Where in the world are you? Assessing the importance of circumstance and effort in a world of different mean country incomes and (almost) no migration

Milanovic, Branko

World Bank

6 June 2007

Third draft
Comments welcome
June 2007

Where in the world are you? Assessing the importance of circumstance and effort in a world of different mean country incomes and (almost) no migration

Branko Milanovic[1]
Development Research Group, World Bank

Suppose that all people in the world are allocated only two characteristics: country where they live and social class within that country. Assume further that there is no migration. We show that 90 percent of variability in people's global income position (percentile in world income distribution) is explained by only these two pieces of information. Mean country income (circumstance) explains 60 percent, and social class (both circumstance and effort) 30 percent of global income position. But as at least 1/3 of the latter number is due to circumstance as well, the overall part of circumstance is unlikely to be under 70 percent. On average, "drawing" one-notch higher social class (on a twenty-class scale) is equivalent to living in a twelve-percent richer country. Once people are allocated their social class, it becomes important, not only whether the country they are allocated to is rich or poor, but whether it is egalitarian or not. This is particularly important for the people who "draw" low or high social classes; for the middle classes, income distribution is much less important than mean country income.

JEL classification: D31; I3; 057
Key words: Global inequality, income distribution, migration
Number of words: about 10,300

[1] I am grateful to Patrick Conway, Jim Davies, Francisco Ferreira, Misha Lokshin, Jaime Pozuelo Monfort, John Roemer and participants at the World Bank conference on Global distributive justice held on May 1-2, 2007 in Washington for very helpful comments and suggestions. The views expressed in the paper are only author's and should not be attributed to the World Bank and its affiliated organizations.

1. Setting the stage

In Rawls's *Law of Peoples* individuals from various countries meet to organize a contractual arrangement regulating their relations in a metaphor similar to the justly celebrated one for the citizens of the same nation from his *Theory of Justice*. There are differences though in the global gathering since the meeting is between representatives of each nation (people) rather than between all world individuals. And the outcome is different too, in two important respects: Rawls rejects the application of the global difference principle in favor of fairly limited aid to the "burdened peoples" that are hampered by poverty from achieving a "decent" society, and assumes that migration takes place only in response to egregious violation of human rights, famines, and political and religious oppression. In other words, regarding the two aspects which concern us here, global redistribution is minimal and with a clear cut-off point,[2] and economically-driven migration is not approved.[3] Thus, peoples are basically separated entities.

We shall take Rawls's assumptions as a fair representation of the existing world situation. Indeed, they are. In 2004, aid from rich to poor nations amounted to one-quarter of one percent of rich nation's Gross Domestic Income.[4] At the same time, these nations were spending, on average, more than 30 percent of GDI for domestic social transfers. Obviously, domestic and foreign poor are not treated equally: one "domestic poor" is worth, on average, about 100,000 "foreign poor (Milanovic, 2006). Similarly, using an optimal taxation framework, Kopczuk, Slemrod and Yitzhaki (2005), calculate that the implicit weight US policy places on a poor non-citizen is 1/2000 of the implicit weight it assigns to an American poor. Second, in 2002, total migration from poor to rich countries was 2.6 million of people which represented a tiny percentage (less than 1/20 of one

[2] Not having open-ended international transfers was one of key points explicitly stressed by Rawls (1999, p. 106 and p. 118).

[3] See Rawls (1999, p. 39 and p. 74).

[4] See http://www.oecd.org/dataoecd/17/39/23664717.gif, accessed February 9, 2007. This includes only Development Assistance Committee (DAC) members (basically, the "old OECD" countries).

percent) of more than 5 billion people living in poor countries.[5] So, both of Rawls' assumptions (or desiderata) seem to hold.

But we shall, for the sake of exposition, modify the Rawlsian metaphor in so much as we shall let the global assembly (i) be the one of all individuals in the world, and not of peoples' representatives, and (ii) not be designed for the individuals to reach a contractarian arrangement. As is customary (from *Theory of Justice*), individuals meet behind the veil of ignorance. At our original position, each of them is allocated two characteristics that will determine his fate: county and social class within that country. [6] As we have just seen, assignment to a country is "fate" since there is no inter-country movement of people. Assignment to social class can also be seen as "fate" if there is no social mobility within countries. At the other extreme, with perfect social mobility, assignment to social class would not matter as each individual would find, through his own exertion and luck, his merited position in society.

We know that differences between mean country incomes, and differences in income between social classes within countries are large. From the work on global inequality (Milanovic 2002, 2005), we also know that about three-quarters of global inequality is due to between-national income differences. Consequently, to what nation one gets allocated is indeed of significant import for own's life chances. By being allocated to a country, the individual receives two "public" goods that are unalterable by his own effort and that are basically fixed during the largest part of his/her life: mean income of the country (relative to the rest of the world) and national level of inequality. This represents, of course, a somewhat strong assumption. While these parameters are unalterable by any one's individual effort, there are indeed many examples that within one's lifetime the relative position of a country has been transformed, whether by being

[5] See http://www.oecd.org/dataoecd/61/37/34607274.pdf, accessed February 9, 2007. The poor and rich countries are defined here conventionally: the rich as OECD members, the poor as everybody else.

[6] If there are N countries, the probability of being assigned a given country is 1/N. In other words, the probability does not depend on country's population. We work here with countries alone, or with Concept 1 (Milanovic 2005). One could of course envisage a different "lottery" where the probability of being assigned a country would be proportional to its population size, or even to its share of the people born in a given year.

improved, as in the case of China over the last quarter century, or worsened as in the example of Argentina after World War II, or many African and transition countries more recently. Even national inequality, measured by the Gini coefficient, which, as Li, Squire and Zou (1998) show, tends to be fairly sluggish, can experience, at times, violent swings. The increases in inequality during the first stage of transition from planned to market economy (including in China), or under the Thatcher-Reagan rule in the UK and the United States, are such examples. For simplicity, however, we shall assume that, for an individual, both mean country income and inequality in his country of assignment are given and unrelated to any effort or desert from his part. They are thus two "morally arbitrary" features allocated to him (see Pogge 1994. p. 197; Nagel 2005, p. 119). They will be referred to as "circumstances" (Roemer 1998).

Assignment to social class is more ambiguous in its effects than the assignment to a country: on the one hand, assignment to low (or high) social class will determine to a large extent individual's life-time prospects and hence his life-time income. One may (almost) argue that there are no reasons for thinking that being assigned to a top or bottom social class may not be as much a position unalterable in one's life as being assigned to a country. Yet, there is some inter-class social mobility in practically every society with some countries closer to one theoretical end of the spectrum (no social mobility at all) than to the other (full social mobility, *viz.* irrelevance of social class "assigned" at birth).[7] In that sense, assignment to social class cannot be regarded as much part of "fate" as country assignment in a world with no migration. However, because of existing various levels of social mobility within the countries, country assignment will also determine what extent of social mobility one may hope to achieve. In the rest of the analysis, we shall (at first) assume, rather generously, that most of social movement within country is the result of personal effort and luck.[8] In other words, if we find people

[7] But surely, we cannot think of any country where assignment to social class (at birth) is irrelevant for one's future prospects.

[8] Assignment to a social class differs from the "assignment" of an unalterable Gini coefficient. Since individuals are allowed to move up and down along the social scale of their country, the first assignment has to do with mobility. The second (the Gini coefficient) has to do with inequality of distribution, or more exactly with a share of each social class in total income. Thus, a society can be very unequal—in the sense that the relative income of the poor is low—while at the same time it allows for high mobility (in the sense,

in a given social class within their nation, we shall assume that being there (largely) reflects their work effort and luck. It is the second part of Roemer's dichotomy: the "effort."

This issue can be set into more explicitly Roemerian (1998) terms. Suppose that we observe two distributions of outcome (income) that correspond to two unknown distributions of effort (Figure 1, panel a). If we believe that the oucomes are strongly influenced by unequal circumstances such as different mean incomes of the two countries, Roemer's definition of equality of opportunity requires that people whose effort, conditional on circumstances, is the same be rewarded equally.[9] Suppose that the two individuals whose effort thus defined is the same (that is, they are at the same percentile, 1-*p*, of their countries' effort distributions) are A and B. If we adjust for the advantage conferred by higher mean income to A, and still obtain a distribution of income such as shown in panel b, we may conclude that there are other circumstances for which we have failed to adjust. They could be country-specific institutions, policies and norms that limit social mobility or more generally that drive the wedge between the outcomes and individual effort expended,. These additional factors also confer "advantages" to individuals and have to be included under the rubric of "circumstance". Panel c shows the situation when we have adjusted for all (reasonable) circumstances that may give advantage to one or the other individual (some circumstances may work in favor of one, and others in favor of the other person). To put it more succinctly, circumstance for each type of individual *j* (where type here is defined by citizenship)

---

that being born poor does not "condemn" one to remain in that class). It is often thought that the US, compared to Europe, exemplifies precisely such a society, even if recent studies (Blanden, Gregg and Machin, 2005) have cast doubt on the superior social mobility in the United States. See also the discussion in Jackson and Segal (2004, p.p. 29-30).

[9] In other words, conditional on circumstance, people at the same percentile of effort should be rewarded the same (or treated equally). Roemer (1998, Chapter 3) distinguishes between relative effort ("degree of effort") and absolute effort ("level of effort"). Relative effort is effort expended compared to what is expected with a given set of circumstances. Equality of opportunity requires that the outcomes be the same for each percentile of the distribution of effort (that is, for each relative effort) allowing thus the same absolute effort to be be rewarded differently.

consists of two parts: μ_j and s_j where μ_j = mean income of country *j,* and s_j = country-specific part of circumstance in addition to mean income. [10]

Having thus set the stage, the questions we want to ask are the follows. How much of one's life chances will be determined by his assignment to a given country vs. given social class? Does this systematically vary with social class? How much can one improve one's position in world income distribution through his own effort (that is, by climbing social ladders in his country)? What does this tell us about equality of opportunity across all individuals in the world? Or, what does it tell us about morally arbitrary inequality at the global level, inequality which, according to Rawls (1971, Chapter II), ought to be, within each nation-state, reduced or eliminated? [11]

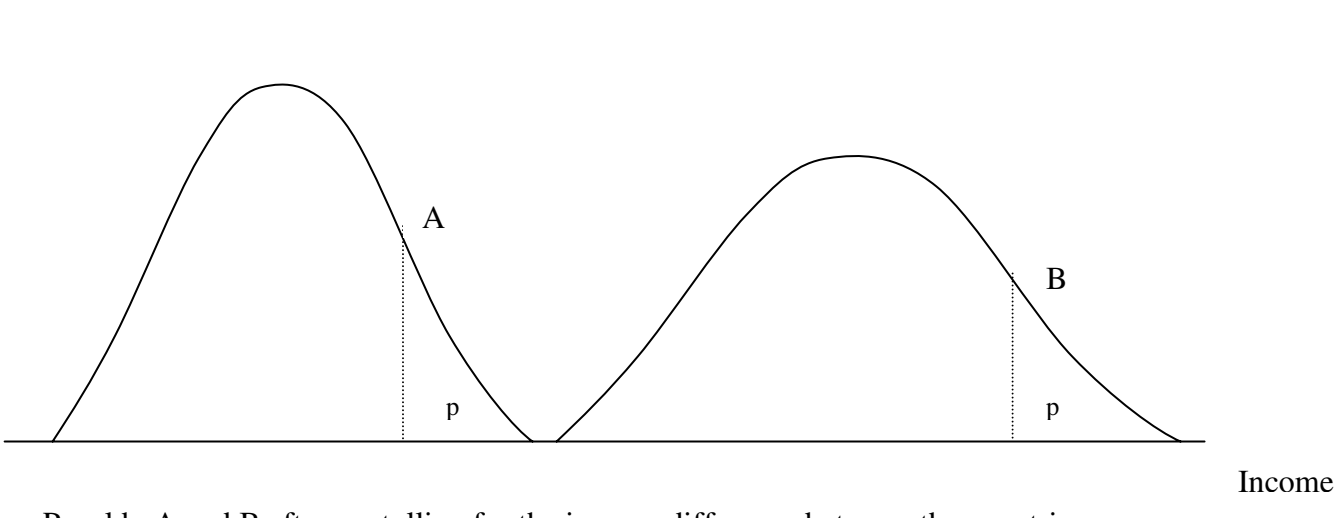
We shall first (section 2) describe the source of global income distribution data that help us address these questions empirically and review our definitions of country and class. In Section 3, we present some broad regularities regarding the way global income is distributed between countries and social classes. Sections 4 and 5 are the core parts of the paper: they present the analysis that attempts the answers the questions posed above. The last part gives the conclusions.

