladesh	1992	.312	2005	.355	+.043	655	1 146
Ivory Coast	1993	.420	2008	.454	+.034	1 214	1 095
Egypt	1991	.366	2004	.366	0%	2 408	3 725
Ghana	1991	.420	2005	.472	+.052	1 099	1 650
India	1992	.370	2004	.410	+.040	1 345	2 975
Indonesia	1993	.411	2005	.433	+.022	2 840	4 428
Kenya	1992	.607	2005	.516	-.091	1 049	1 098
Pakistan	1992	.363	2005	.336	-.027	1 715	2 239
Philippines	1991	.500	2006	.466	-.036	2 099	2 926

Developed countries

Germany	1990	.266	2008	.296	+.030	16891	20801
Australia	1995	.309	2008	.336	+.027	17481	25301
Canada	1990-95	.288	2008	.324	+.036	18 139	25 267
Korea	1992	.344	2010	.336	-0.008	9 803	20 041
Denmark	1990-95	.220	2008	.246	+.026	18 949	24 621
United States	1990	.348	2008	.378	+.030	23 298	31 178
France	1990-95	.284	2008	.293	+.009	17 994	22 223
Italy	1995	.348	2008	.337	-.011	16 637	19 909
Japan	1995	.323	2008	.329	+.006	19 482	23 098
Norway	1995	.243	2008	.250	+.007	19 561	28 500
United Kingdom	1990-95	.320	2008	.345	+.025	16 133	23 742
Sweden	1990-95	.220	2008	.259	+.039	16 997	24 409

This level of growth was achieved in the context of increasing openness to the flow of goods, services, capital and labour. It is interesting to see the changes in income distribution in these countries, since an increase in inequality is often attributed to their integration into the world markets.

We have also separated out economies in transition, insofar as they pose a specific problem in relation to inequality. If countries reject a planned economy and choose to operate in global markets, we see a combination of two factors. On the one hand, the move to a market economy within the country and private ownership of the means of production leads to an increase in inequality through the existence of capital and business income and liberalisation of the labour market. On the other hand, the decision to operate in the global market (which is not automatically linked to the previous choice) will have an impact on changes in income distribution. These cases therefore need to be carefully analysed to distinguish the effects of transition from the effects of integration in the world market.

The sample of developed countries (table 1) shows some expected and some more surprising results. Amongst members of the G7, four countries have seen a marked increase in inequality, namely the United States, United Kingdom, Canada and Germany. It is important to emphasise that the first two were ranked highest for inequality in 2008, with higher Gini coefficients than those of other developed countries (whether they appear in the table or not). This explains the reactions to an increase that seems all the more shocking to public opinion in that it has occurred in countries which were already less egalitarian than others with a comparable level of *per capita* income. In three countries (Japan, France and Italy), however, the variations in Gini coefficients are sufficiently insignificant that they can be thought of as stable. It is interesting to note that stability in a country as important as Japan (the world's third-largest economy) attracted no media coverage, with all the attention focused on the United States and United Kingdom. Amongst other countries, there was similarly an increase in inequality in Australia, Denmark and Sweden but relative stability in Korea and Norway. Thus, based on reliable and coherent statistics, we see either a marked increase, of the order of 10%, in the Gini coefficient (even more in Germany) or stability. The first result is more frequent than the second, but we cannot therefore conclude that this period is characterised by an increase in inequality in all countries. The cases where the situation has remained stable are all the more interesting insofar as they are found in economies which operate in the same context as that of countries where an increase in inequality is observed. The best example is that of Germany compared with France and Italy, all of which were original members of both the European Union and the euro zone.

The divergence of their results can be explained in part by different policies. France, for example, chose to increase its minimum wage faster than average salaries were increasing and to pay generous sums of unemployment benefit (whilst Germany reduced support for the unemployed under the Schroder government). France relied on borrowing to fund its benefits system, whilst Germany focused on reducing its budget deficit. France introduced a wealth tax (which has been done away with in Germany), which led, over a 30-year period, to around a quarter of wealthy

families leaving the country: in 2009 there were 60,000 tax households with assets in excess of €2.5 million (based on wealth declarations to the Finance ministry) whilst between around 15,000 and 20,000 tax households have left France since 1982 to avoid the tax. Clearly, the more families with this level of wealth that leave the country, the greater the reduction in inequality. Such policies have helped to avoid the increase in inequality in terms of disposable income seen in Germany. If both countries – which are in the same position in terms of their openness to external markets – had followed the German policy, it seems more than likely that France would be in the same situation as Germany.

Different changes can also be seen in the developing nations, depending on the country. Inequality is increasing significantly in Ivory Coast and South Africa (in spite of the end of apartheid) but decreasing in Kenya. The same applies in Bangladesh, compared with Pakistan. In the Philippines there has been a fall in inequality, whilst it has risen in Indonesia (though according to another source it has fallen). It is clear, nonetheless, that it is the increase in inequality in India that has the most impact, given the size of the country.

The emerging economies are particularly interesting insofar as they illustrate the impact of globalisation on economies which have achieved significant and even rapid growth due to exports over the last 20 years. With the exception of Colombia, inequality has remained stable or decreased in all these countries. It must be said that from the 1990s or 2000s onwards, several Latin American governments embarked on a policy of cash transfers to benefit the poorest sections of society (10 to 20% of the population), which had a significant impact on the distribution of disposable income in societies with a high level of inequality, where poor people had very low incomes and the share of those in the first quintile was much lower than in other countries. Turkey and Thailand, however, have also achieved a decrease in inequality in very different contexts (with lower initial inequality and no radical changes in redistributive policy).

Transitional economies are characterised by a change in the opposite direction, with an increase in inequality except for Hungary (although there was an increase in the Gini coefficient of 0.021 between 1990 and 1995, which caused an increase for 1990-2008). The change in Russia is insignificant, but it is important to refer back to the situation under the Communist regime until the late 1980s. There was a very significant increase in the Gini coefficient, from 0.36 to 0.43. The increases in Poland and the Czech Republic are significant, and even more so in China. The Chinese situation is unusual, insofar as it combines transition and rapid growth with an emerging economy (GDP per inhabitant tripled between 1992 and 2008). It could be thought that being in transition would increase inequality whilst growth would tend to reduce it, as in other emerging economies, but this is not the case. There is another example of an emerging economy with a Chinese population, namely Taiwan between 1960 and 1980 (where GDP per inhabitant increased from \$1,500 in 1960 to \$5,900 in 1980, i.e. the same level as China in 2008), which has avoided an increase in inequality. Its success can be explained by the absence of an increasing gap between average incomes in rural and urban areas, thanks to very rapid growth in agricultural production and exports and the development of small industrial businesses in rural areas.

The example of Taiwan in 1960-1980 and that of other emerging economies (cf. table 1) show that rapid growth driven by exports is compatible with a stable or even decreasing level of inequality. The result is not surprising. According to the Stolper-Samuelson theorem, with market opening countries specialize according to their factors' endowment. Countries with an abundance of highly skilled labour and capital, such as those in Western Europe, tend to have a higher level of inequality, all other things being equal, insofar as they focus on activities with high levels of productivity and pay to the detriment of activities performed by less skilled workers; the latter are gradually reduced or eliminated by imports of manufactured goods and/or agricultural products from emerging countries. The same argument explains the inverse situation in emerging countries (excluding exports of mining products).

