Online Appendix for

Measuring Upward Mobility[1]

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Link to paper.

This Appendix provides supplementary material to accompany the main text. A central feature of our measures of upward mobility is their independence from panel data for their application. In Section VI of the main text, we employ our upward mobility measure to assess upward mobility in the United States, Brazil, India, and France using repeated cross-sectional data from the World Inequality Lab (World Inequality Database 2021). This Appendix presents additional details regarding the data utilized and includes some tests to verify the robustness of our findings.

Appendix A. Data

We use the World Inequality Database 2021. It combines fiscal, survey and national accounts data. In countries with small informal sectors and high-quality tax microdata, that tax data is the main source. Surveys and imputation methods are used to make minor adjustments in order to account for non-filers and certain tax-exempt incomes. In contrast, income surveys are the main sources for most emerging economies, and tax datasets are only used to correct the top of the income distribution. Income surveys come mainly from the World Bank (via PovcalNet). The income data are pre-tax total incomes, computed using the equal-split assumption (that is, if the tax unit has more than one income-contributing individual contributing, the assumption is that everyone contributes in equal part to the total income of that tax unit). All incomes are expressed in PPP and in real terms, with a base year of 2021. A detailed description of the methodology is available on the WID website.

For inequality in Section VI.C, we use the 1985 Gini coefficients from the World Bank (WB) supplemented with data from the World Income Inequality Database (WIID) when the former are missing. For observation missing in the World Bank Database, we select from the WIID the Gini values that 1. have been estimated either by the World Bank or alternatively the OECD; 2. are of average or high quality; and 3. are similar to our

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primary source.[2] Not all developing countries had conducted household surveys in 1985 to estimate the Gini coefficient. To fill in the missing values for these countries, we used interpolation techniques based on the available data from surrounding years in a window spanning from 1975-1995. We show below the robustness of our results to using a narrower window of 1980-1990.

To replicate the analysis presented in the paper and this Online Appendix, the necessary data and code can be accessed at Genicot and Ray (2023).

Appendix B. Upward Mobility in the United States: 30 Year Intervals

In Section VI.A of the main text, we show that 30-year upward mobility in the US exhibits a decline very similar to that exhibited by absolute mobility (i.e., the fraction of children who earn more than their parents) estimated by Chetty et al. (2017).

Growth Incidence Curves. The observed decrease in upward mobility and its departure from overall growth can be readily comprehended by examining the growth incidence curves across the period. As illustrated in Figure 1, commencing from the early 1950s the upper income quintile has experienced above-average 30-year growth, while the bottom two quintiles of the income distribution have seen their real growth virtually disappear.

Sensitivity to α. This section shows the robustness of our findings to different values of the pro-poor factor. Figure 2 plots 30-year upward mobility in the US (expressed in annualized percentage terms) for a range of values of α ranging from 0 (Fields and Ok 1999) to 5. The exact value of α does not appear to affect the pattern to any large degree. At the same time, increasing α predictably puts more weight on growth at the lowest quantiles.

Censoring Low Incomes in Chetty et al. (2017)'s Sample. Chetty et al. (2017)'s sample has negative and zero income entries among the poorest percentiles. As observed in Section V.A of the main text, our measure converges to the growth rate of the lowest percentile as $\alpha \to \infty$. Negative or zero values are therefore problematic, especially for large α, and our measure could be sensitive to precise assumptions concerning imputation. We therefore measure upward mobility on the Chetty et al. (2017) data aggregated into deciles. Aggregating the data into deciles is our preferred approach to deal with low income values. Alternatively, we could "censor" Chetty et al. (2017)'s sample and set all

[2]We use Ginis in gross/net income and that cover urban or all areas in the computation.