[10] Note that the income distributions, thus fully "cleared" of all circumstances, may still be of different shapes: the distributions of effort may be different.

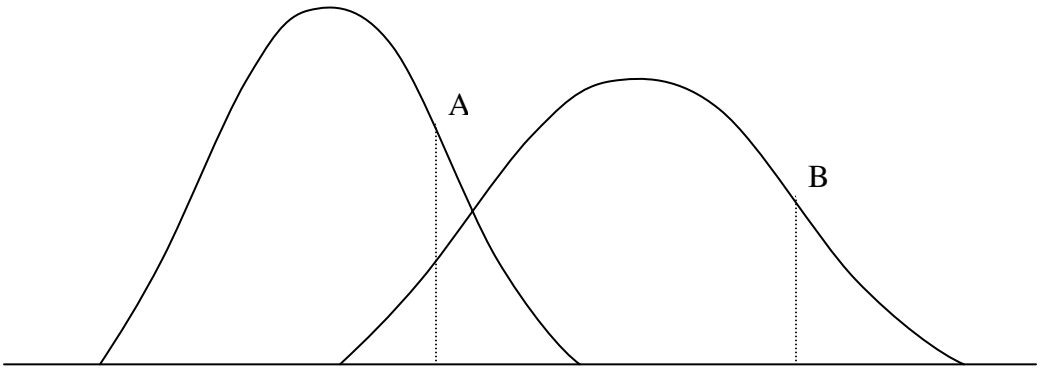
[11] "..the most obvious injustice of the system of natural liberty is that it permits distributive shares to be improperly influenced by these factors [initial distribution of wealth; one's birth] so arbitrary from a moral point of view. The liberal interpretation…tries to correct for this by adding to the requirement of careers open to talent the further condition of the fair equality of opportunity" (Rawls, 1971, p. 63).

Figure 1. Equality of opportunity for two different types of individuals

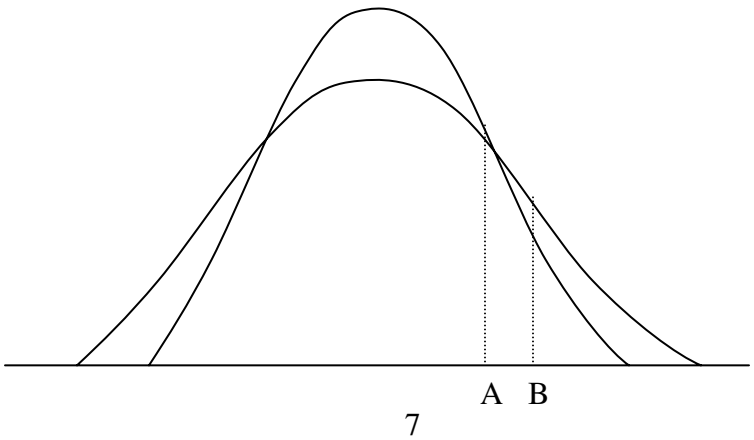
Panel a: A and B are at the same percentile (1-*p*) of distribution of effort for two different types (rich and poor country)



Panel b. A and B after contolling for the income difference between the countries



(c) A and B after controlling for differences in income and social mobility



2. Data and definitions

The data used in the paper come from the World Income Distribution (WYD) database constructed to study the evolution of global inequality. The database is comprised almost entirely of micro data from representative household surveys from most of the countries in the world. For the benchmark year 2002, which is used here, the data come from 123 household surveys representing 120 countries[12] and accounting for 94 percent of world population and 98 percent of world dollar income.[13] The geographical coverage is almost complete for all parts of the world except Africa (see Table 1).

Table 1. Population and income coverage of the surveys (in %)

	Africa	Asia	Latin America	E.Europe and CIS	WENAO	World
Population	77	96	96	97	99	94
Income	71	95	95	99	100	98
Number of surveys (countries)[1/]	29	26	21	26	21	123

Source: World Income Distribution database.
Note: WENAO is Western Europe, North America and Oceania (Australia and New Zealand). CIS = Commonwealth of Independent States.
Eastern Europe included all formerly Communist countries (including CIS countries).
[1/] For China, India and Indonesia both rural and urban surveys are included.

For the vast majority of surveys (117 out of 123) we had access to micro data which means that any type of distribution (by decile, ventile, percentile; by households or individuals) could have been created. In order to limit the number of data points and make the analysis manageable and intelligible we have limited the number of data points per country to 20 ventiles (each ventile contains 5 percent of country's population). All individuals in a survey are ranked from the poorest to the richest according to their household per capita income (or expenditures, depending on what welfare aggregate is used in the survey). Since not all countries produce annual surveys, we had to use a

[12] For China, India and Indonesia we have both rural and urban surveys.

[13] We cannot express the share of the included countries in terms of $PPP income because for most of the countries for which we lack surveys, we also lack PPP data (e.g. Afghanistan, Iraq, Sudan etc.) The dollar incomes however are typically available.

"benchmark" year (2002 in this case), that is, try to get the 2002 household surveys for as many countries as possible, but where there were no surveys conducted in 2002, to use a year as close to it as possible. In the event, 81 surveys were conducted in the benchmark year or one year before or after it, and 115 surveys within two years of the benchmark. These 115 surveys cover 5,733 million people, *viz.*, practically all people (98.8 percent) who are included in the analysis here. For the surveys conducted in non-benchmark years, we adjust reported incomes by the Consumer Price Index of the country so that all amounts are expressed in 2002 local currency units. These amounts are then converted into international (PPP) dollars using the 2002 estimates of $PPP exchange rates provided by the World Bank. Thus, for each income group (ventile) for each country we calculate the average per capita amount of PPP dollars received as income (or spent in the form expenditures). [14]

The fact that each country is divided into 20 groups of equal size (ventiles) is extremely helpful. [15]This allows us to compare the positions of say, the third ventile of people in China with the seventh ventile of people in Nigeria etc. It also allows us to define social classes the same way across all countries. To fix the terminology, we shall call each ventile a "social class". The terms will be used interchangeably although of course I am aware that, from sociological point of view, social class is a much richer and complex phenomenon than conveyed by a mere position in a distribution of income. Social classes thus run from 1 to 20 with 20 being the highest. Social class determines a person's position in national income distribution.[16]

[14] Obviously, each ventile is of equal size for any given country. Between countries, ventile sizes are quite different: one ventile in China consists of 64.7 million people while, at the other extreme, Luxembourg's ventile, has only 200,000 people. China, India and Indonesia ("whole" countries) are used in the rest of the analysis rather than their separate urban and rural surveys.

[15] We have a total of 115 countries; five countries have fewer fractiles than twenty and they are omitted from the analysis.

[16] "Income class" might have been a more accurate appellation but in order to emphasize social (and income) position within a nation, I prefer "social class."

Social class and country of residence pin down a person's position in global income distribution.[17] That position is expressed by his percentile rank in the overall world income distribution (given by his household per capita income or expenditures expressed in dollars of equal purchasing power). A person can be, say at the 72nd percentile in the world—implying that his income is higher than incomes of 72 out of each 100 people in the world. This will be referred for simplicity simply as "position" or "position in the world." Since we divided the world into one hundred percentiles according to per capita income, the position runs from 1 (lowest) to 100 (highest). Each percentile contains, of course, 1/100th of world population included in the analysis here, i.e., approximately 57 million people.

We now move to some empirical issues showing how the world thus "partitioned" onto countries and social classes really looks.

3. Diversity of the world

Figure 2 combines the two aspects, of social (within-national) and international (differences in mean countries' incomes) distributions. Income of each ventile is shown in the global distribution. Consider Germany. Since Germany is a rich country, and its income inequality is moderate, most of its population will be highly placed in world income distribution. The poorest German ventile is at the 73rd percentile of world income distribution. All other ventiles are obviously higher, and the richest ventile belongs to the top world percentile. The same interpretation is for all other countries. We call such curves "the position curves". Unlike Germany, where the span between the richest and the poorest ventile is 27 percentiles, in China, the distribution covers a much wider range from the third to the 85th percentile. Brazil, with its unequal income distribution, covers practically the entire global spectrum, from the lowest percentiles to the richest. India, in contrast, is shown to be fairly poor with the poorest ventile belonging to the 4th poorest percentile of the world and the richest ventile to the 70th. This last position shows that

[17] As mentioned, the household surveys we use are both income- and expenditure (consumption)-based. For simplicity of presentation we speak throughout of "income" distribution and "income position in the world."

the richest people in India (as a group—admittedly a large one since it contains more than 50 million people) have lower per capita income than the poorest people (as a group) in Germany. In other words, there is no overlap between the two distributions: if we picture the two distributions, with income on the horizontal axis, the Indian income distribution will end before the German distribution starts. This "no overlap" condition is not satisfied for any other two distributions shown here.

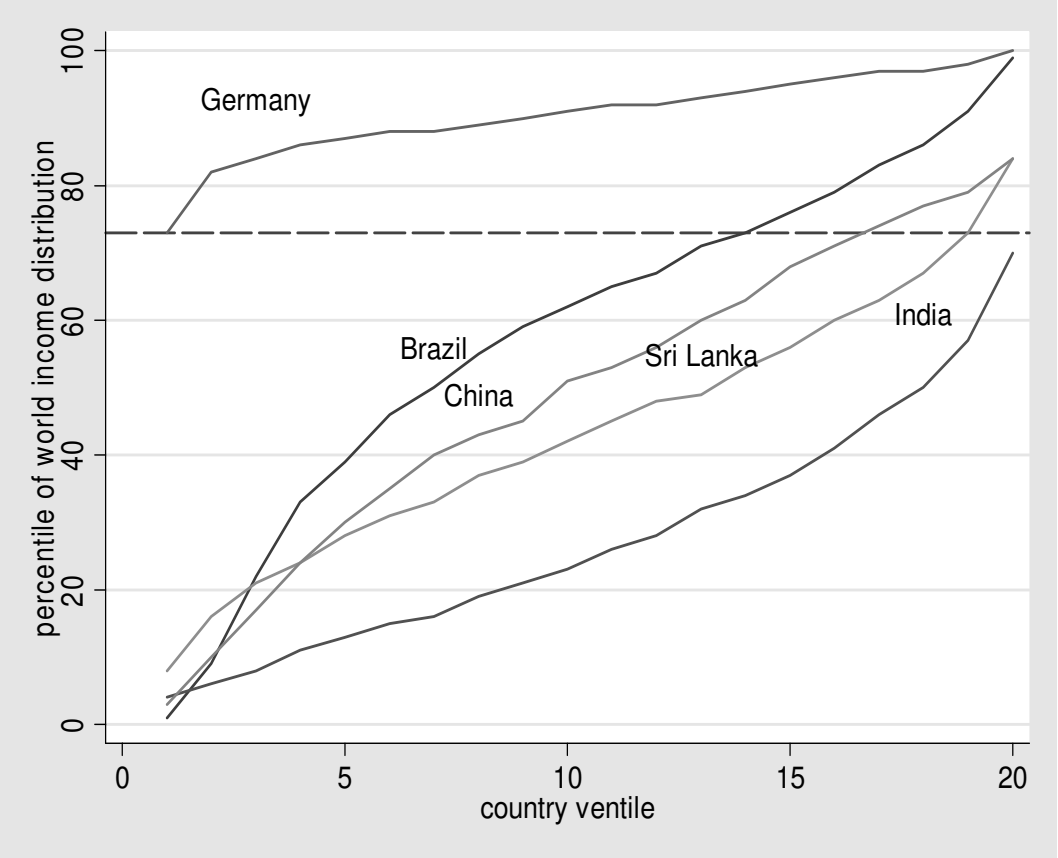
The graph can also be read as a type of the generalized Lorenz curve where instead of the income level on the vertical axis, we have income position in the world. The advantage of this "positional" approach is that it reduces the measurement error, [18] but since position is bounded from above these specific generalized Lorenz curves will in many cases be concave rather than (as we are used to) convex. The interpretation however is the same as with generalized Lorenz curves.[19] From Figure 2 we can easily conclude that Sri Lanka's distribution is first-order dominant with respect to India, and that Germany's distribution is first-order dominant compared to any other country (although barely so to Brazil at the very top of income distribution). [20] No first-order dominance can be established between Brazil, China and India because of the situation at the bottom where the poorest Brazilians are shown to be poorer than the poorest people in India and China. Of course, the middle class Brazilians (approximately people in the ventiles 7 through 15) are better off than the middle classes in China, Sri Lanka and India. One may also note that the biggest difference in the position holds for the poorest ventiles: while in Germany, the poorest ventile is at the 73rd world percentile, in the other four countries, the poorest ventiles are at the very bottom of the global income distribution.

