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## Global Estimates of Opportunity and Mobility: A new database

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*For many people, striving for equality of opportunity – a world in which each person has the chance to achieve lives of their own choosing – serves as compelling goal for society. But how do we measure this kind of (in)equality? **Francisco HG Ferreira, Paolo Brunori and Pedro Salas-Rojo** introduce a new public data repository that gives comparable estimates of inequality of opportunity for over 70 countries all around the world.*

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Have you ever asked yourself “what would a just society look like?” If you have, less inequality would almost certainly have been part of your answer. We live, after all, in a world where billionaires go on space flights at the same time as over 600 million people eke out an existence on less than two dollars a day, or thereabouts. That cannot possibly be fair.

But push yourself a little harder: what would the ideal, just society look like, if we could design it? Would everyone have to earn exactly the same income, or hold the same amount of wealth? Would everyone have to attain the same level of education? Say, everyone must go to college and, to avoid inequality, no one should earn a postgraduate degree?

Most people intuitively think not. Indeed, egalitarian philosophers who were critical of utilitarianism (the idea that total, or average, income or wellbeing is what society should aim to maximise), did not take complete income equality as the objective. Between the 1970s and the 1990s, many suggested that what should be made equal were people’s chances to achieve the lives of their own choosing. Hence John Rawls put forward the Principle of Equal Opportunities as one of two fundamental principles of social justice, while Amartya Sen focussed on the capabilities that people had to achieve lives that they valued, urging societies to make these capabilities as ample and equal as possible to all. Ronald Dworkin spoke of “equality of resources” and, more recently, Richard Arneson and Gerald Cohen insisted on “equality of opportunities”.

But if this is such an important concept, the question then becomes: can we measure it? Can we quantify it? If we cannot, how can we hope to assess a society’s distance from – or progress towards – equality of opportunity?

## How to measure inequality of opportunity

Surprisingly, it wasn't until thirty years ago that economists began to try to model and measure inequality of opportunity using household-level data.

While there were, as usual, differences in the details and nuances, one fundamental principle quickly emerged as a consensual keystone of what constitutes equality of opportunity: *that the outcomes people reach in life – incomes, education, wealth – should not depend on circumstances over which they have no control or which they cannot choose*. This obviously includes all the characteristics we inherit at birth: race, sex, ethnicity, nationality, place of birth, family background. But it could extend beyond that set of inherited circumstances, to include other random events over which we have no control: how old were we when a pandemic hit, or did we develop a disability early in life? **Inherited inequalities**, then, are a subset of inequalities of opportunity.



*A world of equal opportunities is one in which the outcomes people reach in life – incomes, education, wealth – should not depend on circumstances over which they have no control or which they cannot choose.*



These ideas are not of much practical use, though, unless they can be put to the data. Can we measure how much inequality of opportunity – as opposed to inequality of income, say – there is in the United Kingdom? Can we compare it to, say, the level in France or the United States? Although there are now multiple studies attempting such measurements, they tend to suffer from serious comparability problems. For a start, the right circumstances to use in India (eg, caste) are different from those that matter most in South Africa (eg, race), or Sweden (eg, immigration status). Then there is the troublesome fact that when calculating estimates of inequality of opportunity in this way, choosing combinations of circumstances generally leads to *downward* biases (because not all circumstances are observed in the data) but, in some data sets, sample sizes prove to be “too small” for all the observed combinations, and including too many might lead to an *upward* bias! (See [this paper](#) for the statistical details in all their glory...)

## Introducing the GEOM database

The [Global Estimates of Opportunity and Mobility](#), a new public data repository and website that we launched last week, is a first step towards providing comparable estimates of inequality of opportunity all around the world. Once again, the driving assumption is that the more that outcomes like income vary on account of circumstances which are beyond individuals' choice or control, the greater the inequality of opportunity in that country.

