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

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Suppose that all people in the world are allocated only two characteristics: country where they live and social class. 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 explains 60 percent, and social class 30 percent of global income position. On average, “drawing” one-notch higher social class (on a twenty-class scale) is equivalent to living in a 12 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.

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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,¹ and economically-driven migration is not approved.² Thus, peoples are basically separated entities.

We shall take Rawls’s results 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.³ 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

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¹ Not having open-ended international transfers was one of key points explicitly stressed by Rawls (1999, p. 106 and p. 118).
³ See [http://www.oecd.org/dataoecd/17/39/23664717.gif](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. So, both of Rawls’ assumptions (or desiderata) seem to hold.

But we shall, for the sake of exposition, modify the Rawlsian metaphor only in so much as we shall let the global assembly be the one of all individuals in the world, and not of peoples’ representatives, and also 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 the original position, each of them is allocated two crucial characteristics that will determine his fate: county and social class within that country. 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 lack, 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 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

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4 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.

5 If there are N countries, the probability of being assigned each country is 1/N. In other words, it does not depend on country’s population.
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 increase 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: 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, \( \text{viz.} \) irrelevance of social class “assigned” at birth).\(^6\) In that sense, country assignment in our
international assembly cannot be regarded as a decision wholly separate from assignment
to a social class. This is because the assignment of citizenship will, to some extent, also
determine person’s ability to move up or down within the national social ladder.
However, for simplicity of the analysis, we may have to abstract from this element, not
the least because we have social mobility data for only a few countries in the world. 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.\(^7\) In other words, if we

\(^{6}\) But surely, we cannot think of any country where assignment to social class (at birth) is irrelevant for
one’s future prospects.

\(^{7}\) 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,
that being born poor does not “condemn” one to remain in that class). It is often thought that the US,
find people in a given social class within their nation, we shall assume that being there (largely) reflects their work effort and luck.

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?

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.

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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.

8 “...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).
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 includes mostly 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 117 household surveys representing 114 countries\(^9\) and accounting for 92 percent of world population and 99 percent of world dollar income.\(^{10}\) The geographical coverage is almost complete for all parts of the world except Africa (see Table 1).

<table>
<thead>
<tr>
<th></th>
<th>Africa</th>
<th>Asia</th>
<th>Latin America</th>
<th>E.Europe</th>
<th>WENAO</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>66</td>
<td>96</td>
<td>96</td>
<td>97</td>
<td>99</td>
<td>92</td>
</tr>
<tr>
<td>Income</td>
<td>66</td>
<td>95</td>
<td>95</td>
<td>99</td>
<td>99</td>
<td>97</td>
</tr>
<tr>
<td>Number of surveys</td>
<td>24</td>
<td>26</td>
<td>21</td>
<td>26</td>
<td>20</td>
<td>117</td>
</tr>
<tr>
<td>(countries)(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: WENAO is Western Europe, North America and Oceania (Australia and New Zealand). 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 (111 out of 117) 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 are ranked from the poorest to the richest according to their household per capita income (or expenditures, depending on what welfare aggregate is used by the surveys). Since not all countries produce annual surveys, we had to use a “benchmark” year (2002 in this case), that is, try to get the 2002 household surveys for as many

\(^9\) For China, India and Indonesia we have both rural and urban surveys.

\(^{10}\) 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. Congo, Afghanistan, Iraq, Sudan etc.) The dollar incomes however are typically available.
countries as possible, but where there were no surveys conducted in 2002, use a year as close to it as possible. In the event, 68 surveys were conducted in the benchmark year or one year before or after it, and 98 surveys within two years of the benchmark. These 98 surveys cover 5.638 million people, viz., practically all people (98.6 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).

The fact that each country is divided into 20 groups of equal size (ventiles) is extremely helpful.11 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” or “social group”. Social classes thus run from 1 to 20 with 20 being the highest. Social class determines a person’s position in national income distribution.

Social class and country of residence pin down a person’s position in global income distribution.12 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

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11 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.

12 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.”
“position in the world.” Since we divided the world into one hundred percentiles according to 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 1 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 79th percentile of world income distribution. All others 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 21 percentiles, in China, the distribution covers a much wider range from the third to the 89th 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 3rd poorest percentile of the world and the richest ventile to the 76th.13 This last position shows that 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 distribution, 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.