[18] Household surveys do not measure income or expenditures perfectly. They are less likely however to make such large mistakes that may result in misplacing of individuals into "wrong" world percentiles.

[19] First-order positional dominance *must* imply first order income dominance. The reverse may not hold because the distribution may be income dominant but the difference in income may be so small as to place a social class from both countries into the same global percentile.

[20] Notice that the first-order dominance is a less demanding requirement than the "no overlap" requirement. The latter implies the former.

Figure 2. The position curves: inequality in the world—by countries and by social class



Source: World Income Distribution (WYD); benchmark year 2002.

World income distribution can be conventionally broken down into that part of inequality which is due to the differences between mean country incomes, and that part of inequality due to inequality within countries. All studies show that the between inequalities are much more important. [21] Using 2002 data, Table 2 shows the actual global inequality between individuals, and inequality that would have existed if all people in each country had the mean income of their country. As can be observed, depending on the inequality measure, between 66 and 87 percent of global inequality is due to differences in mean incomes. Taking the Gini coefficient, which is the most frequently used measure in global inequality studies, income differences between world citizens

[21] See, for example, Milanovic (2002, p.78 and 2005, p. 112), Sutcliffe (2004), Bourguignon and Morrisson (2002, p. 734), Berry and Serieux (2007, p. 84).

amount to 65.5 Gini points out of which 55.7 points are due to the between-country component.[22]

Table 2. Global income inequality and the between-country component of it (benchmark year 2002)

	(1)	(2)	(3)
	Global inequality between individuals	The between-country component of global inequality	Share of (2) in (1) (in percent)
Relative mean deviation	0.517	0.450	87
Coefficient of variation	1.751	1.278	73
Standard deviation of log of incomes	1.234	0.982	80
Gini coefficient	0.655	0.557	85
Mehran measure	0.783	0.683	87
Piesch measure	0.591	0.494	84
Kakwani measure	0.357	0.274	77
Theil entropy measure	0.835	0.579	69
Theil mean log deviation	0.846	0.562	66

Source: World income distribution (WYD) database. All income expressed in 2002 international dollars.

[22] The between component of global inequality is the same thing as Concept 2 inequality (Milanovic, 2005). Global inequality between individuals is also called Concept 3 inequality.

4. The relative importance of country vs. social class (or effort vs. circumstance)

Predicting global income position based on knowledge of country and class (in the aggregate)

As we have seen, one's position depends on two factors: allocation to a country and allocation to a social class. We can write for *i*-th individual living in *j*-th country:

$$P_{ij} = b_0 + b_1 m_j + b_2 G_j + b_3 C_{ij} + \varepsilon_{ij} \qquad (1)$$

where P_{ij} = income position (percentile) in world distribution, m_j = mean country income, G_j = national inequality (say, Gini coefficient), and C_{ij} = person's social class in country *j* and ε_{ij} = the error term..

The results of estimation of (1) are shown in Table 3.[23] We begin by asking how much of one's global income position is explained by country's mean income alone (regression 1). The answer is 60 percent. Note that each increase of 10 percent in mean country income raises person's position in the world by about 2.3 percentiles. But when individuals are allocated a country, they are not only allocated its mean income but also its inequality level. Including both of them in the regression however does not make much of a difference (regression 2). [24]

By putting together country and social class (regression 3), we are able to explain more than 90 percent of the variation in people's positions in the global income distribution. As before, each 10 percent increase in mean country income lifts a person, on average, by 2.2 percentage points in the world distribution. Being placed in a higher

[23] The regressions are run unweighted implying that each country (regardless of its population) matters equally. This makes sense from the point of view of the original position where, for an individual, the probability of being assigned to any given country is the same. The Rawlsian lottery would be different if probabilities of country assignment were proportional to the population sizes of the countries. It is not an unreasonable assumption but it departs considerably from the Rawlsian metaphor.

[24] Each Gini point increase will, on average, lower person's position by about 0.33 percentage points. This, of course, holds only in the aggregate. If we break individuals by social class, then living in a more unequal country (and controlling for mean income) would be advantageous for higher-class individuals. And the reverse for people allocated to low social classes. This point is pursued below.

social class increases one's position by 2.8 percentiles on average. Thus, in the aggregate, belonging to one-notch higher social class is equivalent to residing in a country whose mean income is 12 percent higher. The trade-off between social class, or what we may consider to be a partial reflection of one's effort, and the morally arbitrary placement in a rich county is now clear. If one were, through his effort and luck, to climb eight social classes, he would have "traversed" the road equivalent to being born in a country about twice as rich.

When we break the importance of "circumstance" (country) and "effort" (social class) in explaining one's position in global income distribution, we find that 63 percent is due to the country of residence, and 31 percent to social class.[25] However, social class can be fully treated as "effort" only if we are willing to argue that (1) social class a person is assigned at birth and social class he is in now are totally orthogonal, and that (2) the latter is dependent on his effort (and luck) alone. More formally, we can express that situation as the one where the correlation (ρ) between one's current income and his parents' income is zero. At the other extreme, with no social mobility at all, one's social class at birth determines his current social class (observed in the surveys). In that case, the entire social class variable must be "ascribed" to circumstance. [26]

The situation in the real world will, of course, differ between the countries and will lie somewhere between the two extremes. Ideally, if we had the data for the correlation of children's and parental income, we could use these country-specific coefficients to model the actual role of social class. Unfortunately, we have such data for only half a dozen, mostly rich, countries. They show that social mobility is relatively high in Nordic European countries and Canada, that it is less in the United States and the UK, and (arguably) even less in the continental Europe (see Solon, 1999, pp. 1784-89; Checci et al. 1999; Bjorklund and Jantti 1997). The value of ρ ranges from 0.2 in Nordic countries (and in some studies only) to 0.6 There are also some presumptions that in the

[25] This is obtained by the analysis of the variance and is hence independent of the order the regressors are introduced (mean country income before social class or the reverse).

[26] Social mobility is the complement to ρ: $m(t) = 1 - \rho(Y_o, Y_t)$ where $m(t)$ = mobility over the period t, and Y_o and Y_t incomes at respectively times 0 and t.

Third World countries social mobility is less than in the rich world and that it is the least in Africa and Latin America (Lam and Schoeni, 1993). Based on our survey of the literature, we have incorporated these very tentative results into our "base case" scenario on mobility shown in Table 3. To see how the results may be sensitive to different mobility assumptions, we introduce also two different cases: optimistic and pessimistic scenarios, where social mobility is respectively greater or less than in the base case scenario. [27] Notice that the regional ranking by social mobility broadly coincides with the rankings according to inequality. Although, of course, the two concepts are different and can move in the opposite directions, it has been suggested that they are unlikely to do so (Davies et al. 2005).

Table 3. Correlation coefficients between parental and children's income used in the simulations

	Base case	Optimistic (high mobility)	Pessimistic (low mobility)	Gini
Nordic countries	0.2	0.15	0.3	27.5
Rest of WENAO	0.4	0.3	0.5	33.7
Eastern Europe/CIS	0.4	0.3	0.5	30.6
Asia	0.5	0.4	0.6	37.6
Latin America	0.66	0.5	0.9	53.8
Africa	0.66	0.5	0.9	42.6

Source: Gini data from World Income Distribution database (benchmark year 2002).

Once we have assumed correlations for all the countries in the sample, we proceed to the following simulation exercise. Take a country *j* with its correlation coefficient ρ_j. We of course do not know in what ventile of income distributions have been parents of people whom we observe in (say) the bottom ventile. To estimate this, we run a random data generation process

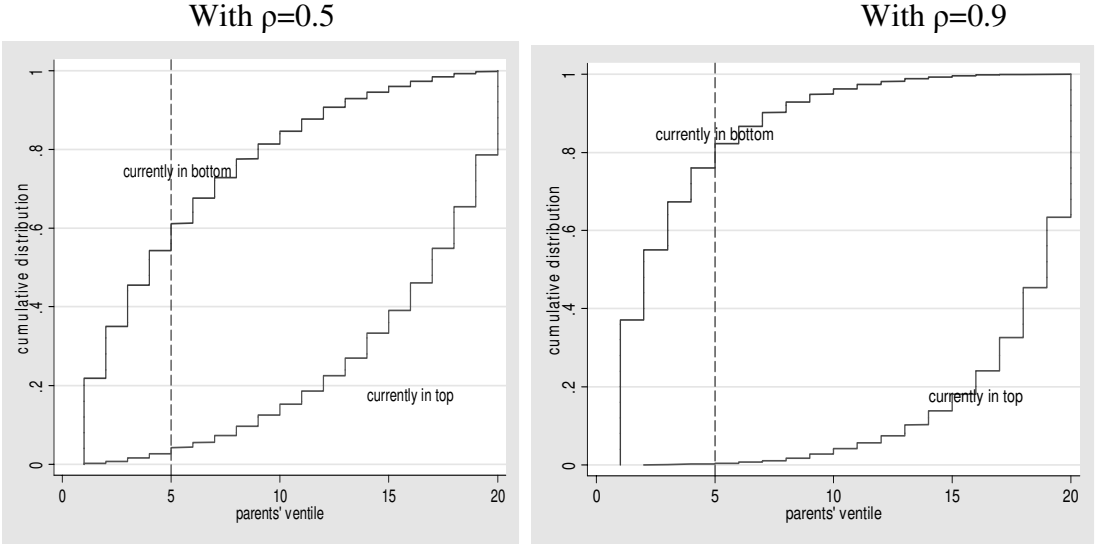
$$y_{ij}^* = \rho_j y_{ij} + e_j \qquad (2)$$

where y_{ij} = income (in logs) of *i*-th individual drawn from a normal distribution, y_{ij}^*= income (in logs) of *i*-th individual's parents (the asterisk denotes parents) and e_j =

[27] A caveat ought to be made. The correlation numbers we use here to motivate the simulations are mostly derived from correlations of children's and parental earnings (not income as we would ideally like).

the error term drawn from a normal distribution N(0,1). After generating incomes of parents and children, we partition both parents' and children's incomes into twenty ventiles, and for each children's ventile calculate the conditional distribution of "past" (parents') ventiles. Figure 3 shows such cumulative conditional distributions for the bottom and top ventile when ρ's take values of 0.5 and 0.9. As can be easily seen, with a high ρ, people whom we currently observe in the bottom (top) deciles are very likely to have come from parents who were also in the bottom (top) deciles. But as ρ decreases, that probability lessens. For example, with ρ=0.9, people who are currently in the bottom ventile come with an almost 80 percent probability from the parents who have been located in the bottom five deciles (right panel in Figure 3). But with greater social mobility (and a lower ρ=0.5), such probability is just over 60 percent. If eventually ρ were to be 0, the distribution of parents' income (or more accurately, the distribution of parents' ventiles) will be the same for each ventile of children.

Figure 3. Cumulative distribution functions of parents' ventile position for the children in bottom and top ventile



Note: simulations based on equation (2). Children's ventiles are labeled "current".