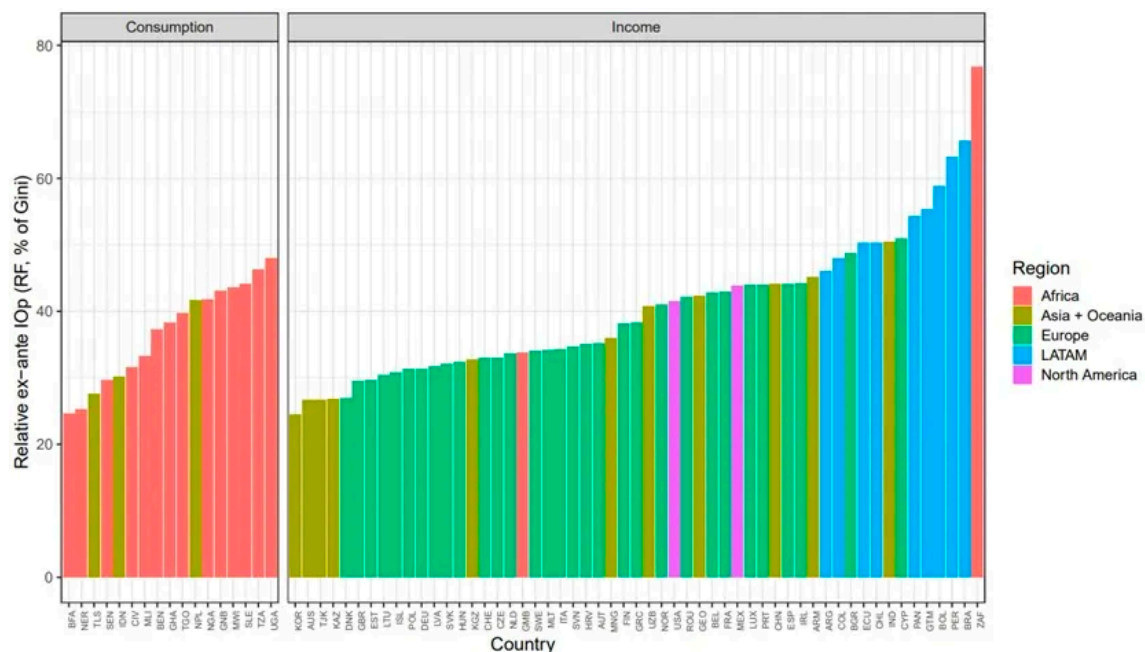
The database does not cover every country in the world – at least, not yet. But this first version does contain estimates for 72 countries, accounting for 67% of the world's population. Because high-quality administrative data containing information on family background is only available for a few countries, and because we want to look where the problem – not simply the light – is, we have to rely primarily on household surveys, at least in this first stage. We have analysed 196 surveys in total; this means that, for some countries, we can observe changes over time.

To address both the problem of choosing the relevant circumstances in each country, and the problem of choosing the sweet spot between downward and upward biases, we rely on state-of-the-art machine learning techniques: conditional inference trees, transformation trees, and random forests. [This paper](#) provides a basic description of some of the main tools.

Figure 1 below summarizes some of the headline results. Each bar represents the share of total inequality that can be predicted by circumstances (parental occupation and education, sex at birth, area of birth, etc.) across the 72 countries, for the latest available year. The figure shows countries in which estimates are based on household consumption expenditure on the left, and household income per capita

on the right. Country names are listed along the horizontal axis, and colours represent world regions.

**Figure 1: Share of total inequality predicted by circumstances outside of individuals' control**



Source: GEOM

Even these headline results are striking. Even in the world's least "opportunity unequal" countries (such as Korea, Australia or Denmark), around a quarter of observed income inequality is inherited and corresponds to unfair inequality of opportunities. At the other end of the spectrum, almost 80% of South Africa's income inequality is unfair. For a cluster of Latin American countries, the share hovers at around 60%. For the US, it is 40% and for the UK, around 30%. And these are, of course, subject to the largest combination of circumstances we can safely consider given sample sizes. Estimates with better data might, eventually, prove to be even higher.