This argument can be challenged, however, for a number of reasons. In emerging countries, cutting-edge technologies in high-productivity sectors can be mastered quickly thanks to the rapid progress made in education, despite GDP per inhabitant remaining low. This is the case in India with IT services, and in China (which has a higher GDP per inhabitant) for many high-tech manufactured goods which were not being produced before the 2000s. The result is an increase in inequality, because cutting-edge activities offer high salaries and profits whilst agriculture advances much more slowly than the non-agricultural sector. In developed countries an increase in inequality is not inevitable. The French example shows that social policies can compensate for the impact of openness to immigration and to imported goods. Moreover, the examples of Korea and Japan reveal different kinds of behaviour from those seen in Europe or the United States. The influence of traditional values helps to moderate pay inequalities regardless of the degree of openness. In addition, these societies oppose immigration in order to maintain their cohesiveness and values, which has an impact on the supply of unskilled labour and pay inequality.

The table showing the change in inequalities over the last 20 years or so suggests the need for a prudent approach. A sharp increase in income inequality can be seen in several developed countries as well as in China. Obviously, a lack of equality in the development of the world's two largest economies will capture people's attention. There is significant diversity in other countries too, however, because arguments based on the Stolper-Samuelson theorem are often invalidated by national policies and by the combination of openness and a rapid accumulation of human capital. This diversity has been taken into account in the estimate of changes in internal income inequality from 1992 to 2008 in our database.

1.2. Changes in global inequality from 1992 to 2008.

Having developed a database which takes into account the variations in within inequality from 1992 to 2008, we can estimate global inequality based on the series observed for all variables. Table 2 summarises all the estimates produced since the initial one produced by B-M 2002.

First, we should note that there are:

- Series for GDP per inhabitant and for population (latest year: 1992) published by Maddison in 1995 and used as the baseline for B-M 2002.
- Series for GDP per inhabitant and for population (latest year 2008) presented by Maddison on his website and reused by the Development Centre (OECD). Maddison had revised his initial estimates for several countries.
- Series for internal income distribution up to 1992, created and used by B-M 2002.
- New series for internal income distribution (2011), created and used by us for 1992 and 2008, using the most recent research by the OECD, which goes up to 2008. The OECD has produced estimates for 15 countries or groups of countries in our database out of 30 (33 less three groups of several countries). For the 15 other countries (or groups of countries), we mainly used the two databases of WIDER and the World Bank.

TABLE 2 - Global income inequality 1992-2008

	1992			2008	
	b	a	c	b	a
Gini	.666	.651	.657	.622	.618
Theil	.883	.812	.855	.749	.718
DLM	.860	.822	.827	.731	.729

Table 2 shows three estimates for 1992:

a: the Maddison series for 2008 and internal income distribution series from our own estimates (2011)

b: the Maddison series for 2008 and internal income distribution series from B-M 2002

c: the Maddison series for 1995 and internal income distribution series from B-M 2002

(c corresponds to the article published in 2002; a to table 2 of document P25 and b to table 3 below).

A comparison between estimates b and c shows that Maddison's revision of the series he published in 1995 had a limited impact: the Gini coefficient is almost the same (0.666 instead of 0.657). The discrepancy for the other two indicators, however, is more marked: these are higher in estimate b. The discrepancy can be explained by the fact that Maddison's revisions only relate to non-OECD member countries, many of which have low GDP per inhabitant and whose population figures he revised upwards.

A comparison between a and b, based on the same figures for GDP per inhabitant and population, shows the effect of our revision of the internal income distribution series. There is a decrease in global inequality, in particular for the Theil index and MLD, which can be explained by the figures on OECD member countries. The figures for these countries from 2011 often show a significantly lower level of inequality, with differences of 5 to 10 points for the Gini coefficient (0.30 instead of 0.35 or 0.40). The discrepancies for other countries are low and in some cases non-existent or in the opposite direction. For OECD countries, the differences result from the fact that the 2002 baseline underestimated the impact of direct taxation and cash transfers to households.

The estimates shown in b for 2008 are based on the same series as for 1992, namely Maddison's 2008 series, and on the internal income distribution figures in 1992 used by B-M 2002. The decrease in the Gini coefficient (from 0.666 to 0.622) (cf. table 2 of document 1) results from the reduction of inequalities in average income between countries

The most interesting estimates are those shown in a, because they measure the joint effects of variations in GDP per inhabitant and population and variations in within inequality, using new, coherent series for within inequality. A decrease in the Gini coefficient (from 0.651 to 0.618) i.e. -0.033, instead of -0.044 in b can be observed. The decreases for the other two indicators are 11%. Comparing the decreases in the Gini coefficient in a and b shows that the increase in within countries inequality between 1992 and 2008 compensated for approximately a quarter of the decrease in inequality between countries. A comparison between the Theil and MLD baselines for estimates a and b produces the same results: -11.5% instead of -15%. Within countries inequality has thus increased, but given that the effect is much less than that of the decrease in inequalities in average income between countries, there has been a net decrease in global inequality.

Global inequality with regard to incomes, which increased steadily from the beginning of the 18th century onwards, has fallen significantly for the first time since 1992. This is purely the result of the reduction in the gap in GDP per inhabitant between countries, since within countries inequality has increased slightly. This is a historical turnaround. Within countries inequality, which had decreased significantly since the beginning of the 20th century, increased sharply (20% for the Theil index) between 1992 and 2008 (after a slight increase of 7% between 1960 and 1992). In terms of its contribution to total inequality, the turnaround dates from 1992-2008: the share of within inequality in total inequality decreased until 1992 (33% in 1992, table 4) before increasing again to 45% in 2008. Thus from 1700 to 1992, inequality between countries increased from 7% to 67% of total inequality whilst within inequality, which was almost the only inequality factor in the world in 1700, played a significant role again in 2008.

An analysis of inequality per quintile reveals the first increase since 1700 in relation to the poorest 40%, from 6.3% to 7.1%, after three centuries of decline, from 14% to 6.3%. Similarly, we can see the first decrease in the share of the tenth decile since 1700, from 51.5% to 48%. This affects the share of the last quintile in the same proportion, from 33.2% to 30.9%. The same applies to the 9th decile, whose share decreased after rising for three centuries, from 19.8% to 19.1%. The main

beneficiaries of the turnaround are individuals in the 3rd and 4th quintiles, who posted a gain of three points, up from 24.1% in 1992. The 4th quintile could be seen as a global middle class, with average incomes close to the global average. The gain also affects individuals in the 3rd quintile, who are close to the median global income, and even more so in relative terms.

These results are in line with those of Sala-i-Martin (2010) for 1992 to 2006, since he calculated decreases of 5.5% for the Gini coefficient instead of 5% based on our estimate. It is striking that such similar results are obtained with different statistical bases and different methods (Gini: from .649 to .612 instead of .651 to .618 and Theil: from .805 to .706 instead of .812 to .718).

These results are also confirmed by Bourguignon's 2011 estimate in the new database that he has built for the period 1989-2006. He chose the GDP series referring to ICP 2005 (International Comparison Program) of the World Bank instead of the \$1990 of Maddison, applying to a set of 160 countries. For within countries distributions, he used OCDE estimates for member countries and for developing countries those of World Bank POVCAL. Thus he obtains a decrease of circa 6.4% of the Gini coefficient for this 17 years long period (see the curve in figure 1 of his chapter). But this coefficient cannot be compared to the one we obtained for 1992, which is nearly the same as that in the AER 2002 article, because referring to the \$2005 value entails a greater gap in GDP/capita between developed and developing countries. However, the fact that three estimates based on different databases give very similar results prove that this decrease in world inequality, the first observed since 1700 is indisputable.