Using thus generated parental ventile positions, we run regressions

$$P_{ij} = \beta_0 + \beta_1 m_j + \beta_2 G_j + \beta_4 C_{ij}^{*}(\rho) + u_{ij} \qquad (3)$$

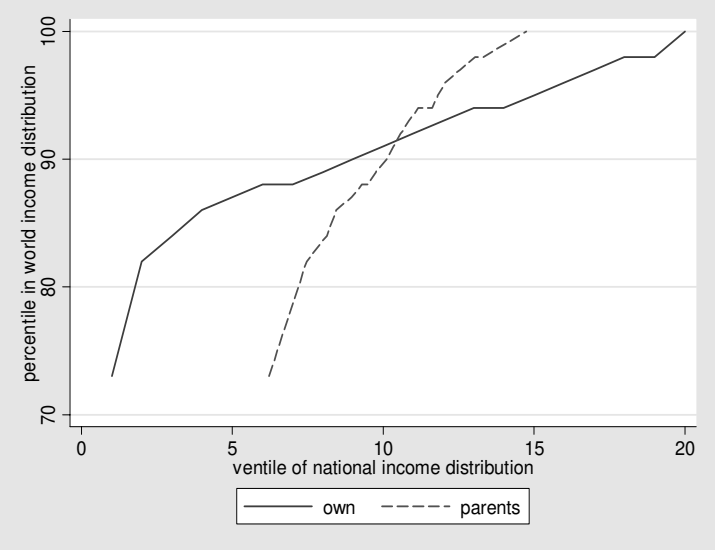
where C_{ij}^* = expected social class of *i*-th individual's parents. This is calculated as the mean of the conditional distribution of parents' ventile positions.[28] C_{ij}^* is the same for all individuals (children) belonging to a given ventile (and the same country), *i*.e., the expected position of their parents is the same. This brings us a bit closer to isolating the effect of circumstance (since it introduces inter-ventile variability of parents' position) but still misses a part due to individual effort because all individuals in a given social class who might have had, and are likely to have had, parents from different social classes (see Figure 3) are assigned the same *expected* parents' social class. The averaging accordingly compresses the variability of outcome that is due to individual effort. In columns (4)-(6) of Table 4, we show the results for the three scenarios delineated above, the base case, optimistic and pessimistic.

[28] That is, the means of the distributions such as shown in Figure 2.

Comparing regressions (3) and (4), we note that the substitution of own ventile position by parents' ventile position leaves broadly unchanged the total "explained" variability of income position in the world. Parents' social class is not only statistically significant but in the absolute value greater than own social class: on average, having parents' ventile position go up by one notch increases one's position in the world by 6.3 percentage points. The reason why the coefficient on parents' social position is larger than on own position is easily explained if we consider that the effect of a positive ρ is that it "shrinks" the distribution of parents' ventiles compared to the current (observed) distribution.[29] In conditions of social mobility, however slight, people currently in the bottom social class have parents whose estimated social class is higher than the bottom (for otherwise there would be no mobility); people in the top social class, would likewise have parents whose expected social position is closer to the middle etc. This is illustrated in Figure 4 on the example of Germany. The "shrinkage" of parents' expected social class compared to the children's' produces a steeper line, as shown by the broken line in Figure 4, and thus each one-point increase in parents' social class will have a greater absolute effect on one's position in the world than one own similar one-step increase. Notice that in the extreme example of almost full mobility (with $\rho \rightarrow 0$), the broken line in Figure 4 would tend to become a straight vertical line starting at x=10, and then even the slightest increase in parents' social class would have dramatic (positive) impact on one's own position in world income distribution.

[29] Only if ρ were negative, would it lead to the "widening" of the spread of parents' (compared to children's) social class. On the contrary, every $\rho>0$ shrinks the distribution.

Figure 4. One's position in the world, own social class, and parents' social class (Germany 2002)



The importance of circumstance decreases noticeably however in the optimistic scenario (see regression 5 in Table 4) when we assume relatively high (although uneven) social mobility in all parts of the world. Circumstances (country of citizenship and parents' social class) explain now 72 percent of total variability in income position. With a pessimistic scenario of very low social mobility, the role of circumstances increases to 94 percent again (regression 6 in Table 4).

In conclusion, between 60 and more than 90 percent of variability in global income position can be explained by circumstances beyond individual control. Sixty percent represents the lower bound where only mean income of the country of citizenship and country's inequality are allowed to play a role. Ninety percent or more is obtained when we include person's parental income as part of circumstance, and use different assumptions regarding social mobility in various parts of the world. However, for the reasons explained above (assignment of the same parental ventile to all people within the current social class), ninety percent represents an overestimate of the role of circumstance. A value of around 70 percent which we get using the optimistic

assumptions regarding social mobility seems a reasonable median estimate. In any case, the part which remains for effort and "episodic luck" (to use John Roemer's felicitous phrase) must be quite small. The results illustrate the limitations of one's own effort in effecting an improvement in one's position in world income distribution.

Table 4. Explaining one's position in the world income distribution
(dependent variable: percentile in world income distribution)

	Country only		Country and social class	Including parent's social class			Hypothetical
				Base	Optimistic	Pessimistic	
	1	2	3	4	5	6	7
Mean per capita income (in ln)	22.92 (0)	22.32 (0)	22.32 (0)	22.01 (0)	22.32 (0)	22.32 (0)	---
Gini index (in %)		-0.33 (0)	-0.33 (0)	-0.33 (0)	-0.33 (0)	-0.33 (0)	-0.14 (0)
Social class (ventile)			2.80 (0)				4.77 (0)
Parents' social class (ventile)				6.30 (0)	17.47 (0)	5.40 (0)	
Constant term	-126.2 (0)	-108.2 (0)	-137.6 (0)	-171.9 (0)	-291.7 (0)	-164.9 (0)	23.08 (0)
Number of observations	2300	2300	2300	2300	2300	2300	2300
R^2 adjusted	0.60	0.61	0.91	0.93	0.72	0.94	0.96
F value	4254 (0)	1799 (0)	1202 (0)	1231 (0)	1199 (0)	1509 (0)	3353 (0)

Note: The regressions are run with the cluster option to adjust for correlation of within-country observations. Regressions are unweighted. There are 115 countries times 20 ventiles = 2300 observations. *p* values between brackets. Social class ranges from 1 (lowest) to 20 (highest).

Let us now compare this actual role of location to a hypothetical situation where all countries' mean incomes are equal.[30] We still "allocate" people to different countries and social classes in our Rawlsian lottery, but now location implies only a difference in income distributions between the countries (different Ginis), not the difference in average

[30] This is the situation referred by Roemer (2007) as Equality of opportunity of degree 1. Incidentally, if all mean incomes were equalized the global Gini would be only 37.4 vs. the actual Gini of 64.2 (based on World Income Distribution 2002 dataset).

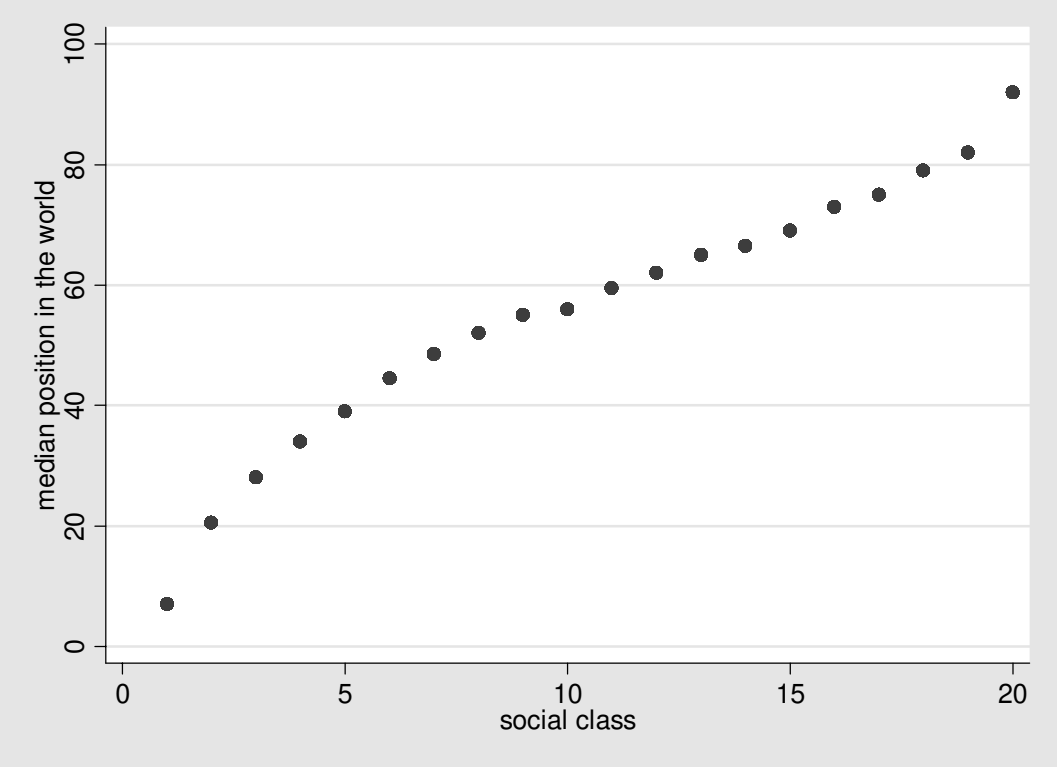
wealth. The results are shown in column (7). The coefficient on social class more than doubles compared to regression (3), and when we decompose the two effects, social class is found to explain more than 90 percent of variability in global income position, while location (through its specific inequality) accounts for less than 5 percent. [31] The counterfactual allows us to conclude that location really matters through its mean income effect, not through its specific (national) inequality.

[31] Historically, something similar might have obtained in the early 19th century when, according to the Bourguignon and Morrisson (2002) study of long-run global inequality, class (within-national inequality) explained about 90 percent of overall world inequality.

Median global position and its variability when social class is given

After this flight of fancy, let us return to the world as it is. A different way to look at effort is to consider by how much one's position in the world improves if he or she is able to move up the ladder within his/her country. For example, for a person in the bottom social class, the median position in the world is the 7th percentile. Suppose now that he manages to climb up to the 5th social class. His median position will have improved to the 39th percentile. Another equivalent climb of five social classes up the ladder will place him in the 56th percentile. Figure 5 shows the results for each of the twenty social classes. The marginal gains are very significant at the bottom (e.g., the move from the lowest the second social class improves one's median position by 14 percentiles), then taper off in the middle, and increase again at the very top: going from the 19th to the highest social class improves one's median position by ten percentiles (from 82 to 92).

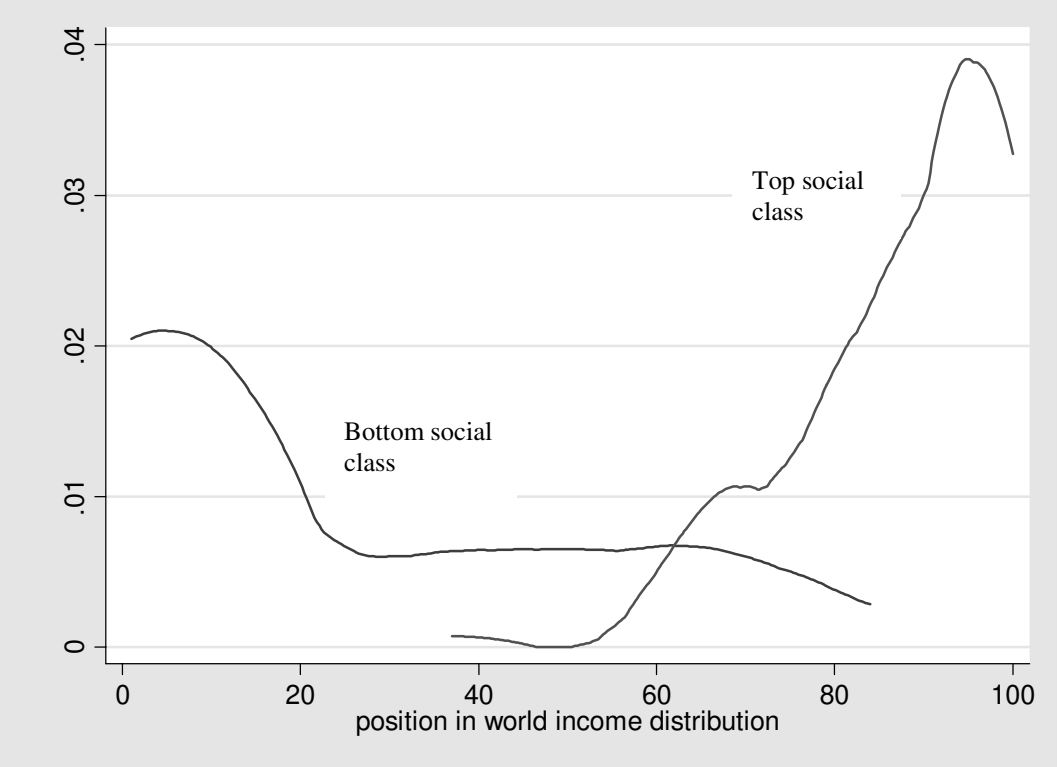
Figure 5. Median position in the world as function of social class



Note: unweighted data, each country's ventile represents one observation.