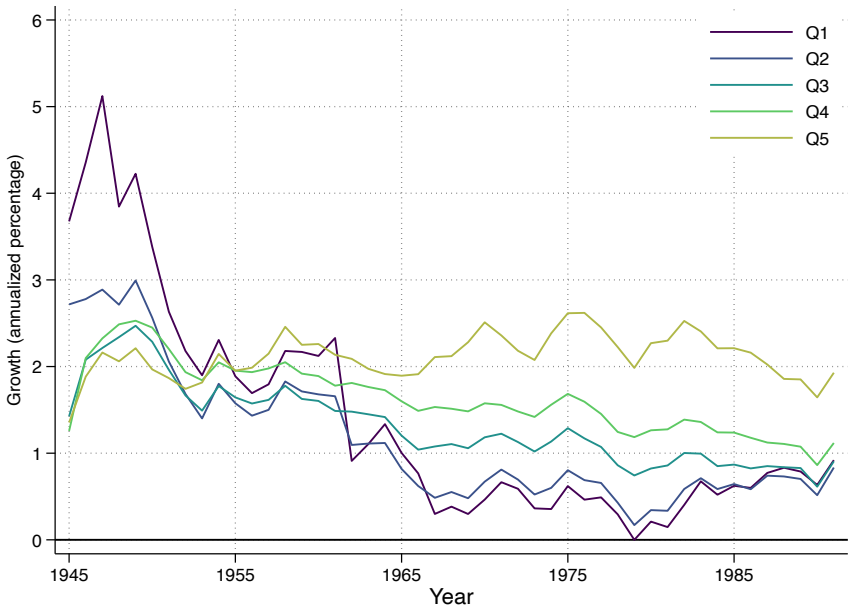


FIGURE 1. GROWTH INCIDENCE CURVES FOR THE UNITED STATES. This diagram shows the annualized growth rate of each income quintile for 30-year intervals, indexed by starting years.

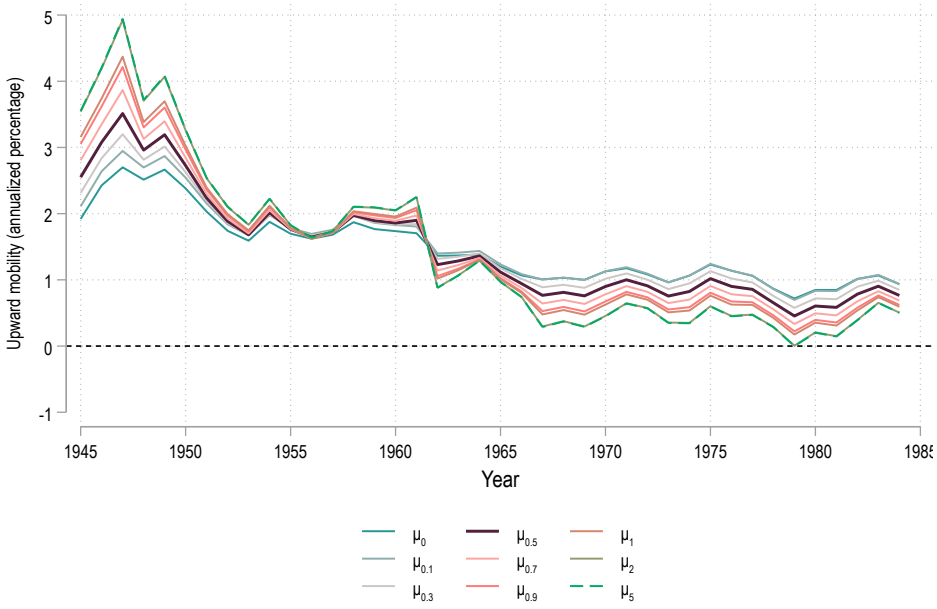
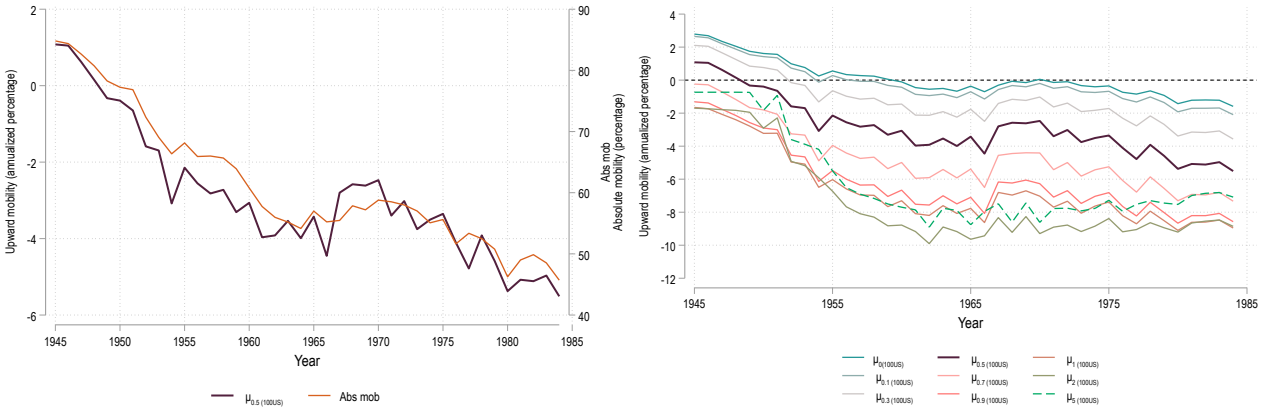