2. Changes in inequality within countries and global inequality from 2008 to 2030

It is very difficult to produce forecasts of within inequality in 2030. The OECD study (2011) ("The Causes of Growing Inequalities in OECD Countries") is very useful for making plausible forecasts for several countries. The study actually covers not only developed countries, but also three European countries in transition (Hungary, Poland and the Czech Republic) and two emerging countries: Mexico and Turkey.

We outline below our hypotheses for each group of countries in turn.

Developing countries

As there is no clear trend for the period 1992-2008, we have assumed that within distribution for each country in 2030 is the same as in 2008. In fact, it is very likely that inequality will increase in certain countries, but if the opposite situation arises in other countries (it is possible to envisage a net reduction in inequality in countries such as Algeria and Morocco because of increasing democratisation, which would result in a more redistributive tax system and more widespread access to secondary and higher education for poor families), one will cancel out the other and the impact on global inequality will be neutral. The only exception we have made is for India, because of the country's significant influence on global distribution. India's Gini coefficient increased from .37 to .41 between 1992 and 2008, whilst the country introduced significant reforms in terms of

deregulating its domestic markets (which increases within inequality) and engaging more in world technological competition (a second factor in increasing within inequality). We can assume these policies will continue to be pursued and will increase earnings inequalities (salaries plus income from self-employment). We have selected two hypotheses: the same Gini in 2030 as in 2008, or an increase of 4 points (.45 in 2030), the same variation as between 1992 and 2008.

Transition countries

Transition results in a net increase in inequality for several reasons: the emergence of capital income, the distribution of which is very uneven, an increase in income from self-employment, the distribution of which is more uneven than that of salaries, and more flexible redundancy rules. It is very likely, however, that all these factors have already played their part. In Hungary, for example, the part played by capital income in income inequality (amongst people of working age) increased from 0% in 1985 to 8% in 2005 (cf. OECD 2011 table 7.3), i.e. a higher percentage than the average of the OECD countries examined. We have therefore reused the distribution figures observed in 2008 for 2030. We have made an exception for China, which has been both a transition country since the 1980s (whilst transition in other countries began in the early 1990s) and an emerging country if we consider the level of GDP per inhabitant it has achieved (\$6,700 in 2008) and the decisive role in growth played by openness to the outside world since the 1990s. In other emerging countries with a similar level of GDP per inhabitant, inequality has fallen sharply compared with a significant increase in China. The change can be explained partly by transition in China and partly by the growth model, which has entailed a considerable and growing discrepancy between average incomes in rural and urban areas. We have therefore selected two hypotheses: Gini from 2008 to 2030 constant or an increase equal to half that between 1992 and 2030, i.e. +0.046. We should note, however, that based on this pessimistic hypothesis China would reach a very high level of inequality, higher than that in transition countries and in the emerging countries shown in table 1 (except for Brazil). The current high level of inequality has prompted social reactions which the government will find difficult to ignore. Significant measures to support rural areas, such as a more redistributive policy, are likely and would help to avoid an increase of 0.046 in the Gini coefficient.

Emerging countries

There are three countries in our database, each of which is considered separately: Brazil, Mexico and Turkey. As the second and third are members of the OECD, we have OECD data which indicate a net decline in the Gini coefficient between 1992 and 2008. The same applies to Brazil. Other emerging countries are included in the database, but combined with one or two other countries which are not listed in the same category. This applies to Tunisia with Algeria and Morocco, Chile with Argentina, Thailand with the Philippines, and Colombia and Peru combined with an oil-producing economy, namely Venezuela. Where countries are grouped together in this way, we have reused the 2008 distributions, given the lack of certainty over changes in inequalities both within the countries concerned and between them. Conversely, for the first three countries cited,

we can either assume that distribution remains constant, or that the trend identified continues but at a slower pace as the countries concerned become more like developed countries, none of which show a trend towards a decline in within inequality between 1992 and 2008. We have opted for the first solution, but we could also have assumed a decrease in the Gini coefficient equal to half that observed between 1992 and 2008.

In any case, we have rejected the hypothesis of an increase in inequality. For the two OECD member countries, Mexico and Turkey, we have statistics on the changes in direct taxation (direct taxes paid by households) and on social expenditure (OECD 2011, table 8.3, figure 8.5). The percentage of taxes in 2005 was two to three times lower than the average percentage in OECD countries, but has increased rapidly since 1985. Social expenditure represented only 5 to 10% of GDP in 2005 compared with 20 to 30% in most OECD countries. The percentage in 1985, however, was even lower (2%).

We can therefore assume that these upward trends will continue, bringing both countries closer to other OECD countries, which in turn will increase the redistributive effect of household taxation combined with social expenditure. In addition, both countries are lagging behind other OECD countries in terms of the number of years of education and an increase in school enrolment after the age of 14 is likely. The education variable, in fact, has a high negative coefficient in regressions on salary inequalities. We can also assume, however, that the technical progress variable will have the opposite effect in these countries because of their openness, but the combination of the three factors is unlikely to drive inequality.

Developed countries

The OECD study (2011) provides some very useful analyses for forecasting the changes in within inequality from 2008 to 2030. It identifies the full range of factors which have either increased or decreased inequality. If we only consider households with people of working age and their incomes (salaries and income from self-employment), we can see that two non-egalitarian factors (the increase in the number of single-parent families and the increasing correlation in the salaries of the two partners in a couple) are largely compensated for by the increase in women's employment, which has the opposite effect. In addition, an analysis of the redistributive effect of the taxes paid by households and the cash transfers they receive shows that their impact remained stable from 1992 to 2008. This analysis does not take account of transfers in kind in the form of education, healthcare and assistance services, but the 2011 OECD study notes that the redistributive impact of these services has remained unchanged over 20 years or so.

The key factors which explain the increase in inequality in numerous countries are therefore:

- 1) To a limited extent, the increase in the share of capital income, which is more concentrated than other forms of income.

2) More broadly, increasing disparities in terms of salaries and employment levels between different people, depending on their place on the salary scale (the more qualified the employee, the longer they work each year), with these playing a key role.

If we take into account openness to the outside world, technical progress, reforms in the labour and goods markets, education, disparities in salaries increase in line with technical progress and institutional reform and decrease with educational progress.²

Based on the coefficients for reforms and technical progress (table 3.1 and figure 3.3, OECD 2011), we can conclude that the incidence of progress and reforms are broadly similar. The fact that their contributions are comparable makes it possible to forecast a plausible change. We can assume that global competition in relation to technology is likely to continue at the same pace. The situation for other reforms, however, is different. Many OECD countries have been through a process of liberalisation of the labour market and markets for goods since the 1980s. Once liberalisation is complete, only marginal measures can still be taken. We can therefore assume that the impact of this variable will be limited and possibly even negligible in the 2010s and 2020s.

Moreover, some countries have avoided an increase in inequality through rapid growth in education and higher taxes on high incomes (this form of direct taxation is taken into account in table 3.1 and the coefficient is significant). Assuming they have achieved this, there is no reason to suppose that they will not continue to pursue the same policies and we can assume that inequality will remain stable in these countries until 2030.