So far we have considered only the median position of a person if his national social class is given. What is important to take into account also is that the variability of one's position in world income distribution is not the same regardless of social class. In other words, the *distribution* of positions for various social classes is different. Figure 6 illustrates this for the two extremes, the top and bottom social classes. The distributions are of different shapes, in addition to covering obviously different parts of the global income distribution. The overlap between the two distributions is small but the very fact that it exists illustrates how unequal national mean incomes must be because in some cases people belonging to the top national social class are worse off than people who are in the bottom social class of another country. If one belongs to the lowest social class, he is very likely (probability of more than 60 percent) to be placed in the bottom quintile of world income distribution. But he can, at the extreme, if he lives in a rich country, rank as high as the 84^{th} world percentile (this is the case if he lives in Luxembourg). On the other hand, if he belongs to the highest national social class, his range of possible outcomes, although wide, is narrower than in the previous case: in the worst case scenario (if he lives in Tanzania), his position in the world would be in the 37^{th} percentile while in the vast majority of cases he would be placed above the 90^{th} percentile.

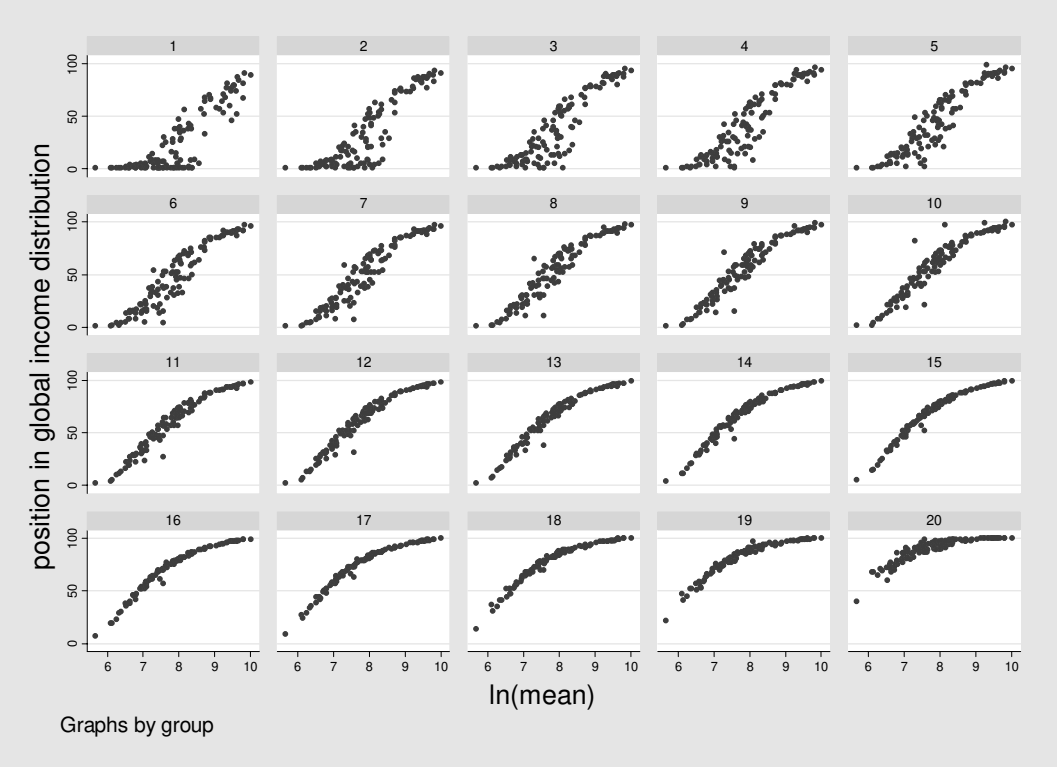
Figure 6. Density function of one's position in the world as function of one's social class



Note: Unweighted data, each country's ventile represents one observation.

A slightly different, and a more complete, way to look at this is shown in Figure 7. There we plot percentile ranks in the global income distribution for each social class against mean country income. The upward sloping curves show that, for any given social class, the increase in mean country income is associated with higher position of that social class in the global income distribution. The relationship is sharper as we move from low to high social classes. This means that the variability of outcomes, due to national idiosyncratic factors, will be greater among the nationally poor than among the nationally rich.

Figure 7. Social class, country mean income and position in global income distribution



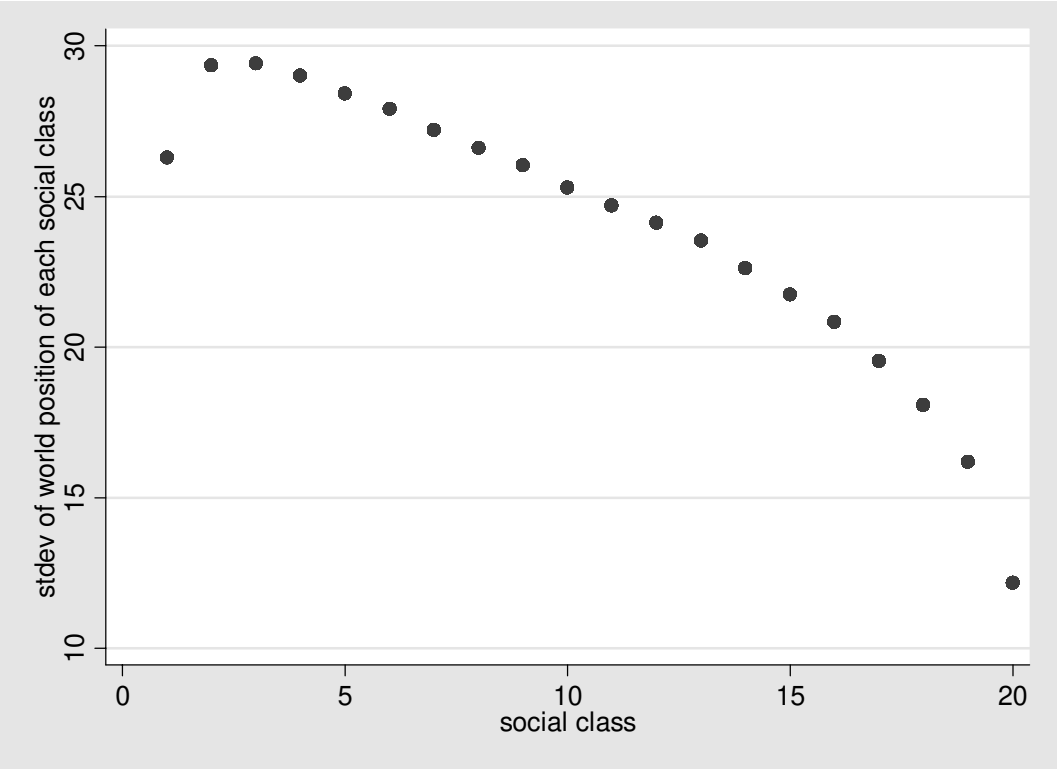
Note: Each graph for one social class, running from 1 to 20.

In effect, the variability of positional outcomes, measured by the standard deviation, steadily decreases (with one exception) as social class goes up (see Figure 8). For low social classes (below the fifth), the standard deviation is about 30 percentiles; for the top social classes, the standard deviation is less than 20 percentiles. A significant exception to this regularity is the lowest social class whose variability of position is less than that of the second, third and the few following classes.

To summarize: if one is in the top social class of his country, the median position in the world that he can expect to attain is the 92nd percentile and the standard deviation is only about 12 percentiles. If he belongs to the bottom social class in his country, his median position in the world is the 7th percentile but the standard deviation is much larger: about 26 percentiles. In other words, for those who belong to low social classes

("nationally poor"), location matters even more than to those who are "nationally rich". To this issue we turn next.

Figure 8. Standard deviation of one's position in world income distribution as function of one's social class



5. Varying importance of location for different social classes

If social class is given, how well can we predict global position with knowledge of country income alone?

When people are allocated a social class in our Rawlsian lottery, it is not a matter of indifference, as we have seen, what country they get allocated to. Location, if one "draws" a rich country, can more than compensate for a "wrong" social class. But the impact of location is not uniform at all social class levels. When a person is allocated a country, he is also allocated two relevant features of that country: its mean income, and its income distribution. Table 5 shows the results of regressions similar to (1) but with social class being held constant. That is, for each social class, we regress person's position in world income distribution on country's characteristics alone, its mean income and a measure of its inequality (the ventile's share of total income). These two characteristics always explain more than 90 percent of variability in person's position (with social class given). For example, looking at the people in the lowest social class, the R^2 is about 0.9, and each 10 percent increase in mean country income is worth 2.3 percentiles climb in the global income distribution. But for a person belonging to the top social class, each 10 percent increase in mean country income is worth only 1.2 percentiles increase in the global income distribution. We find again that location matters more to nationally poor than to nationally rich people.

Trade-off between country's mean income and country's distribution across social classes

The two country characteristics (mean income and its inequality, expressed as a ventile share) can also be seen as substitutes: given his social class, a person might prefer to be "allocated" into a more equal society even if its mean income is less. He could benefit more (if he is poor) by the first than lose by the second. Intuitively, we can also see that if a person is allocated to a top income class, then the gain from belonging to a more equal society will be negative. Thus, the trade-off between mean income and inequality is not the same across social classes. Going back to our example of the bottom social class, we see that each point increase in the bottom group's ventile share is worth a

(huge) climb of 23 percentage points in world income position (see regression 1 in Table 5). Now, to achieve the same increase of 23 points in the global position, a person would need to be located in a country twice as rich. This is the shape of the trade-off for those in the lowest social class. Contrast this with the fact that if the ventile share of the people in the richest social class goes up by 1 percentage point their position in the world will improve by only 0.6 percentile which is an increase equivalent to living in a country that is only 5 percent richer (regression 20 in Table 5).

Table 5. Explaining a person's position in world income distribution—given his national social class (ventile)

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Mean country income	23.49 (0)	24.98 (0)	25.33 (0)	25.36 (0)	25.34 (0)	25.31 (0)	25.03 (0)	24.83 (0)	24.47 (0)	24.01 (0)	23.62 (0)	23.16 (0)	22.69 (0)	21.89 (0)	21.07 (0)	20.12 (0)	18.96 (0)	17.67 (0)	15.84 (0)	11.74 (0)
Ventile share (in %)	23.10 (0)	20.29 (0)	17.85 (0)	15.62 (0)	13.36 (0)	11.36 (0)	9.51 (0)	8.02 (0)	6.74 (0)	5.68 (0)	4.63 (0)	3.77 (0)	3.11 (0.01)	2.45 (0.04)	2.07 (0.04)	2.51 (0.01)	3.09 (0)	3.10 (0)	1.47 (0)	0.61 (0)
Constant	-186.3 (0)	-197.2 (0)	-197.3 (0)	-194.0 (0)	-189.2 (0)	-184.2 (0)	-177 (0)	-170.7 (0)	-163.3 (0)	-155.6 (0)	-147.9 (0)	-140.2 (0)	-132.7 (0)	-122.1 (0)	-112.5 (0)	-106.4 (0)	-100.8 (0)	-91.3 (0)	-62.4 (0)	-17.9 (0.01)
Adj. R^2	0.906	0.953	0.963	0.967	0.969	0.967	0.965	0.964	0.961	0.959	0.957	0.953	0.951	0.947	0.944	0.940	0.938	0.937	0.931	0.902
No of obs	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
F value	372.9 (0)	776 (0)	994 (0)	1086 (0)	1203 (0)	1239 (0)	1154 (0)	1146 (0)	1019 (0)	914 (0)	820.5 (0)	697.8 (0)	590.8 (0)	534.9 (0)	466.9 (0)	436.8 (0)	374.6 (0)	302.6 (0)	254.1 (0)	152.4 (0)

Note: Ventile share expressed in percent of total country income. Mean per capita income in $PPP per annum. *p*-values between brackets

However, the reasonable trade-off has to allow that the increase of 1 percentage point in the ventile share is in relative terms much greater (and much less likely to obtain) for the poor people than for the top income class. For the poor, such an increase would mean a doubling of their share, for the richest, an increase of less than 1/20 (see Table 6). To normalize for this and make the analysis more realistic, we consider a trade-off where a person is, in each case (that is, *given* the social class he or she belongs), placed in a country whose ventile share is one standard deviation above the average. This means that for the poorest social group, his positional gain would be 0.52 percentage points, for the richest group 7.35 points (see Table 6). Now, the relative "worth" of national income distribution thus defined is contrasted to the "worth" of higher mean country income. The results are shown in Figure 9. The importance of national distribution is, as expected, very high for the poor: "getting" a country whose bottom class's share is one standard deviation above the mean is equivalent to "drawing" a country that is 50 percent richer. The trade-off then gradually weakens before picking up for the richest three social groups. There too "drawing" a (very unequal) country such that, for example, the highest social class has a ventile share that is one standard deviation higher than the mean ventile share of that social class, is equivalent to living in a 40 percent richer country. We therefore have to modify our earlier conclusion: for both the people who are "assigned" to be nationally poor and nationally rich, "drawing" respectively more equal or more unequal country will matter a lot. [32]

[32] These results can be represented in the form of "iso-positional" lines with mean income on one axis, and social class on another axis.