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13 India’s span is less than China’s.
The graph can also be read as a type of the generalized Lorenz curve where instead of income levels on the vertical axis, we have income position in the world. The advantage of this “positional” approach is that it reduces the measurement error, 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. From Figure 1 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). 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 79th world percentile, in the other four countries, the poorest ventiles are at the very bottom of global income distribution.

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14 Household surveys do not measure income or expenditures perfectly. They are less likely however to make such large income mistakes which may result in misplacing of individuals into “wrong” world percentiles.

15 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.

16 Notice that the first-order dominance is a less demanding requirement than the “no overlap” requirement. The latter implies the former.
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. 17 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 67 and 88 percent of global inequality is due to differences in mean incomes. Taking the Gini coefficient, which has been the most

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frequently used measure in global inequality studies, income differences between world citizens amount to 65.4 Gini points out of which 51.9 points are due to the between-country component.\(^\text{18}\)

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

<table>
<thead>
<tr>
<th></th>
<th>(1) Global inequality between individuals</th>
<th>(2) The between-country component of global inequality</th>
<th>(3) Share of (2) in (1) (in percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative mean deviation</td>
<td>0.517</td>
<td>0.454</td>
<td>87.8</td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>1.747</td>
<td>1.263</td>
<td>72.3</td>
</tr>
<tr>
<td>Standard deviation of log of incomes</td>
<td>1.242</td>
<td>0.998</td>
<td>80.4</td>
</tr>
<tr>
<td>Gini coefficient</td>
<td>0.654</td>
<td>0.519</td>
<td>79.4</td>
</tr>
<tr>
<td>Mehran measure</td>
<td>0.782</td>
<td>0.592</td>
<td>75.6</td>
</tr>
<tr>
<td>Piesch measure</td>
<td>0.590</td>
<td>0.483</td>
<td>81.9</td>
</tr>
<tr>
<td>Kakwani measure</td>
<td>0.356</td>
<td>0.276</td>
<td>77.5</td>
</tr>
<tr>
<td>Theil entropy measure</td>
<td>0.833</td>
<td>0.578</td>
<td>69.4</td>
</tr>
<tr>
<td>Theil mean log deviation</td>
<td>0.847</td>
<td>0.572</td>
<td>67.5</td>
</tr>
</tbody>
</table>

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

\(^{18}\) 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 person _i_ living in country _j_:

\[ P_i = \varphi(m_j, G_j, C_{ij}) \]  

(1)

where _P_i_ = 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_.

The results of estimation of (1) are shown in Table 3. We begin by asking how much of one’s global income position is explained by country mean income alone (regression 1). The answer is 57 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. Putting both of them in the regression however does not make much difference.

By putting together country and social class (regression 3), we are able to explain almost 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 2.3 percentage points in world distribution. Being placed in a higher social class increases

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19 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 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.

20 Each Gini point increase in inequality will, on average, lower person’s position by about 0.35 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.
one’s position by 2.9 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 60 percent
is due to the country of residence, and 30 percent to social class. 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. Both are very strong assumptions.
Thus a portion of the 30 percent initially attributed to effort has to be reclassified as
really due to circumstance. If, in addition, we allow that other “circumstances”, which we
have ignored in the analysis here, like race or gender, that could also be made part of the
Rawlsian lottery, the role of circumstance increases further. It seems very unlikely that
effort could account for more than a fifth, and quite likely as little as a tenth, in
explaining one’s rank in global income distribution.
Table 3. Explaining one’s position in the world income distribution  
(dependent variable: percentile in world income distribution) 

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mmean per capita income (in ln)</td>
<td>23.54</td>
<td>22.95</td>
<td>22.95</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(0)</td>
<td>(0)</td>
<td>(0)</td>
<td></td>
</tr>
<tr>
<td>Gini</td>
<td>-0.35</td>
<td>-0.35</td>
<td>-0.58</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0)</td>
<td>(0)</td>
<td>(0)</td>
<td></td>
</tr>
<tr>
<td>Social class</td>
<td>2.91</td>
<td>4.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0)</td>
<td>(0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>109.3</td>
<td>139.8</td>
<td>23.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0)</td>
<td>(0)</td>
<td>(0)</td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>2180</td>
<td>2180</td>
<td>2180</td>
<td>2180</td>
</tr>
<tr>
<td>R² adjusted</td>
<td>0.57</td>
<td>0.58</td>
<td>0.89</td>
<td>0.96</td>
</tr>
<tr>
<td>F value</td>
<td>2344</td>
<td>945</td>
<td>641</td>
<td>3416</td>
</tr>
<tr>
<td></td>
<td>(0)</td>
<td>(0)</td>
<td>(0)</td>
<td>(0)</td>
</tr>
</tbody>
</table>