For those where it has increased, it is likely that only the technical progress factor will play a role and we can therefore assume that the increase between 2008 and 2030 will be equal to half that observed between 1992 and 2008. It is even possible that the actual increase will be lower, because countries may invest more in education than they have in the past. To use Tinbergen's phrase, there is a "race between globalisation/technology and education", as illustrated by the high negative coefficient for the education variable in the econometric analysis of wage differential in table 3.1 (OECD 2011 p. 52).

² cf. table 3.1 page 52 OECD (2011). The external openness variable is no longer significant if we add in the institutional reforms variable, however several economists believe that openness obliges firms to invest as much as possible in technology in order to retain an advantage in relation to foreign competitors.

Summary

These forecasts can be summarised as follows:

1) Developing countries: distributions for 2008 reused for 2030 except for one country, India, for which two hypotheses have been produced: the same distribution in 2030 as 2008 or an increase in inequality equal to that observed from 1992 to 2008.

2) Transition countries: distributions for 2008 reused for 2030, except for China (two hypotheses: the same or 50% of the increase observed from 1992 to 2008).

3) Emerging countries: for the groups of countries, 2008 is reused for 2030. For the three emerging countries (Brazil, Mexico and Turkey), two possible hypotheses have been produced: either stability (used) or a decline in the Gini of 50% of the decrease observed between 1992 and 2030.

4) Developed countries: for countries where distribution was stable from 1992 to 2008, we have reused the 2008 distribution for 2030. For countries where inequality increases from 1992 to 2030, we have assumed an increase of 50% of the increase observed from 1992 to 2030.

Having selected these changes for within distribution, we can estimate their impact based on the estimates in table 3. This shows three estimates for 2030. The first has been produced based on the Duval-de la Maisonneuve (DM) series for GDP per inhabitant and population and our hypotheses for the change in inequality between 2008 and 2030, assuming a net increase in the Gini coefficient for India and China. The second uses the same series, except for India and China, where we have assumed that distribution remains unchanged from 2008 to 2030. The third uses Maddison's forecasts for GDP per inhabitant and population, and assumes a net increase in inequality for India and China. Estimates for 2020 have simply been interpolated based on the estimates for 2008 and the first estimate for 2030.

We will look first at the second estimate for 2030. This can be used to isolate the impact of the increase in within inequality in several developed countries from 2008 to 2030, with the distributions for other countries being the same in 2030 as they were in 2008. Compared with the estimate for 2030, which is based on the distribution for each country remaining the same for 2030 as it was in 2008, there is an increase in global inequality but it is very small: the Gini coefficient and the Theil increase from 0.561 to 0.562 and from 0.582 to 0.586 respectively.

Table 3 - World income distribution 1700-2030

	1700	1820	1870	1910	1960	1992	2000	2008	2020 DM GDP	2030 DM GDP	2030 CHN-IND 2008 inequality DM GDP	2020 Maddison GDP	2030 Maddison GDP
Income shares													
Lower 20%	5	4.8	4	3	2.4	2,1	2,2	2,2	2,5	2,8	2,9	2,0	1,7
Lower 40%	14	13.7	11	8.8	6.8	6,3	6,9	7,1	8,1	8,7	9,2	6,8	6,3
Lower 60%	27.5	26.2	21.7	17.7	14.1	13,6	14,6	15,9	17,7	18,8	19,8	15,7	15,0
Lower 80%	46	44	38	33	31.9	28,7	29,9	32,6	36,4	38,2	39,0	33,3	32,9
Decile 9	13.5	14	14.4	16.1	18.1	19,8	19,6	19,2	17,7	17,0	17,3	18,0	17,6
Decile 10	40.5	42	47.6	50.9	50	51,5	50,7	48,2	45,9	44,8	43,7	48,7	49,5
Top 5%	31	31.8	33.4	36.6	34.1	33,2	32,7	30,9	29,6	30,1	28,7	32	30,8
Inequality indices													
Gini	0,476	0,492	0,559	0,610	0,635	0,651	0,639	0,618	0,591	0,575	0,562	0,621	0,632
Theil	0,481	0,513	0,670	0,797	0,776	0,812	0,783	0,718	0,651	0,615	0,586	0,727	0,757
MLD	0,391	0,415	0,544	0,668	0,766	0,822	0,782	0,729	0,650	0,606	0,578	0,756	0,809
Poverty rates													
Poverty	95,1	94,4	89,6	82,4	64,3	51,5	42,9	32,3	19,9	11,9	10,9	26,8	24,9
Extreme poverty	86,7	83,9	75,4	65,6	44,0	23,5	16,1	11,3	4,3	1,6	1,4	10,2	10,4
Relative poverty	16,6	17,1	18,7	21,1	24,6	26,3	26,4	28,6	27,1	27,4	26,2	28,8	29,8
Headcounts (billions)													
Poverty	0,56	1,00	1,14	1,41	1,94	2,81	2,61	2,16	1,50	1,01	0,92	2,02	2,10
Extreme poverty	0,51	0,89	0,96	1,13	1,33	1,28	0,98	0,76	0,32	0,14	0,12	0,77	0,88
Population (billions)													
	0,59	1,06	1,27	1,72	3,02	5,46	6,08	6,70	7,53	8,45	8,45	7,53	8,45

note: the relative poverty threshold is half of the world median income.

	1700	1820	1870	1910	1960	1992	2000	2008	2030 DM GDP	2030 Maddison GDP
Income Percentile 40	362	388	414	557	856	1518	1973	2688	6080	3377
Income Percentile 60	531	570	648	934	1700	2961	3637	5079	11070	6405
Income Percentile 80	921	986	1233	2285	4299	8458	9043	13838	22674	15059
Income Top 10	1648	1973	3286	4351	8679	17385	19919	26040	49548	30094
Income Top 5	3728	3793	3689	6781	14319	24844	28574	38034	60685	45130

The effect is more marked for quantile shares. The share of the poorest 80% is 39 instead of 39.7. A low incidence of this kind does not mean that the increase in within inequality in several countries from 2008 to 2030 will be of no importance for these countries. This kind of phenomenon may prompt serious social and political reactions, but the increase in inequality has no significant impact on global inequality.

This is not the case for India and China, as is shown by a comparison of the first and second estimates. In fact, the increase in inequality in the two countries raises the Gini coefficient and Theil index from 0.562 to 0.575 and from 0.586 to 0.615 respectively. The share of the poorest 60%, which includes many Chinese and Indians living in rural areas, is reduced from 19.8 to 18.8 (i.e. one point in about 20 points or 5%). In any case, a net increase in inequality, notably in countries such as China or the United States, where inequality in 2008 was already high, is a highly significant phenomenon in domestic terms but only has a major impact in China and India on global income distribution for two reasons: demographic size and the presence of Chinese and even more Indian people in the poorest 60% with regard to global distribution.

The third estimate, based on Maddison's data, is very different from the first estimate, which is based on the same internal distributions. Global inequality is calculated as much higher, with a Gini coefficient of 0.632 instead of 0.575 (and a Theil index of 0.757 instead of 0.615) and a share for the 10th decile of 49.5% instead of 44.8%. These results are in line with the results in document 1, based on a hypothesis of identical within income distribution between 1992 and 2030. The decision whether to use the Maddison or D-M series is critical, given that with the Maddison series global inequality would be the same in 2030 as in 2008, or even slightly higher, whilst the D-M series, whatever the hypotheses used for internal distribution in China and India, result in a significant decrease in global inequality between 2008 and 2030. The changes in within distribution in the developed countries, China and India have a mitigating effect on world inequality, but the major trends are determined by the change in the differential in average countries incomes.