Table 6. Share of total income received by each ventile of national income distributions

Ventile	Average ventile share in total income (in %)	Standard deviation of ventile share (in %)
First	1.00	0.52
Second	1.50	0.60
Third	1.80	0.63
Fourth	2.06	0.64
Fifth	2.31	0.65
Sixth	2.54	0.65
Seventh	2.78	0.64
Eighth	3.02	0.63
Ninth	3.28	0.62
Tenth	3.55	0.60
Eleventh	3.85	0.58
Twelfth	4.18	0.56
13^{th}	4.55	0.53
14^{th}	4.99	0.48
15^{th}	5.52	0.45
16^{th}	6.18	0.41
17^{th}	7.07	0.48
18^{th}	8.36	0.75
19^{th}	10.72	2.01
Twentieth (top)	20.74	7.35
Total	100	

Note: Calculated from 110 countries' household survey distributions for the benchmark year 2002. Unweighted averages. Source: WYD database.

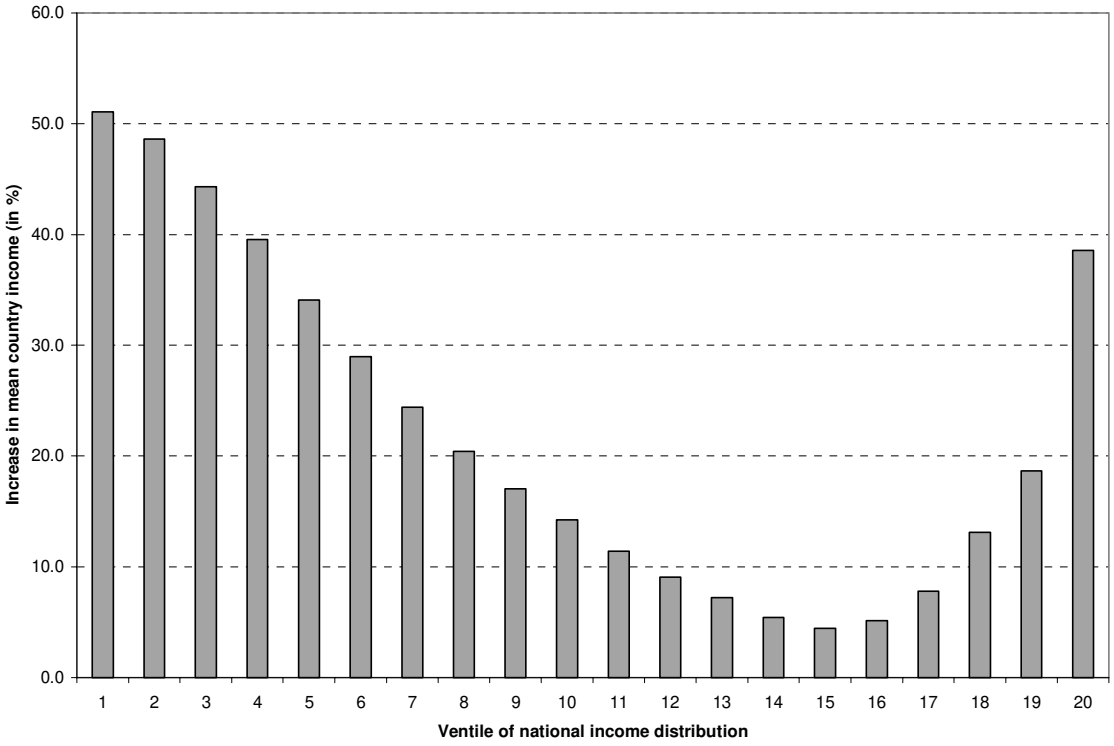
The results have implications for migration. If low social class people migrate to richer countries, and expect that they would end up there too among low social classes, then equality of the receiving country's income distribution must be quite important for them. A very large increase indeed in mean country income is needed to offset this "distributional premium". But differently, if nationally rich people (say, highly skilled) migrate from a poor to a rich country, and expect to be among high income groups in their new country too, then they might prefer to select highly unequal societies, even if their mean income is less than the mean income of an alternative migration destination. [33]

[33] An interesting example is provided by Bustillo (2007, pp. 21-22). His results show that the percentage of immigrants monotonically decreases as one moves from poorer to richer deciles in Spain. But in the United States, the share of immigrants charts an inverted U curve: it is very large in the bottom and top deciles.

Given mean income of the recipient country, and given expectations on where one might be placed in the social structure of the new country, we would expect low-skilled people to migrate into more equal countries and more skilled people to migrate into more unequal countries. This parallels the idea underlying Borjas's (1987, 1999) self-selection hypothesis. However, note that the picture here is a bit more complex, in the sense that while the increase in mean income has to be high at both ends of income distribution to compensate for either unequal income distribution (for the poor) or equal income distribution (for the rich), the offsetting increase in mean country income is rather minimal for middle income groups (see, for examples, ventiles 11 through 18 in Figure 9). It means that for the middle classes, the distribution in the receiving country will not matter much: country's mean income will be much more important.[34] In turn, this result implies that for most people with moderate skill levels, or with people with high skill levels who do not expect to be able to make it to the top of the income ladder in the receiving country, it will be mean income of the receiving country that would trump other considerations.

[34] The finding parallel Palma's (2006) recent emphasis on broad share constancy of middle deciles regardless of how equal or unequal the overall distribution is. In other words, inequality of distributions is determined by high or low shares of the top or bottom fractiles, not by the shares of the middle groups.

Figure 9. Value of one standard deviation increase in the ventile share at different points of national income distribution (measured in terms of mean country income)



Note: Calculated from Tables 5 and 6.

6. Conclusions

This paper allows us to make three key conclusions.

First, with only two characteristics, person's location (which in a world with no significant migration, essentially means his place of birth), and social class (which also could be determined by birth), we are able to account for more than 90 percent of his/her position in global income distribution. The first characteristic (location) is clearly a "circumstance", or a morally inconsequential, feature. It explains 60 percent of one's position in global income distribution. The second characteristic, to the extent that social mobility is not absolute, also has a share of "circumstance" rather than "effort" in it. We estimate that between 1/3 and 2/3 of the social class effect is due to circumstance. Recalling other obvious circumstances (like gender) which are not included in the analysis, it is very unlikely than more than $1/5^{th}$ of one's position in global income distribution can be ascribed to one's effort. Global equality of opportunity is rather minimal; perhaps, a distant dream.

Second, this ability to "predict" very well one's location in global income distribution from only two characteristics, holds, not only in the aggregate, but for each social class separately. Thus, for any given social class, the knowledge of the country where a person lives is sufficient to "explain" 90 percent or more of that person's global income position. The predictive power of country mean income is strong, not only in the aggregate, but for each social class. Living in a richer country is particularly important for low social classes, where each 10 percent increase in country's mean income, lifts person's global income rank by 2.3 percentiles on average. The "location premium" is significant but less for the top income groups where it amounts to between 1 and 1.5 percentiles. In other words, the "average worth" of living in a richer country is shown to hold for the entire national income distributions, but to be particularly strong for the "nationally" poor.

Third, given a person' social class, there is also the trade-off between wealth of the country (reflected in its mean income) and its income distribution. Thus, a person

who is allocated a low social class might prefer to be allocated to a more egalitarian country even if that country's mean income is less. The opposite, of course, holds for a person allocated to a high social class: he might benefit from country's inegalitarian distribution more than from its high mean income. The trade-off is such that being placed in a country that is one standard deviation more *egalitarian* than the average is equivalent, for a person belonging to the lowest social class, to living in a 50 percent richer country. For a person who belongs to the highest social class, getting a one standard deviation more *inegalitarian* country is equivalent to living in a 40 percent richer country. But these sharp trade-offs between internal income distribution of a country and its mean income hold mostly for the extreme social classes. For the middle classes, distribution is relatively unimportant—mostly because income shares of these middle groups do not vary much across nations. Thus, for the middle ventiles, "drawing" a one standard deviation more egalitarian country can be compensated by a small increase in mean country income of less than 10 percent (or even less than 5 percent in some cases). Consequently, for the people in the middle, wealth of the country, measured by its mean income, will be of paramount importance.

The last point has clear implications for migration. If people who migrate expect to be placed in the middle of the national income distribution of the receiving country, they will be focused primarily on country's mean income. But if people who migrate expect to end up in the bottom of the recipient country's income distribution, whether the recipient country is egalitarian will be of significant importance in their decision-making. And the reverse if they expect to end up in the top of income distribution of the recipient country.

REFERENCES

Berry Albert and John Serieux (2097), "World economic growth and income distribution, 1980-2000" in *Flat World, Big Gaps* (2007), edited by K.S. Jomo and Jacques Baudot, Hyderabad, India, London; UK and New York, US; Penang, Malaysia: Orient Longman, Zed Press and Third World Network, pp. 1-23.

Blanden, Joe, Paul Gregg and Stephen Machin (2005), "International mobility in Europe and North America", Centre for Economic Performance, London, April.

Borjas George J. (1987), "Self-selection and the earnings of immigrants", *American Economic Review,* vol. 77, pp. 531-553.

Borjas, G. J. (1999). "The economic analysis of immigration", in O. Ashenfelter and D. Card (Eds.), *Handbook of Labor Economics,* vol. 3A, Chapter 28, pp. 1697-1760. Elsevier Science North Holland.

Bustillo, Rafael Munoz de (2007), "Migration and inequality: What do we know?", Provisional draft, May 2007.

Bourguignon, Francois and Christian Morrisson (2002), "The size distribution of income among world citizens, 1820-1990", *American Economic Review*, September, pp. 727-744.

Bjorklund, Anders and Markus Jantti (1997), "Intergenerational income mobility in Sweden compared to the United States", *American Economic Review*, vol. 87, No. 5, pp. 1009-1018.

Checcci, D., A. Ichino and A. Rustichini (1999), "More equal but less mobile? Education financing and intergenerational mobility in Italy and in the US", *Journal of Public Economics*, vol. 74, No. 3, pp. 351-394.

Davies, James B., Jie Zhang and Jinli Zeng (2005), "Intergenerational mobility under private vs. public education", *Scandinavian Journal of Economics*, vol. 107, No. 3, pp. 399-417.

Jackson, Ben and Paul Segal (2004), "Why inequality matters", A Catalyst working paper, Catalyst: London, UK.

Kopczuk, Wojciech, Joel Slemrod and Shlomo Yitzhaki (2005), "The limitations of decentralized world redistribution: An optimal taxation approach", *European Economic Review*, vol. 29, pp. 1051-1079.

Lam, David and Robert Schoeni (1993), "Effects of family background on earnings and returns to schooling: Evidence from Brazil", *Journal of Political Economy*, vol. 110, pp. 710-740.