FIGURE 2. UPWARD MOBILITY IN THE US OVER 30-YEAR INTERVALS. This figure displays upward mobility for different α, indexed by starting years.

income values to some minimum; e.g., \$100. However, the level of upward mobility can be sensitive to these imputations, and we avoid them.



(A) Absolute & Upward Mobility, US (B) Different values of α

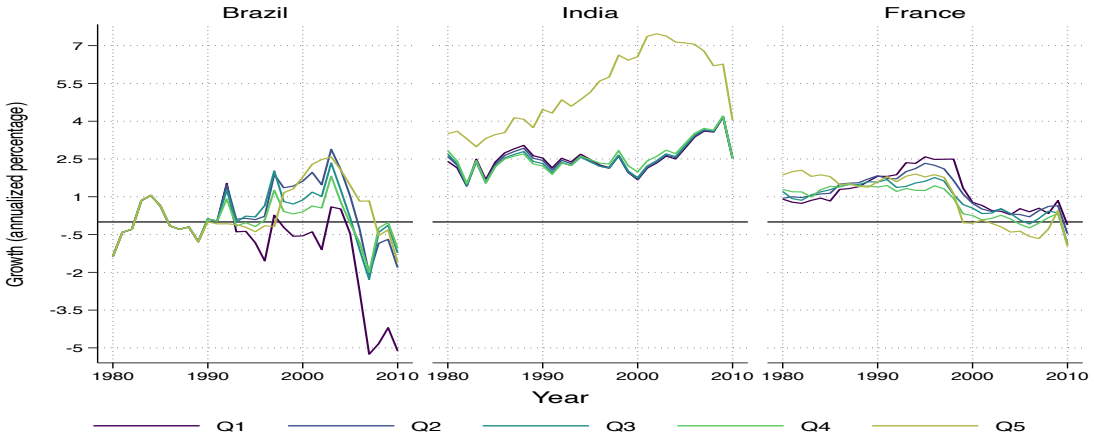
FIGURE 3. CHETTY *et al* DATA CENSORED AT \$100. This figure displays trends in mobility over 30-year intervals for the United States, indexed by starting years. Panel (a) builds on Chetty et al. (2017), censored at \$100 to remove negative and zero incomes, and displays $\mu_{0.5}$ along with the Chetty et al. (2017) measure. Panel (b) displays upward mobility for a range of values of α.

APPENDIX C. BRAZIL, INDIA AND FRANCE

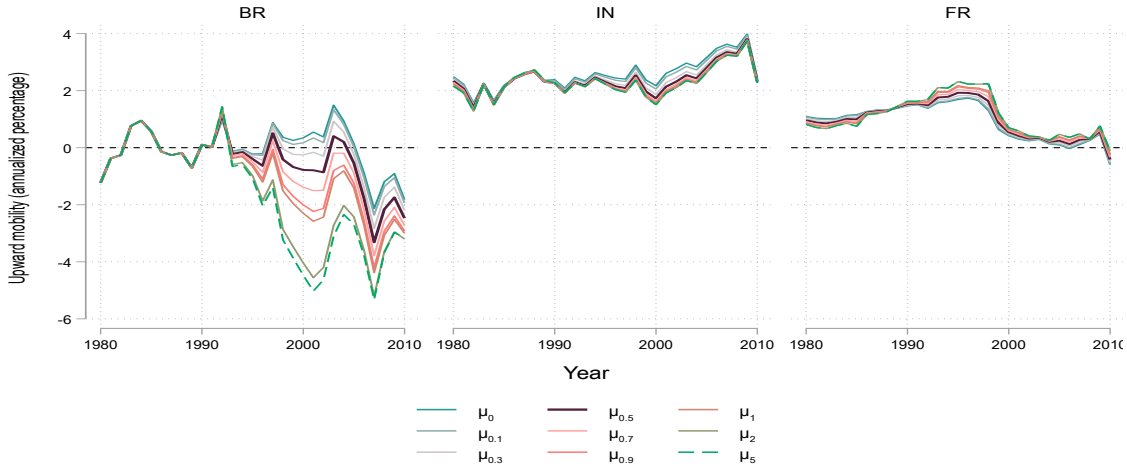
Section VI.B of the main paper applies our measures to study 10-year upward mobility in Brazil, India and France using decile data from the WID.