Hillebrand (2008) has produced forecasts for 2006-2050. Using a pessimistic scenario, he assumes even lower growth rates for GDP per capita for sub-Saharan Africa than those used by Maddison for 2008-2030. The result is an increase in global inequality, with an increase in the Gini coefficient from 0.634 (2005) to 0.708 (2050), compared with stability between 2008 and 2030 according to Maddison's forecasts. It is clear that the more pessimistic the forecasts produced for growth in sub-Saharan Africa and Southern Asia, the two poorest regions in the world, the more global inequality will increase, all other things being equal, given that the change in global inequality depends primarily on the differential in average income between countries.

If we use the D-M series, global inequality decreases at the same rate from 2008 to 2030 as from 1992 to 2008. The result is impressive: a Gini coefficient which decreases by 12% and a Theil index which falls by 24% in around 40 years. The share of the 10th decile decreases from 51.5 to 44.8, and the 9th decile from 19.8 to 17. As a result, the share of the poorest 80% increases by 10 points, from 28.7 to 38.2. The last time we saw a figure at this level was in 1870 (38%). For the same share for the 10th decile we have to go back to 1850. If we look at the Gini coefficient and Theil index, we find approximately the same values in 1870. As this date roughly coincides with the beginning of this first period of globalisation, which lasts until the beginning of the First World War, we would have wiped out the increase in global inequality between 1870 and 1992 in 40 years. If the D-M forecasts were to be confirmed, there would in some sense have been a revolution in global income distribution comparable to the one which occurred between 1870 and 1992, but in the opposite direction.

Changes of this kind result in a new split of global inequality between within inequality and inequality between countries, as shown in table 4.

Table 4 - Breakdown of inequality between within inequality and inequality between countries

	Theil				Mean Logarithmic Deviation			
	Internal inequality	% of total	inequality between countries	Total	Internal inequality	% of total	inequality between countries	Total
1992	0,272	33,5	0,540	0,812	0,294	35,8	0,528	0,822
2008	0,326	45,4	0,392	0,718	0,333	45,7	0,396	0,729
2020	0,361	55,5	0,290	0,651	0,347	53,4	0,303	0,650
2030	0,389	63,3	0,226	0,615	0,362	59,7	0,244	0,606

The share of within inequality in global inequality, which has decreased steadily since 1700, from 93% to 33% in 1992, will increase for the first time, reaching 63% by 2030. This is the result of a combination of two phenomena: a decrease in the between countries Theil index, from 0.540 in 1992 to 0.226 in 2030, and an increase in the within countries Theil index, from 0.272 to 0.389. To put it in more colourful terms, an individual in 2030 will be ranked in terms of global distribution less on the basis of their passport than on where they stand within their country's internal distribution, as in the 18th and 19th centuries. In developed countries, where within inequality is already high and is continuing to increase (the best example is the United States), internal income distribution is again becoming a major topic of debate and could result in further conflict. The citizens of countries ranked in the bottom deciles are reacting to the fact that individuals ranked in the top vintile have an average income which is 20 or 25 times higher, even after taxes and transfers. It is this discrepancy that matters to them, not the gap between the bottom deciles and the top vintile in global income distribution, which is decreasing.

An increase in the internal Theil index (as a percentage of the total Theil index) is certain even if within inequality in China and India remains stable from 2008 to 2030. Conversely, it will be mitigated if Maddison's forecasts are confirmed. In this case the percentage of within inequality in total inequality would be barely half instead of 63%, with a significantly higher between countries Theil index (0.382 instead of 0.226).

As we suggested in document 1, the probability of Maddison's forecasts being confirmed in the first decade seems fairly low given what we currently know, i.e. based on performance for 2009 and 2010 and IMF forecasts for 2011 and 2012, and even 2015. The most likely scenario therefore seems to be a decrease in global inequality but at a slower pace than between 1992 and 2008 (because of less rapid growth in Africa than was forecast by D-M), it being understood, as shown by tables 3 and 4, that the increase in inequality within several developed countries, which attracts the attention of both public opinion and economists, may present a slight obstacle to the trend towards a decline in global inequality, but not challenge it overall.

3. Developments in global poverty

Table 3 also shows percentages and numbers for the poor and very poor since 1700. We have used the poverty and very high poverty thresholds used by Bourguignon and Morrisson (2002). These were chosen to correspond to World Bank estimated values for 1992. Reported values for 1820 to 1960 are therefore those in Bourguignon and Morrisson (2002). The figures for 1992 are virtually the same, with a negligible difference owing to the revision of certain numbers by Maddison.

Percentages for 1700 are slightly higher than those of 1820. The decline from 1700 to 1820 is very slight due to a negligible growth in per capita income in the majority of countries. By contrast, figures fell sharply after 1820, from 94% to 51% in 1992 in the 'poor' category, for example. However, the most striking revelation is the acceleration of this decline since 1992, marking a drop of almost 20 percentage points within a relatively short space of time (falling to 32% over 16 years), compared to a reduction of around 40 percentage points over a 170-year period. With regard to the very poor, who are most threatened by famine, the decline is even more spectacular, with percentages decreasing by more than half, from 23% to 11%. While global income inequality fell between 1992 and 2008, this was nonetheless disproportionate to the reduction in poverty. Never before had poverty decreased as it did after 1992. Although increases in the shares of lower deciles certainly played their part, the overriding factor was the growth in global income per capita, given that these thresholds are set in absolute terms.

The counts of poor and very poor people offer a yet more striking view of the victory over poverty. In sixteen years, the number of very poor people fell from 1,280 million to 760 million, marking a total of 520 million people brought out of destitution. The number of very poor people rose between 1700 and 1960, while their percentage in terms of the global population fell, then stagnated until 1992. This marked the first decline in the figures, which was both sharp and substantial, with almost half of the very poor entering the poor bracket. In the same period, 650 million poor people rose out of poverty. Over time, the numbers have been far greater, since almost all very poor people have entered the 'poor' category. Of the poor in 1992, more than one billion were no longer poor in 2008.

According to forecasts for growth in emerging and developing economies by 2030, the hope is that this decline will continue or cease. Under the best-case predictions of the OECD series, extreme poverty is expected to be almost eradicated by 2030, at 1.6%. The percentage of poor people is expected to fall to one third of the figure for 2008, with total numbers dropping from two billion to one billion. However, even under Maddison's worst-case forecasts, percentages would continue to fall slightly; in particular, the total numbers of the poor and very poor would be the same in 2030 as in 2008. This being the case, poverty would at the very least remain stable, in spite of an increase in the global population of almost two billion, predominantly in the world's poorest countries. As previously noted, the most likely scenario is that the actual performance of global economies will fall somewhere between these worst-case and best-case scenarios. This would lead

to a fall in the total numbers of poor and very poor people, but at a slower rate than between 1992 and 2008.

The analysis that follows of country rankings in the global distribution of income shows that poverty reduction has been achieved at varying rates in different countries. The case of China is unique: from 1960 to 2008 the proportion of China's population classified in the lowest four deciles of the global population fell sharply, while in other Asian countries this share fell, but only slightly. Lastly, in sub-Saharan African countries this proportion did not fall but, as per-capita GDP increased, so automatically the proportion of these populations classified as below the poverty lines slowly declined.