Li, H., L. Squire and Heng-fou. Zou (1998), "Explaining international and intertemporal variations in income inequality," *The Economic Journal*, 108, 26-43.

Milanovic, Branko (2002), "True world income distribution, 1988 and 1993: First calculations based on household surveys alone", *Economic Journal*, vol. 112, No. 476, January, pp. 51-92.

Milanovic, Branko (2005), *Worlds Apart: Global and International Inequality 1950-2000*, Princeton University Press.

Milanovic, Branko (2006), "Ethical and economic case for global transfers", mimeo, October, forthcoming in *Ethics and International Affairs*.

Nagel, Thomas (2005), "The problem of global justice", *Philosophy and Public Affairs*, vol. 35, No. 2, pp. 113-147.

Palma, Jose Gabriel (2006), "Globalizing inequality: "centrifugal" and "centripetal" forces at work", United Nations DESA Working paper No. 35, September 2006.

Pogge, Thomas (1994), "An Egalitarian Law of Peoples", *Philosophy and Public Affairs*, vol. 23, No. 3 (Summer), pp. 195-224.

Rawls, John (1971), *A theory of justice*, Cambridge, Mass.: Harvard University Press. Revised edition published in 1999.

Rawls, John (1999), *The law of peoples*, Cambridge, Mass.: Harvard University Press.

Roemer, John E. (1998), *Equality of opportunity,* Harvard University Press.

Roemer, John E. (2007), "What portion of global income inequality is due to country of residence", mimeo. February 5,. 2007.

Solon, G, (1999), "Intergenerational mobility in the labor market", in O. Ashenfelter and D. Card (eds.), *Industrial concentration and economic inequality: Essays in honor of Peter Hart*, Edward Elgar, Aldershot, pp. 3-21.

Sutcliffe, Bob (2003), "World Inequality and Globalization", *Oxford Review of Economic Policy*, vol. 20, No. 1, pp. 15-37.

ANNEX: Some country comparisons

Spans between the highest and lowest social classes

Table A1 shows the countries with the greatest and smallest position spans, where span is defined as the difference between the position of the richest and the poorest social class (ventile). Colombia and Brazil have the greatest span since the top ventile in both countries belongs to the 99th world percentile, and the bottom ventile belongs to the world's poorest. All other countries with the highest difference between the rich and the poor—equal or more than 95 percentage points—are in Latin America with the exception of Kampuchea. All these countries have Ginis above 50. People in these countries (with the exception of Kampuchea) are, on average, located between the 50th and 60th percentile in the world. The interpretation of this calculation (shown in column 3) is as follows: if we take a random person in (say) Colombia, his/her position in global income distribution would be at the 56th percentile. The person with the mean income of country is often ranked 20 or 30 percentage points higher (see column 4). [35]

At the other end, the countries with the smallest positional difference between the rich and the poor are all in North West Europe. Their Ginis are relatively low, ranging between 24 and 30. Now, the relationship between the position span and Gini is, as expected, positive (the linear correlation coefficient is 0.79), but the two are not exactly the same thing. To see this, imagine a very rich country, say by far the richest in the world, which would have large income differences within it (and hence a high Gini) although all its citizens, including the poorest, would be positioned highly in global income distribution. The span would be small even if inequality is high.

[35] The first measure, shown in column (3) of Table A1, represents the average position of all people in a country (thus each individual is weighted equally). The second measure, shown in column (4), is the position in world income distribution of a person with the mean income of the country. Since income distributions are skewed to the right, the second value will be always higher.

Table A1. Position span and national Gini coefficient

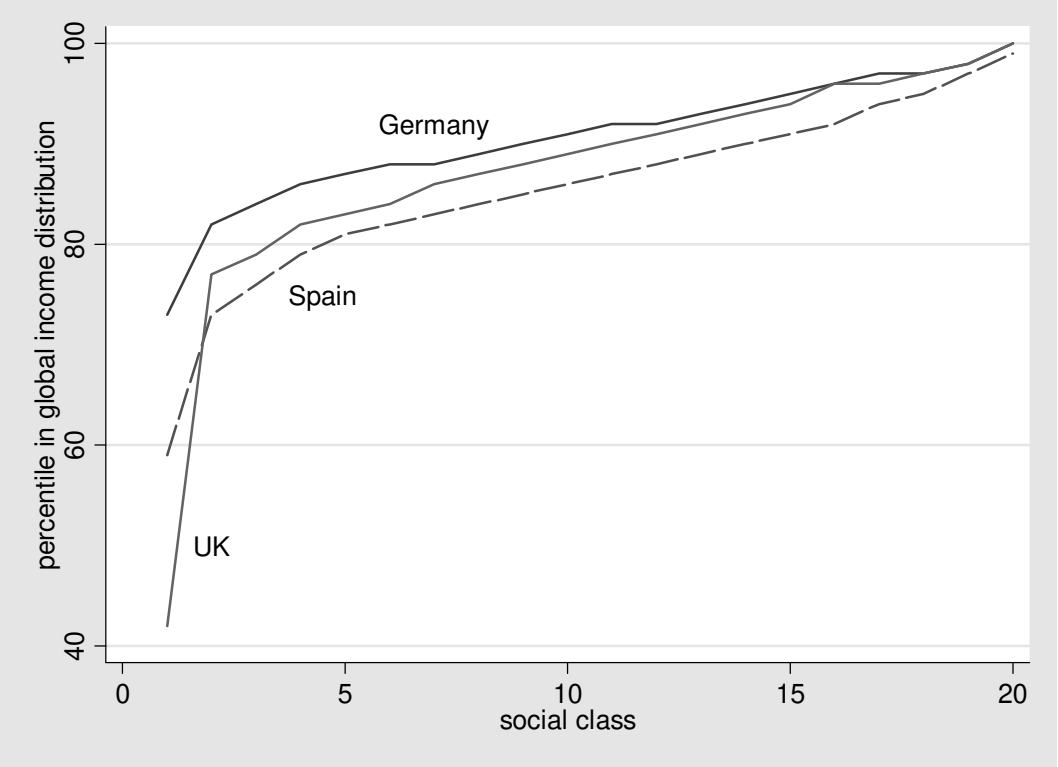
	(1) Position span	(2) National Gini	(3) Average position (rank) of individuals	(4) Position (rank) of the person with country's mean income
Countries with the largest position span (>=95)				
Colombia	98	58.7	56.2	76
Brazil	98	59.0	58.5	77
Kampuchea	97	73.0	29.6	60
Paraguay	96	54.4	55.8	73
Nicaragua	96	59.0	46.9	67
Panama	95	56.1	51.8	71
Countries with the smallest position span (<25)				
Luxembourg	16	30.1	95.2	98
Denmark	21	23.9	92.2	94
Norway	21	27.4	92.8	95
Finland	23	26.7	89.3	91
Switzerland	24	33.0	92.8	96
Other selected countries				
USA	38	39.9	91.0	96
United Kingdom	57	37.4	87.2	93
Russia	64	36.9	64.3	71
Nigeria	65	41.8	16.6	19
India	66	27.9	28.2	34
Indonesia	70	34.3	33.8	41
China	82	41.6	49.7	63

Note: Column (3) shows the average position in the global income distribution calculated across all individuals of a country.

Great class differences in the UK

Figure A1 shows the position curves for Germany, Spain and the UK. Although Great Britain is 30 percent richer on average than Spain (measured by household survey incomes), the position of its poorest ventile is significantly worse: it is at the 42nd world percentile as against Spain's 59th and Germany's (very high) 73th. The position span in Great Britain is the widest of all "old OECD" countries: it is 58 percentage points vs. (for example) only 27 for Germany.[36] The middle classes in Britain however are better off than the similar groups in Spain. And at the very top, Britain's ventiles have as high a position as German. Germany first-order dominates Spain.

Figure A1. Position curves for three west European nations



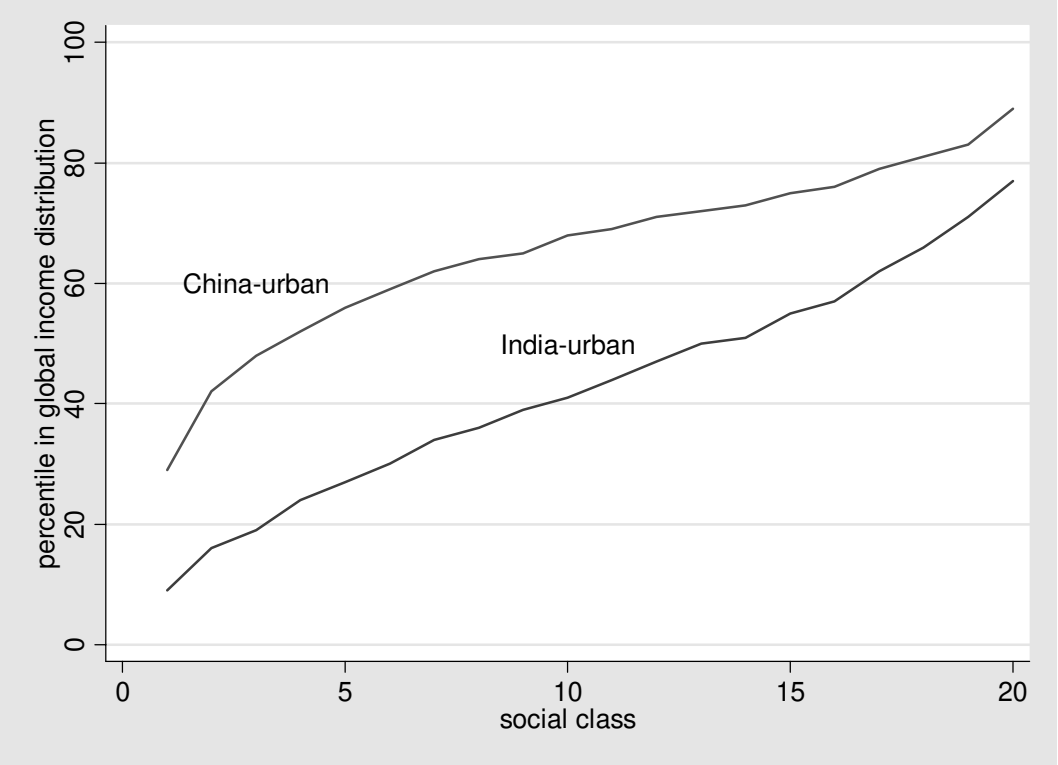
Source: WYD database for the benchmark year 2002.

[36] United States is more unequal than the UK but the position span (38 points) is less than in the United Kingdom.

China urban vs. India urban

As Figure A2 shows, China's urban population is better off throughout the entire income distribution spectrum than the urban population in India (positional first order dominance holds).[37] However while the difference is very large for the middle ventiles, it is less for the bottom and even less for the highest ventiles. The highest Chinese urban ventile's has an income that places it at the 89th percentile; for India, the equivalent ventile's position is twelve percentage points lower. The overall position spans are similar (72 percentage points in urban India, and 70 percentage points in urban China) and so are the two Gini coefficients (33).