Note: The regressions are run with the cluster option to adjust for correlation of within-country observations. Regressions are unweighted: each country’s ventile counts the same. There are 109 countries times 20 ventiles = 2180 observations. p values between brackets. Social class ranges from 1 (lowest) to 20 (highest).

But now compare this actual role of location to a hypothetical situation where all countries’ mean incomes are equal.\(^{21}\) We still “allocate” people to different countries and social classes in our Rawlsian lottery, but now location implies only a difference in income distribution between the countries, not the difference in average wealth. The results of regression such as (1) are now shown in column (4). The coefficient on social class increases by two-thirds, 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.\(^{22}\) The counterfactual allows us to conclude that location really matters through its mean income effect, not through its specific (national) inequality.

\(^{21}\) This is also the situation referred by Roemer (2007) as Equality of opportunity of degree 1.

\(^{22}\) Historically, something similar might have obtained in the early 19\(^{th}\) 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 8th percentile. Suppose now that he manages to climb up to the 5th social class. His median position will have improved to the 45th percentile. Another equivalent climb up the ladder of five social classes will place him in the 63rd percentile. Figure 2 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 to 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 seven percentiles.

![Figure 2. Median position in the world as function of social class](image)

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 3 illustrates this at the two extremes, the top and bottom social class. The distributions are of different shapes, in addition to covering obviously different parts of 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 below the 20th percentile of world income distribution. But he can, at the extreme, if he lives in a rich country, rank as high as as 89th 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 40th percentile while in the vast majority of cases he would be placed above the 90th percentile.
Figure 3. 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 4. 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.
In effect, the variability of outcomes, measured by the standard deviation, steadily decreases as social class goes up (see Figure 5). For low social classes (below the fifth), the standard deviation of the position is about 30 percentiles; for the top social class, the standard deviation is about 10 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 91st percentile and the standard deviation is only about 10 percentiles. If he belongs to the bottom social class in his country, his median position in the world is the 8th percentile but the standard deviation is about 28 percentiles. In other words, for those who belongs to low social classes ("nationally
poor”), location matters even more than to those who are “nationally rich”. To this issue we turn next.

Figure 5. Standard deviation of one’s position in world income distribution as function of one’s social class position
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 4 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 explains between 84 and 96 percent of variability in person’s position. 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 2.5 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 less than 1 percentile 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 characteristics (mean income and 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 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 24.8 percentage
points in world income position. Now, to achieve the same increase of 24.8 points in the global position, a person would need to be located in a country almost twice as rich (see regression 1 in Table 4). 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 0.54 percentiles which is an increase equivalent to living in a country that is only some 5 percent richer (regression 20 in Table 4).
Table 4. Explaining a person’s position in world income distribution—given his position in domestic income distribution (ventile)

|        | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19    | 20    |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ln(mean pc) | 25.4  | 27.05 | 27.19 | 27.27 | 27.06 | 26.9  | 26.63 | 26.25 | 25.74 | 25.12 | 24.63 | 23.9  | 23.3  | 22.3  | 21.3  | 20.0  | 18.5  | 16.87 | 14.59 | 9.73  |
| Adj. R² | 0.896 | 0.946 | 0.958 | 0.960 | 0.961 | 0.952 | 0.948 | 0.943 | 0.936 | 0.932 | 0.925 | 0.920 | 0.914 | 0.905 | 0.897 | 0.890 | 0.883 | 0.871 | 0.839 |
| F value | 467   | 9471  | 1228  | 1304  | 1348  | 1183  | 1082  | 992.4 | 902.6 | 795.3 | 743.5 | 667.8 | 622.5 | 573.5 | 516.2 | 470.8 | 438.1 | 408.3 | 366.4 | 283.5 |