Growth Incidence Curves. Panel (a) of Figure 4 shows ten-year growth rates by quintile for each country.

Sensitivity to α. As we did for the US data, we explore the robustness to α. Panel (b) of Figure 4 plots 10-year upward mobility in Brazil, India and France for values of α ranging from 0 to 5. We see that the measure is not very sensitive to the exact value of α for India where similar growth was experienced by the bottom four quintiles (see Panel (a)). In Brazil and France, where the growth patterns among the lower quintiles are more differentiated, increasing α affects upward mobility in a predictable manner: it lowers it in Brazil where the bottom quintile fared relatively poorly and increases it in France when the bottom quintiles outperform the others.



(A) Growth Incidence



(B) Upward Mobility

FIGURE 4. GROWTH INCIDENCE AND UPWARD MOBILITY OVER 10-YEAR INTERVALS, VARIOUS α. Panel (a) shows annualized growth rates for each quintile over ten-year intervals. Panel (b) displays trends in upward mobility (in annualized percentages) for different values of α. Both are indexed by starting years.

APPENDIX D. THE GREAT GATSBY CURVE

Finally, the paper revisits the "Great Gatsby curve." In a study famously cited in a speech by Alan Krueger in 2012. Corak (2013) found a *negative relationship* between income inequality and intergenerational income mobility.

Figure 7 of the main text shows that 30-year upward mobility as measured by us ($\mu_{0.5}$) and inequality continue to be inversely correlated for the countries considered by Krueger/Corak (2013). Gini coefficients ten percentage points higher tend to be 0.7 percentage points less upwardly mobile. Figure 5 in this Appendix shows that a negative

albeit insignificant correlation between inequality and *relative* upward mobility ($\rho_{0.5}$) is also observed in the same sample.