Figure A2. Position curves for urban areas in China and India, year 2002



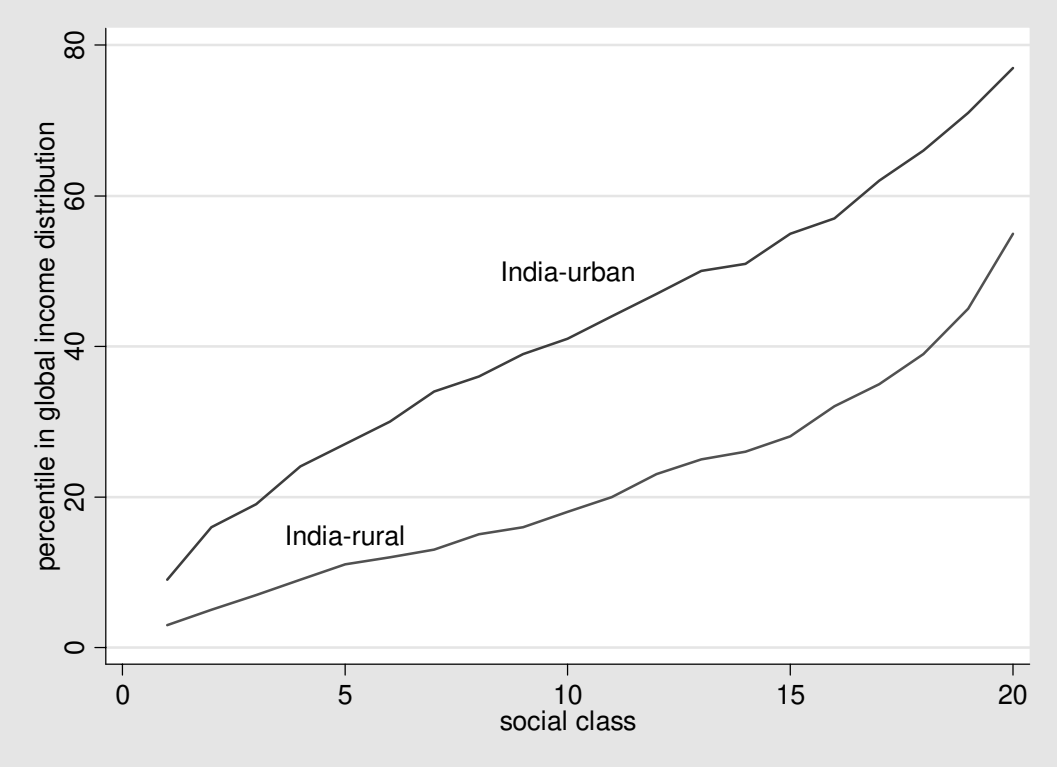
Source: WYD data for the benchmark year 2002.

[37] Mean Chinese urban per capita income is more than twice the Indian ($PPP 3,066 vs. $PPP 1,417).

Rural India vs. urban India

Figure A3 exhibits the position curves for urban and rural India. The difference between the two, for a given ventile, increases as we move from poor toward rich ventiles. The difference is small at the bottom of income distribution with the bottom rural ventile belonging to the 3rd lowest percentile in the world, and the poorest urban ventile to the 9th percentile.

Figure A3. Position curves for urban and rural areas in India, year 2002

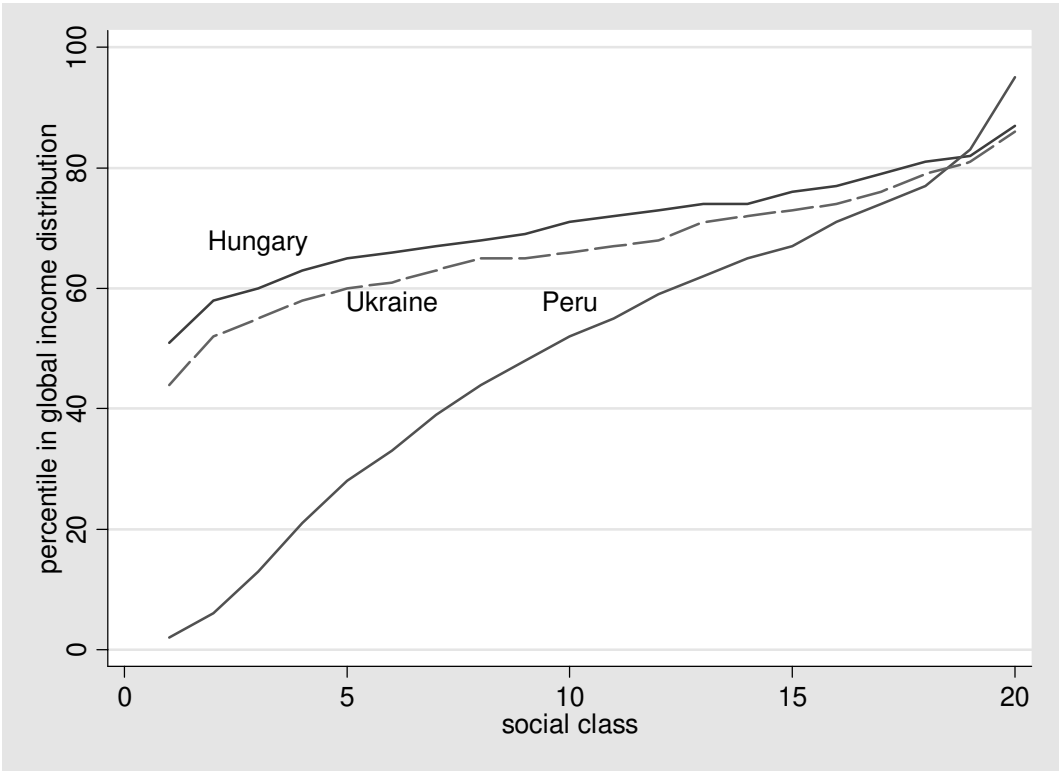


Source: WYD data for the benchmark year 2002.

Peru, Hungary, Ukraine: Similar incomes for the top, different for all others

Figure A4 shows three countries whose top ventiles have very similar incomes but where the rest of the population differs significantly. The distribution in Peru is much more unequal with all social classes but the top 20 percent having significantly lower $PPP incomes that the equivalently placed individuals in Hungary and Ukraine. The difference is the most pronounced at the bottom of the distribution. Hungary's distribution dominates the other two distributions throughout most of the range except at the top where the differences are small, and eventually negative (compared to Peru). The graph illustrates also how large differences in the welfare of the population persist between Latin America and eastern Europe despite similarities in mean incomes of the countries in the two regions. In that sense, focusing on the mean income alone gives an incomplete, and at times misleading, picture of population's true welfare.

Figure A4. Position curves for Hungary, Ukraine and Peru , year 2002

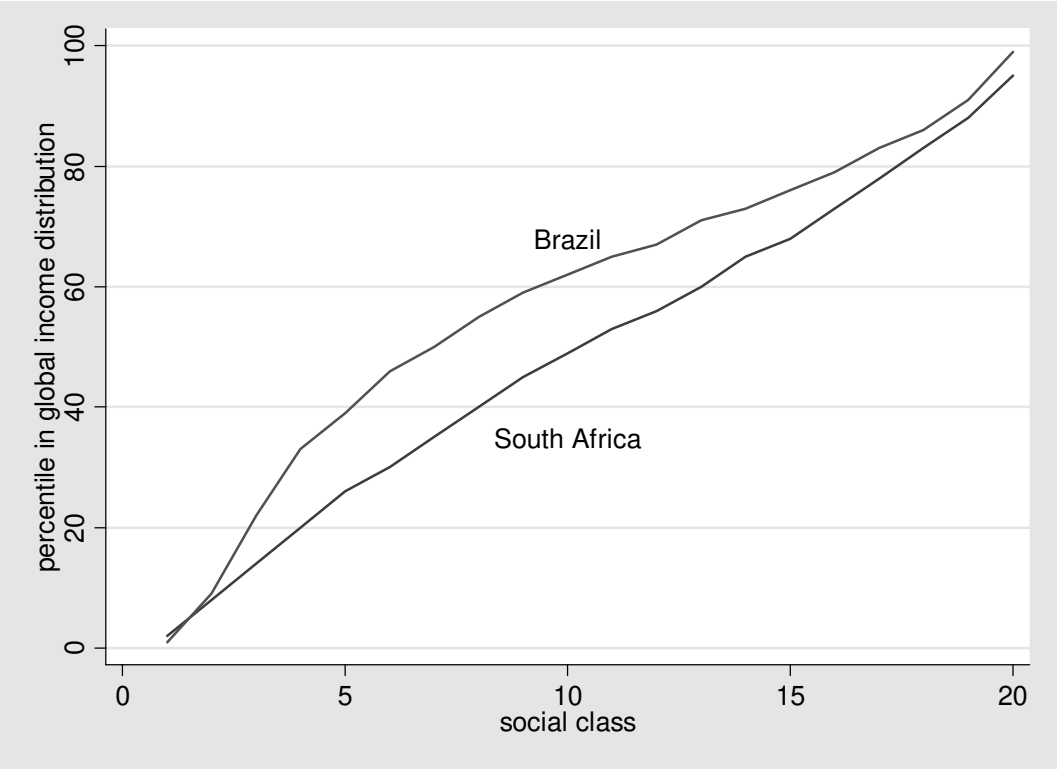


Source: WYD data for the benchmark year 2002.

Brazil vs. South Africa: two very unequal countries

Figure 5A highlights one important difference between Brazil and South Africa, whose distributions are often thought of being similar in the sense that the two countries are probably the most unequal (large) countries in the world. The position span, as we have seen before, is huge for both and even somewhat greater for Brazil than for South Africa. But one important difference revealed by looking at the position curves is the presence of a much better-off middle class in Brazil than in South Africa. People around the median of the national income distribution in Brazil are located around the 65th world percentile; the similar people in South Africa are some 15 percentage points lower in global income distribution.

Figure A5. Position curves for Brazil and South Africa, year 2002

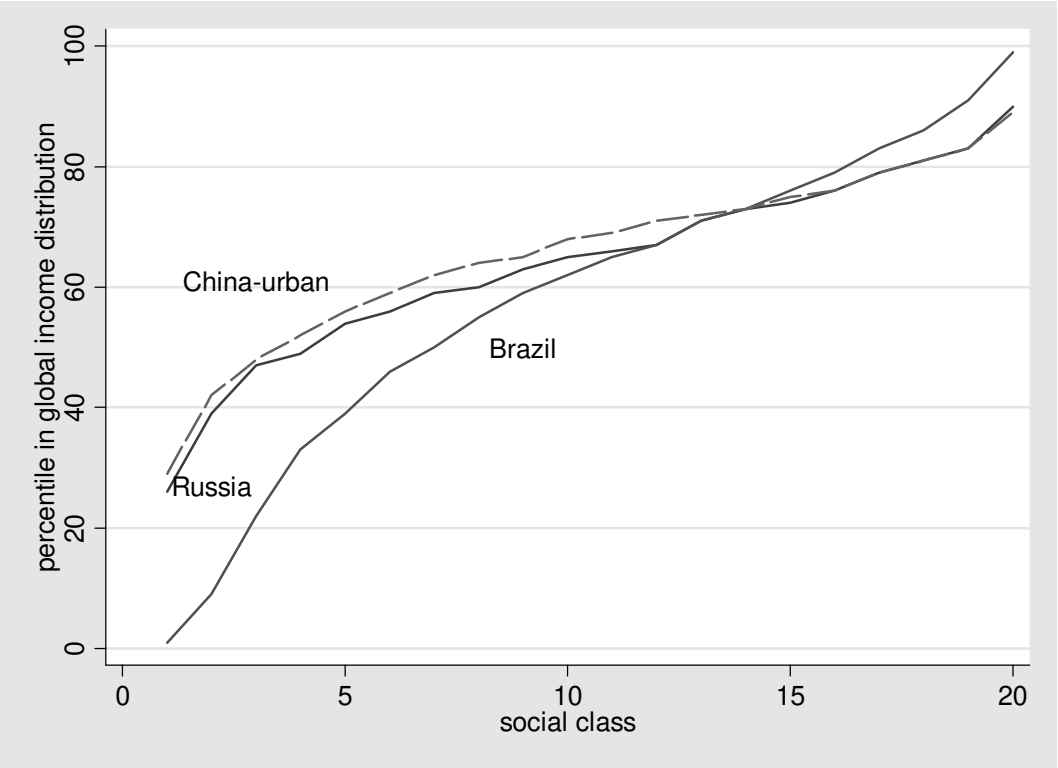


.

Russia vs. urban China

Russia and urban China display very similar distributions, both in terms of the overall positional span as well as in terms of the positions of different ventiles (see Figure 6A).[38] It is noticeable that the poor in urban China are slightly better off than the poor in Russia. The top 40 percent of income distribution are practically undistinguishable. Brazil is shown in the graph to provide a counter-point. The poor, and large segments of the lower middle class are much worse off in Brazil than in the other two countries, but the upper middle classes and top of the Brazilian income distribution are markedly richer.

Figure 6A. Position curves for Russia, urban China and Brazil, year 2002



Source: WYD database for the benchmark year 2002.

WB13527
C:\Branko\interyd\where\paper\Where2.doc
06/05/2007 3:13:00 PM

[38] Obviously, the mean incomes must be very close: around $PPP 3,100 per capita for both.