Note: Ventile share expressed in percent of total country income. Mean per capita income in $PPP per capita per annum.
However, the reasonable trade-off has to allow for the that the increase of 1 percentage point in the ventile share is in relative terms 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 5). 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 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 7.3 points (see Table 5). 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 6. The importance of national distribution is, as expected, very high for the poor where “getting” a country where the 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 decreases 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, 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 unequal country matters quite a lot.
Table 5. Share of total income received by each ventile of national income distributions

<table>
<thead>
<tr>
<th>Ventile</th>
<th>Average ventile share in total income (in %)</th>
<th>Standard deviation of ventile share (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>1.0</td>
<td>0.52</td>
</tr>
<tr>
<td>Second</td>
<td>1.5</td>
<td>0.59</td>
</tr>
<tr>
<td>Third</td>
<td>1.8</td>
<td>0.62</td>
</tr>
<tr>
<td>Fourth</td>
<td>2.1</td>
<td>0.64</td>
</tr>
<tr>
<td>Fifth</td>
<td>2.3</td>
<td>0.64</td>
</tr>
<tr>
<td>Sixth</td>
<td>2.5</td>
<td>0.64</td>
</tr>
<tr>
<td>Seventh</td>
<td>2.8</td>
<td>0.64</td>
</tr>
<tr>
<td>Eighth</td>
<td>3.0</td>
<td>0.63</td>
</tr>
<tr>
<td>Ninth</td>
<td>3.3</td>
<td>0.62</td>
</tr>
<tr>
<td>Tenth</td>
<td>3.5</td>
<td>0.60</td>
</tr>
<tr>
<td>Eleventh</td>
<td>3.8</td>
<td>0.58</td>
</tr>
<tr>
<td>Twelfth</td>
<td>4.2</td>
<td>0.56</td>
</tr>
<tr>
<td>13th</td>
<td>4.5</td>
<td>0.53</td>
</tr>
<tr>
<td>14th</td>
<td>5.0</td>
<td>0.48</td>
</tr>
<tr>
<td>15th</td>
<td>5.5</td>
<td>0.45</td>
</tr>
<tr>
<td>16th</td>
<td>6.2</td>
<td>0.41</td>
</tr>
<tr>
<td>17th</td>
<td>7.1</td>
<td>0.48</td>
</tr>
<tr>
<td>18th</td>
<td>8.4</td>
<td>0.75</td>
</tr>
<tr>
<td>19th</td>
<td>10.7</td>
<td>2.00</td>
</tr>
<tr>
<td>Twentieth (top)</td>
<td>20.8</td>
<td>7.34</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: Calculated from 109 countries’ household survey distributions for the benchmark year 2002. Source: WYD database.

These 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 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.

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 to 17 in Figure 6). This 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. This, in turn, 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 immigrant country, it will be mean income of the receiving country that would trump other considerations.
Figure 6. Value of one standard deviation increase in ventile share at different points of national income distribution (measured in terms of mean country income)

Note: Calculated from Tables 4 and 5.
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. The second, to the extent that social mobility is not absolute, also has a share of “circumstance” rather than “effort” in it. It is therefore unlikely than more than 20 percent of one’s position in global income distribution can be ascribed to one’s effort. Global equality of opportunities is minimal; it is just 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 a person lives in, is sufficient to “explain” between 80 and 90 percent 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 2.5 percentiles. 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’s 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 classes do not
vary much across nations. Thus, for the middle ventiles, “drawing” a one standard
deviation more egalitarians country can be compensated by a very small increase in mean
country income of less than 10 percent. 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.
REFERENCES


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 income 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 South Africa and Sao Tome and Principe. All these countries have Ginis above 50. People in these countries (with the exception of Sao Tome and Principe) are, on average, located between the 50th and 60th percentile in the world. The person with the mean income of country is often ranked 20 or 30 percentage points higher. 23

At the other end, the countries with the smallest positional difference between the rich and the poor are all in western Europe (except for Japan). Their Ginis are relatively low, ranging between 24 and 33. Now, the relationship between the position span and Gini is, as expected, positive (the linear correlation coefficient is 0.72, the correlation of their logs 0.64) 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.