4. Global income distribution: country rankings

Table 5 presents rankings for around a dozen countries (or groups of countries) from our database. The countries in question alone account for two thirds of the world's population. The global income distribution taken as a reference divides the population into five groups: the poorest 40%, or lowest group; the 20% belonging to the median group (percentiles 40 to 60); the group belonging to percentiles 60 to 80; and the deciles 9 and 10, the latter including the 10% richest. The third group represents the 'middle class' worldwide. For example, in 1992, with an average global income per capita approaching USD 5,000, the upper and lower limits were USD 2,960 and USD 8,457. This category therefore includes individuals with USD 2,000 or USD 3,000 either side of the global average.

Deciles were used for each country (or group of countries), with the assumption of zero income dispersion within each decile. This makes it possible to tie the population of each country decile to a per capita GDP bracket defined with reference to global income distribution. With a world population of 6.7 billion in 2008, there are 670 million individuals in each global decile. The movement of a country's given decile from one global decile to the next therefore marks a significant leap up the world rankings.

Contrary to what might be assumed, improvement in global ranking is not a feature in all emerging markets due to their dynamism. Table 5 reveals that the only countries having improved their ranking are East Asian countries. The most spectacular progress has been in China, Korea and Taiwan, and for the period 1960-1992 in Japan. In Japan, for example, the percentage of the population classified as among the world's richest rose from 10% to 50% in those 32 years. China has performed consistently well since 1960. The proportion of the population belonging to the lowest group fell from 70% to 30%, while the percentage in the global 'middle class' rose from 10% to 30%. It should be noted that these results merely replicate – albeit on a different scale – those of Korea and Taiwan, which saw the percentage of their population in the global 'middle class' rise from 20% to 80% between 1960 and 1992.

The performances of other East Asian countries have been less prominent, yet remain significant. In Indonesia, the proportion of the population in the global 'middle class' rose from 10% to 20% or 30%. In Thailand and the Philippines, the same share rose from 10% to 30% or 40%.

The successes of East Asia are reminiscent of those of Western European countries and European populations as they expanded into North America and Australia. Throughout the nineteenth century and the first half of the twentieth century, an increasing proportion of the population of these countries was classified in the global 'middle class', and still more in the global 'upper class'. Later, as we will come to see, the situation stabilised but, since 1992, the trend has reversed.

The United States, Germany and France witnessed an improvement from 1960 to 1992. In the US, the first decile moved from the median group to the 'middle class'. The same was the case for France. In Germany, the share of the population among the world's 20% most wealthy rose from 60% to 90%.

However, from 1992 onwards, these countries experienced their first decline. In Germany, the proportion of the population in the world's 20% richest fell to 70%. The trend was the same in France. In the United States, this proportion fell from 90% to 80%. This phenomenon was linked to the increase in the number of individuals from East Asia in the 10% or 20% richest in the world. A proportion of the 'Westerners' classed in the 10% or 20% richest were replaced by these individuals from Asia.

Sub-Saharan African countries witnessed a change that ran counter to that of East Asia. Here, the proportion of the population classed in the lower group rose from 60% to 90% in the 46 African countries and from 80% to 90% in Nigeria, in spite of the oil. In this way, Asian individuals climbing the global ladder were replaced by Africans.

Russia also saw a sharp decline as the share of its population in the global 'middle class' fell from 80% to 40%. However, this had no correlation with the decline in African countries, and was instead linked to the combined effect of a decline in per capita GDP and a sharp increase in internal inequality linked to transition.

Lastly, figures for South Asian countries, Brazil and Mexico remained almost stable between 1960 and 2008. This was less predictable in Brazil and Mexico, which rank among the emerging economies. However, their growth rates, which were much lower during this period than those of East Asian countries, have had a higher impact than the decline in income inequality since 1992.

In conclusion, trends such as the increase in the share of East Asian countries such as Japan, Korea and Taiwan in the world's richest decile, and the increase in the share of African countries in the 40% lowest, which were identified for 1950-1992 by Bourguignon and Morrisson (2002) are confirmed and reinforced for the last decile and for the global 'middle class', since the overall demographic weight of the new Asian countries in question far exceeds largely that of the three aforementioned countries.

TABLE 5 : The ranking of countries					
Percentiles of the global distribution	1 à 40	40 à 60	60 à 80	80 à 90	90 à 100
CHINA					
1960	D1-D7	D8 D9	D10		
1992	D1-D5	D6-D8	D9 D10		
2008	D1-D3	D4-D6	D7-D9		D10
KOREA-TAIWAN					
1960	D1-D3	D4-D8	D9-D10		
1992		D1	D2-D5	D6-D9	D10
2008		D1	D2-D3	D4-D8	D9 D10
JAPAN					
1960		D1	D2-D7	D8 D9	D10
1992			D1	D2-D5	D6-D10
2008			D1-D3	D4-D7	D8-D10
INDONESIE					
1960	D1-D5	D6-D9		D10	
1992	D1-D3	D4-D7	D8 D9	D10	
2008	D1-D4	D5-D8	D9	D10	
THAILAND-PHILIPPINES					
1960	D1-D5	D6-D9	D10		
1992	D1-D4	D5 D6	D7-D10		
2008	D1-D4	D5-D7	D8-D10		
INDIA					
1960	D1-D8	D9	D10		
1992	D1-D7	D8-D10			
2008	D1-D7	D8-D10			
PAKISTAN BANGLADESH					
1960	D1-D9		D10		
1992	D1-D9		D10		
2008	D1-D8	D9	D10		
46 AFRICAN COUNTRIES					
1960	D1-D6	D7-D9	D10		
1992	D1-D9	D10			
2008	D1-D9	D10			
NIGERIA					
1960	D1-D8	D9	D10		
1992	D1-D8	D9	D10		
2008	D1-D9		D10		
BRAZIL					
1960	D1-D4	D5 D6	D7-D9		D10
1992	D1-D4	D5 D6	D7-D9		D10
2008	D1-D4	D5-D7	D8 D9		D10
MEXICO					
1960	D1-D3	D4 D5	D6-D9		D10
1992	D1	D2 D3	D4-D8	D9	D10
2008	D1 D2	D3-D5	D6-D9		D10
GERMANY					
1960			D1-D4	D5-D7	D8-D10
1992			D1	D2-D6	D7-D10
2008			D1-D3	D4-D8	D9-D10
FRANCE					
1960		D1	D2 D3	D4-D7	D8-D10
1992			D1	D2-D6	D7-D10
2008			D1-D3	D4-D6	D7-D10
RUSSIA					
1960		D1	D2-D7	D8 D9	D10
1992	D1	D2-D4	D5-D9	D10	
2008	D1 D2	D3-D5	D6-D9		D10
UNITED-STATES					
1960		D1	D2	D3-D5	D6-D10
1992			D1	D2-D4	D5-D10
2008			D1 D2	D3-D5	D6-D10

Conclusion: radical and rapid changes.

Prior to 1992, global income distribution had never witnessed such extensive and fast-paced changes. The most significant are listed below.

- For the first time since early eighteenth century, global income inequality fell significantly and indisputably.
- This fall was due to the first drop in inequality in the average income between countries since the eighteenth century.
- Increases in inequality within many countries merely mitigated the impact of the previous fall, but entailed social and political consequences for these countries that cannot be overlooked.
- For the first time since the start of the eighteenth century, the number of poor people and very poor people fell significantly. By the year 2008, over 500 million very poor in 1992 were no longer classed very poor, and over one billion poor in 1992 were no longer poor in 2008 (a proportion being replaced in this group by the very poor in 1992 who had risen to the poor category in 2008).
- The share of individuals from East Asian countries in the global 'middle class' and in the category of the world's 10% richest is increasing rapidly. In the bottom 40% of the global rankings, the share of these countries is falling as fast as that of African countries is increasing.