## Outcomes and opportunities: two sides of the same coin?

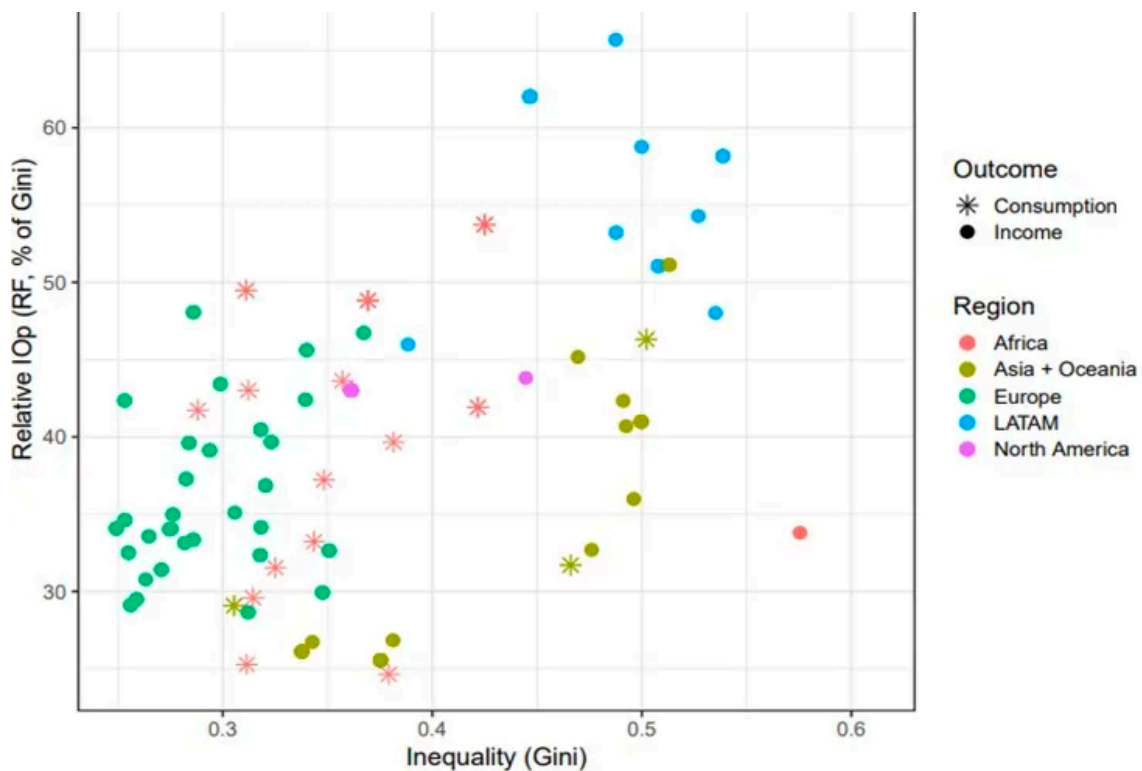
The database also allows researchers to delve deeper, moving beyond these headline measures. Suitable decompositions assess how descriptively important each circumstance is: for example, place of birth matters relatively more in Argentina than in Brazil, while the reverse is true for race. There are alternative estimates that focus on differences in entire distributions (rather than just differences in averages) between groups with different circumstance combinations. There are trees that allow you to visualize how the algorithm picked the key circumstances in each country. And so on.

Looking ahead, in addition to incorporating administrative data sets that contain the relevant variables, we also plan – working together with our many partners in this project (see below) – to collect published estimates of intergenerational mobility which, as we explain [here](#), is a closely related concept.

But that is still to come. For now, we end with Figure 2, which makes a critical – if possibly obvious – point. It plots inequality of realised outcomes (income and consumption) on the horizontal axis, against the inequality of opportunity share on the vertical. As such, it is an “inequality of opportunity” analogue to Miles Corak’s well-known “[Great Gatsby Curve](#)”, inspired by the main character in F. Scott Fitzgerald’s eponymous novel, which showed how more inequality is associated with less intergenerational mobility.

**Figure 2: Great-Gatsby Opportunity Curve**





Source: GEOM

Looking at Figure 2, the positive association is unmistakable (and the correlation coefficient is 0.62). What it shows is that inequalities of outcomes and circumstances are not independent concepts: today's outcomes are tomorrow's opportunities, and vice-versa. They are two sides of the same coin. Going forward, we need to understand and measure each of them so that we can better combat both.

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*Authors' note: while the project is led by researchers at the London School of Economics and the University of Bari, it is a large and complex undertaking, and we drew on a number of partners, including Monash University, the Asian Development Bank, the European Bank for*



*Reconstruction and Development and the Centro de Estudios Espinosa Yglesias. We have also been fortunate to count on the support – financial and otherwise – of the VelezReyes+ Foundation. We expect this list of partners to grow as we update and expand our coverage.*

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### About the author



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**Paolo Brunori**

Paolo Brunori is an Assistant Professorial Research Fellow at the International Inequalities Institute at LSE. His research focuses on inequalities, in particular, the type of inequality that people tend to perceive as unfair. Over the last decade, he has sought to answer

## an apparently simple question: can we measure inequality of opportunity?



**Pedro Salas-Rojo**

Pedro Salas-Rojo is a Research Officer at the International Inequalities Institute. His research focuses on the intergenerational transmission of wealth and income inequalities. He is interested in applying computing techniques, especially those related to Machine Learning algorithms, to delve into the causes and drivers of long-lasting inequalities.

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