23 The first measure, shown in column (3) of Table A1, represents the mean 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. (The first measure is different than the position of a person with the median national income.)
## Table A1. Position span and national Gini coefficient

<table>
<thead>
<tr>
<th>Position span</th>
<th>National Gini</th>
<th>Average position (rank) of individuals</th>
<th>Position (rank) of the person with country’s mean income</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Position span</td>
<td>National Gini</td>
<td>Average position (rank) of individuals</td>
<td>Position (rank) of the person with country’s mean income</td>
</tr>
<tr>
<td>Countries with the largest position span (&gt;=95)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>98</td>
<td>58.7</td>
<td>59.9</td>
</tr>
<tr>
<td>Brazil</td>
<td>98</td>
<td>59.0</td>
<td>62.1</td>
</tr>
<tr>
<td>Paraguay</td>
<td>97</td>
<td>54.4</td>
<td>59.5</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>97</td>
<td>59.0</td>
<td>49.9</td>
</tr>
<tr>
<td>Panama</td>
<td>96</td>
<td>56.1</td>
<td>55.2</td>
</tr>
<tr>
<td>Peru</td>
<td>96</td>
<td>53.9</td>
<td>53.1</td>
</tr>
<tr>
<td>El Salvador</td>
<td>96</td>
<td>58.4</td>
<td>54.5</td>
</tr>
<tr>
<td>South Africa</td>
<td>95</td>
<td>57.3</td>
<td>52.7</td>
</tr>
<tr>
<td>Mexico</td>
<td>95</td>
<td>51.0</td>
<td>57.5</td>
</tr>
<tr>
<td>Sao Tome and Principe</td>
<td>95</td>
<td>55.2</td>
<td>41.4</td>
</tr>
<tr>
<td>Honduras</td>
<td>95</td>
<td>53.5</td>
<td>51.0</td>
</tr>
<tr>
<td>Countries with the smallest position span (&lt;25)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Luxembourg</td>
<td>11</td>
<td>30.1</td>
<td>96.7</td>
</tr>
<tr>
<td>Norway</td>
<td>16</td>
<td>27.4</td>
<td>94.9</td>
</tr>
<tr>
<td>Finland</td>
<td>19</td>
<td>26.7</td>
<td>92.4</td>
</tr>
<tr>
<td>Switzerland</td>
<td>19</td>
<td>33.0</td>
<td>95.0</td>
</tr>
<tr>
<td>Belgium</td>
<td>21</td>
<td>32.2</td>
<td>93.2</td>
</tr>
<tr>
<td>Germany</td>
<td>21</td>
<td>33.0</td>
<td>93.5</td>
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<tr>
<td>Sweden</td>
<td>23</td>
<td>27.3</td>
<td>92.1</td>
</tr>
<tr>
<td>Other selected countries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>33</td>
<td>39.9</td>
<td>93.4</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>54</td>
<td>37.4</td>
<td>90.4</td>
</tr>
<tr>
<td>Russia</td>
<td>66</td>
<td>36.9</td>
<td>68.7</td>
</tr>
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<td>70</td>
<td>41.8</td>
<td>17.1</td>
</tr>
<tr>
<td>India</td>
<td>73</td>
<td>32.4</td>
<td>30.1</td>
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<tr>
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<td>76</td>
<td>34.3</td>
<td>35.8</td>
</tr>
<tr>
<td>China</td>
<td>86</td>
<td>41.6</td>
<td>53.1</td>
</tr>
</tbody>
</table>

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 46th world percentile as against Spain’s 64th and Germany’s (very high) 79th. The position span in Great Britain is the widest of all “old OECD” countries: it is 60 percentage points vs. (for example) only 26 for Germany.24 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. There is no positional first order dominance among the three countries though.

Figure A1. Position curves for three west European nations

![Position curves](image)

Source: WYD database for the benchmark year 2002.

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24 United States is even more unequal but the position span (33 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). 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 in the 93rd world percentile; for India, the equivalent ventile’s position is 10 percentage points lower. The overall position span is higher in urban India (74 percentage points) than in urban China (58 percentage points), although the two Gini coefficients are equal (33).

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

Source: WYD data for the benchmark year 2002.

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 2\textsuperscript{nd} lowest percentile in the world, and the poorest urban ventile to the 8\textsuperscript{th} percentile; however the difference rises, in particular, among the middle ventiles.

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

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 70th 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 position of different ventiles (see Figure 6A).\(^{26}\) 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 between the two countries. 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.

\(^{26}\) Obviously, the mean incomes must be very close: around $PPP 3,100 per capita for both.