APPENDIX: internal income distribution data.

Data for non-OECD countries have been compiled by L. Wagner, with our thanks.

OECD member countries.

The major advantage of the OECD data used for 26 countries is the fact that the same methodology has been applied over a period of approximately 20 years (30 years for the majority of countries, but not all). We therefore have a set of data, which is consistent over time and consistent between countries.

Income refers to disposable income adjusted for household size. Adjusted income for each member is equal to household income divided by the number of people to the power $\hat{\epsilon}$. The value selected for $\hat{\epsilon}$ is $\frac{1}{2}$, so for a four-person household, the number of people is divided by two. Income is equal to the sum of primary income plus social security transfers provided by the state minus direct taxes and social security contributions paid by households. Individuals are ranked according to disposable income per adult equivalent.

For the majority of countries, including the main ones, we have estimates for 2008. For the remainder, we have used estimates from 2005. No estimates are available for the start date of 1992, but are available for 1990 and 1995. Depending on the case, we have taken the average of the two estimates or used one where the figures were very close for both years.

An estimate for both dates has been used in each of the following countries: Germany, United States, France, Italy, Japan, Mexico, Poland and Turkey. In other cases, we have used estimates from several countries, such as Ireland + United Kingdom; Spain + Portugal; Austria + Hungary + Czech Republic; Australia + Canada + New Zealand; Denmark + Norway + Sweden + Finland; and Belgium + Netherlands + Switzerland.

In the case of the Greece + Bulgaria + Romania + Yugoslavia group, however, we decided not include Yugoslavia because of the wars and territorial divisions in the country between 1992 and 2008. In addition, as there are no OECD estimates for Bulgaria and Romania, we have assumed that income distribution in both countries followed the same pattern as in Poland based on the same figures.

We used the same method for each distribution estimate in at least two countries, by calculating a distribution based on 10, 15 or 20 groups using the quintiles for each country and estimating the variations in inequality based on this distribution. Finally, we calculated two distributions for 1992 and 2008 by decile and vintile.

AFRICA

South Africa

The source POVCAL NET shows the distribution of household expenditure by decile in 1993 and 2005. This was characterised by a significant increase in the Gini coefficient, from 0.585 to 0.656. In principle the Gini coefficient is increased by .05 points to find the income coefficient. Bosch et al. (2010), however, draw attention to the country's particular situation: the state sector funds transfers to elderly and disabled people and provides free housing and basic services to the poor to a significant extent: the Gini coefficient fell from 0.70 to 0.61 in 2006 when these services were included in household income. Subsequently, the Gini coefficient was reduced by 0.09 points. The balance of these two adjustments produces the following coefficients for income distribution in 1993 and 2006: 0.545 and 0.616. If we include direct taxation, the coefficient decreases to 0.590 in

2006. These figures, which reflect a very high level of inequality in 2005, seem to us a more accurate reflection of reality.

Egypt

The World Bank database shows consumption expenditure distributions for 1991 and 2004. We have used these data (adjusted) to produce an income distribution (+ 0.05 points).

Maghreb

The Morocco Living Standards Survey is available for 1991 and 2007.

In Tunisia there are only two consumption surveys available, for 1990 and 2000 (the National Survey on Household Budgets, Consumption and Living Standards). As this is conducted every ten years no more recent data are available.

We used these dates for the period 1992-2008 and adjusted them (+0.05) to produce an income distribution based on the distribution of consumption. For Algeria, we have assumed no change in distribution because of a lack of data (there are only two household consumption surveys, dating back to 1988 and 1995).

To calculate income distribution in the Maghreb, we produced an estimate of distribution in 15 categories (three times the five quintiles in each country) and obtained a very slight increase of +0.01 points because distributions in Algeria and Tunisia are stable (one assumed, the other observed), but the coefficient in Morocco has increased by 0.01 and inequalities between the three countries have also risen slightly: average incomes are very similar in Algeria and Morocco but have increased from +26% to +80% of the average in Tunisia; the effect of the increase is mitigated, however, by Tunisia's limited weight in the total income of the Maghreb (18 to 20%).

Nigeria

In the absence of recent data (there are only two surveys on consumption and income, carried out in 1992 and 1996), we have used the estimate of distribution from the AER database 2002, which equates to the estimate for income distribution in 1996.

Ivory Coast, Ghana and Kenya

POVCAL NET provides distributions for expenditure in 1993 and 2008 in Ivory Coast, 1991 and 2005 in Ghana and 1992 and 2005 in Kenya. The Gini coefficient for the first two countries has risen by 0.04 points whilst for Kenya it has fallen by 0.09 points; Kenya alone represents almost half the total income. In addition, whilst average income was the same in all three countries in 1992, it rose by half in Ghana but stagnated in the other two between 1992 and 2008. After estimating distribution on the basis of 15 categories with five quintiles per country, we calculated a drop in the Gini coefficient of 0.03 points overall.

LATIN AMERICA

Argentina and Chile

According to Cornia and Martorano (2010), Gini coefficients for income distribution in both countries varied in exactly the same proportion, but the opposite direction, between 1990 and 2007, i.e. +3.4% in Argentina and -3.4% in Chile. According to Lopez-Calva and Lustig (2009), the coefficients in 2007 were 0.482 in Argentina and 0.518 in Chile. The size of the two economies (which had the same GDP per inhabitant in 1992) were different: Argentina represented 70% of the

total and Chile 30%. This explains the value of the Gini coefficient used, i.e. stable from 1992 to 2008, at 0.49.

Brazil

According to Lopez-Calva and Lustig (2009), Gini coefficients varied widely from 1991 to 1993, i.e. 0.598, 0.580 and 0.602. We have therefore used the average for the three years, namely 0.593. The coefficient has fallen regularly since 1997 and was 0.552 in 2007, a drop of 0.041. Both figures were used in the database for 1992 and 2008. These estimates relate to *per capita* household income, i.e. primary income plus cash transfers. These have contributed to a decline in inequality, combined with the decrease in inequalities in primary income.

Colombia, Peru and Venezuela

According to Cornia and Martorano (2010), the Gini coefficient in Colombia increased by 6.1% between 1990 and 2007. As the Development Data Group source from the World Bank shows a coefficient of 0.584 in 2007, we have calculated a coefficient for 1990 of 0.550. According to Lopez-Calva and Lustig (2009), the Gini coefficient in Peru fell from 1997 to 2006, from 0.54 to 0.49. Finally, according to Cornia and Martorano (2010), the coefficient for Venezuela was the same in 2007 as in 1990. Based on 15 income groups (3 x 5 quintiles), we obtain an overall decline in inequality, from 0.545 to 0.530, because inequalities in average GDP per inhabitant have fallen sharply: GDP per inhabitant in Peru (\$2,931 in 1992) has increased by 84%, in Colombia (\$4,893) by 29% and in Venezuela, the wealthiest of the three (\$9,382) by 13%.

ASIA

China

Estimating income distribution in China is both difficult and important, given the influence of within inequality within the country compared with overall within inequality and with global inequality. Estimating is difficult because of the pricing system, with subsidised consumer goods reserved for a minority of the population, shopping vouchers handed out to employees of major state-owned corporations and sales of private homes in the cities at prices well below their market value (Davies 2008).

Estimating raises two different problems: selecting a distribution for the period around 1992 and measuring the increase in inequality between 1992 and 2008.

Sources on inequality around 1992 do not agree. On the one hand, some studies (Chotikapanich et al. 2007; Kanbur and Zhang 2005) suggest low Gini coefficients: 0.306 in 1991 (Chotikapanich et al. 2007), or even lower according to Kanbur and Zhang (2005), who propose 0.303 in 1999, a relatively low figure given the definite increase in inequality between 1992 and 1999. Other authors suggest much higher figures, for example Khan et al. (1992), i.e. 0.382 in 1988, with a share for the fifth quintile of 49%. Khan et al. (1992) believe they underestimate inequality because the value attributed to subsidies is too low, as is the share of income from private businesses in household income (1%). In addition, the gap in average incomes between rural and urban populations is thought to have been underestimated. According to Rawski (1982), inequality may be even higher: the share for the fifth quintile is thought to have been calculated at 51% in 1978 by valuing subsidies at a third of their value (compared with 59% at their full value). If the figure of 51% for 1978 were correct, the figure for 1988 would have to be higher than 52% and therefore there would be at least a three-point differential with the figure put forward by Khan et al. (1992).

In order not to overestimate inequality in 1992, we have used the estimates produced by Khan et al. (1992) because of their own comments and those made by Rawski (1982). It is likely that Chotikapanich et al. (2007) did not take account of the adjustments required by the pricing system and directly reused the statistics on incomes in rural and urban areas published in the "China Statistical Yearbook".

On the other hand, we did use the estimates of Chotikapanich et al. (2007) for changes in income inequality, assuming that the bias towards underestimating was constant. This was a decisive choice, as the Gini coefficient increased according to Chotikapanich et al. (2007) by 0.095 between 1991 and 2003 (from 0.306 to 0.401). In the absence of more recent figures, we have assumed that this increase was also valid for 1991 to 2008. It seems highly unlikely that it would have fallen between 2003 and 2008.

We have thus combined a reference from 1992, which takes account of various divergent elements, with a reference to the increase from 1992 to 2003, based on official estimates. This suggests a Gini coefficient of 0.390 in 1992 (to take account of a slight increase between 1988 and 1992) and 0.485 in 2008, i.e. an increase of 0.095, like the increase between 1991 and 2003 according to Chotikapanich et al. (2007). These figures agree with the most recent estimate of distribution in China, produced by Liang (2011), which gives annual figures for the period 1986 to 2008. The author combined the official statistics showing rural and urban populations by income tranche (using different tranches). He calculated a Gini coefficient of 0.454 in 2008 (with a very slight increase from 2003 to 2008). A discrepancy of 0.031 between this figure and the one we have used is plausible, given that Liang did not take account of subsidies.

Our estimate apparently agrees with that of Ravallion and Chen (2007) that used a primary source, the household surveys realised in partnership with the World Bank. For 1992 they obtained a Gini of 0.39 which rises to 0.45 in 2001. It is true that they get lower figures when an adjustment is made to take into account discrepancies in living cost between rural and urban areas. But no adjustment is made for subsidies to urban households, so we have retained the figures cited above. It must be added however that subsidies probably decreased since 1992. Therefore we may have slightly overestimated inequality in 2008 when proposing 0.48 for this year. Since no survey on these subsidies in order to estimate their impact on income distribution is feasible, estimates can only be approximate.

The 1992 figure is close to the figure for India over the same period, whilst the 2008 figure reflects the growing contrast between rural and urban areas. The share of the fifth quintile in 1992 (48%) is close to the figure obtained by Khan et al. (1992) and rose to 55% in 2008, which equates to a gap of between one and over eight between the average incomes of the poorest 40%, mainly in rural areas, and the richest 20%, mainly in urban areas. Given the size of the Chinese population, this means that 260 million Chinese have attained GDP per capita of \$18,000, a figure close to GDP per capita in Spain.

India

The WIDER database gives household expenditure distributions for 1992 and 2004, which equate to an increase in the Gini coefficient of 0.04. We have reused these distributions, increasing the Gini coefficients by 0.05 to reflect incomes. This produces two Gini coefficients for 1992 and 2008: 0.370 and 0.410.

Indonesia

Household expenditure and income distributions are available for 1993. In addition, the same source (SUSENAS, Socio-Economic Survey) gives an expenditure distribution for 2005. For 1992, we have reused the income distribution for 1993 (Gini coefficient: 0.411). For 2008, we have used the

expenditure distribution for 2005, with an increase of 0.05 for the Gini coefficient and a very slight adjustment of -0.004 (to give a Gini coefficient of 0.433) to mitigate an increase which is contradicted by other studies. Leigh and Van der Eng (2009), in fact, use the same surveys to obtain a significant decline in both the 10th decile and the 20th vintile between 1993 and 2004.

Bangladesh, Myanmar and Pakistan

In the absence of data for Myanmar (which represents only a small share of GDP for the three countries), we have estimated distribution in the other two. The only data available are for the distribution of household expenditure. From 1993 to 2005, the Gini coefficient for Pakistan decreased, from 0.313 to 0.286, whilst it increased in Bangladesh (from 0.262 to 0.305). At the same time, however, the gap in average incomes between the two countries decreased between 1992 and 2005; average income in Bangladesh increased from 39% to 48% of that in Pakistan. This phenomenon partly explains the change in income inequality in both countries considered together: from 0.431 to 0.396, resulting from the decline in within inequality in Pakistan and between the two countries, with this effect carrying more weight than the increase of inequality in Bangladesh (we have introduced an adjustment of +0.5 in moving from expenditure to income and estimated distribution in the 10 groups equating to the quintiles in the two countries.).

South Korea and Taiwan

Comprehensive data are available for both these countries. Household surveys concerning households' available cash income were carried out in 1992 and 2010. Two similar surveys were conducted in Taiwan for 1991 and 2008. Inequality has fallen slightly in Korea (which represents two thirds of the two countries' GDP) with Gini coefficients of 0.344 and 0.336, and has increased in Taiwan, from 0.297 to 0.332. In addition, the gap between average incomes has lessened and is becoming insignificant, with average incomes in Korea compared with Taiwan increasing from 0.925 to 0.980. The result of these three factors is a slight fall in the Gini coefficient between 1992 and 2008: from 0.353 to 0.331.

Philippines and Thailand

We have household surveys for both these countries, which periodically measure both expenditure and income based on the same methodology. We used two surveys carried out in the Philippines in 1992 and 2006, and two in Thailand in 1992 and 2007. Income inequality has declined in both countries. The Gini coefficient decreased from 0.519 to 0.492 in Thailand and from 0.567 to 0.529 in the Philippines. Inequality between the two countries in terms of average incomes, however, increased: average income in the Philippines compared with Thailand fell from 0.40 in 1992 to 0.34 in 2008. Consequently, income inequality for all estimates for the 10 groups is stable. Distribution was calculated per decile and per vintile, resulting in a Gini coefficient of 0.510.

RUSSIA

We have two sources: the first, cited by POVCAL, is an annual household consumption survey, which does not provide any income data; the second, cited by WIDER, is the "Russian Longitudinal Monitoring Survey", which collects data on consumption and incomes and is renowned for the quality of its research. As we only had access to data from 1992 to 2000 from this source, we reused the estimated distribution from 1992 and extrapolated it for 2008 based on the distribution in 2000, assuming that the variation in the Gini coefficient between 2000 and 2008 was the same as for consumption based on the first source referred to above.

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