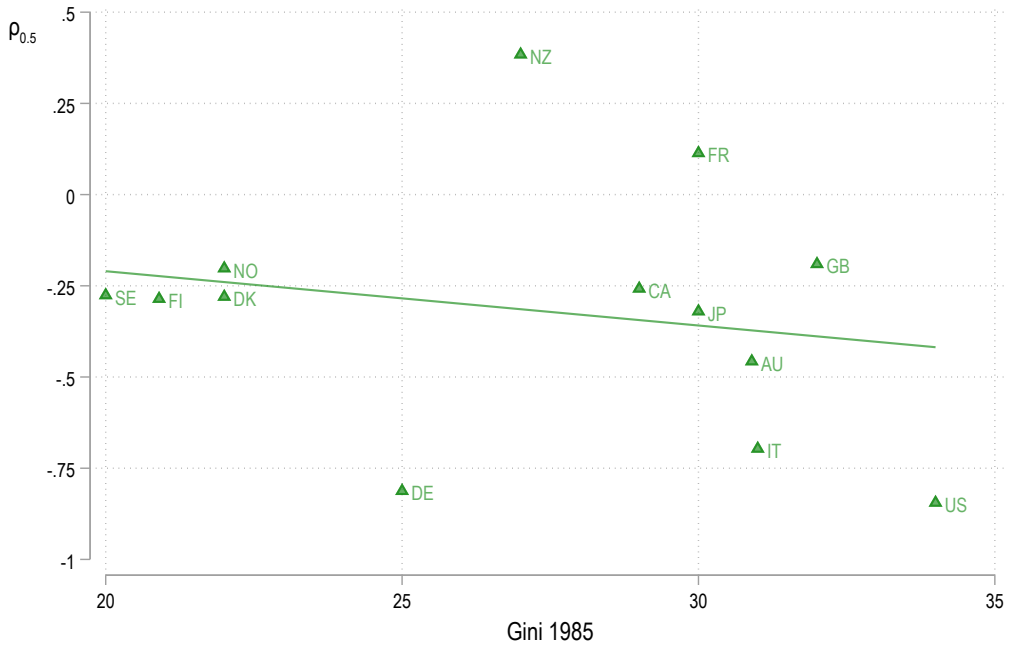


FIGURE 5. GREAT GATSBY CURVE. This figure plots, for the same countries as Corak (2013), relative upward mobility $\rho_{0.5}$ in annual percentage terms over 1985-2015 on the vertical axis, and the Gini coefficient of inequality around the mobility baseline year on the horizontal axis, for OECD countries. Mobility is measured using income deciles from the World Inequality Database (2021) and the Ginis are taken from Corak 2013.

Figure 6 replicates Figure 8 from the main text, but only for a subsample of countries that meet specific criteria (38 out of 71 countries). Specifically, we included countries for which either the Gini coefficient was available for 1985 or two values of the Gini coefficient were available within the 1980-1990 window, with one value below and one value above 1985. Our analysis shows that the patterns in both figures are highly similar.

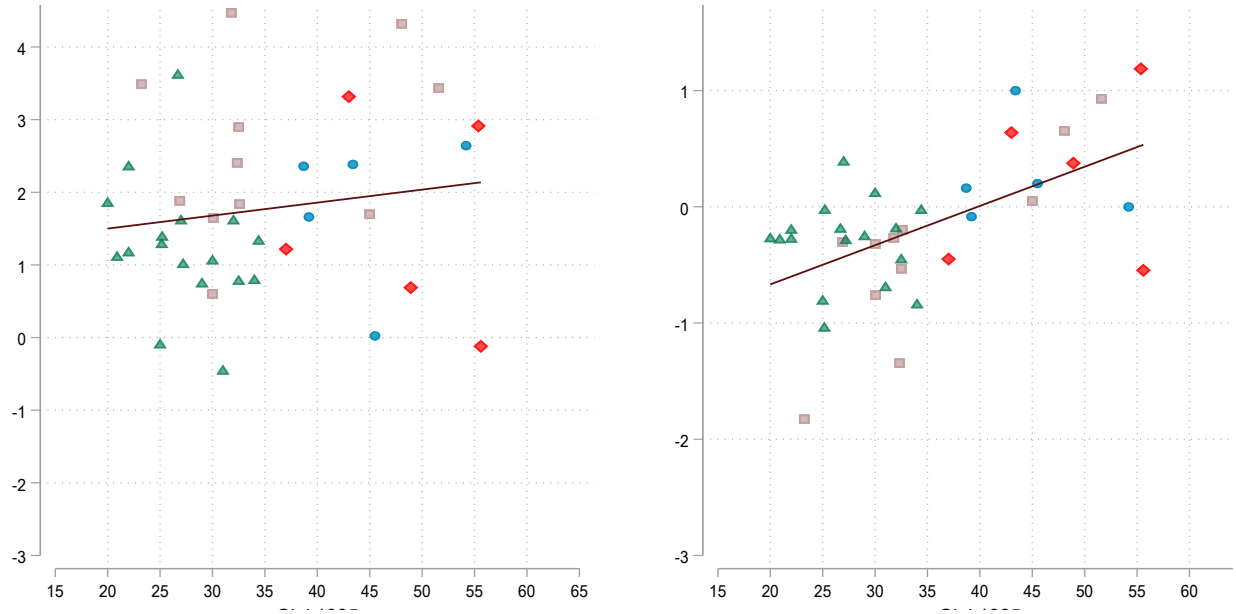


FIGURE 6. GREAT GATSBY CURVE. Following Krueger (2012), these panels plot mobility on the vertical axis and the Gini coefficient of inequality in the base year on the horizontal axis. The left panel displays upward mobility $\mu_{0.5}$ and the right panel relative mobility $\rho_{0.5}$ over the 1985-2015 intervals expressed as annualized percentages, along with linear fits for all the countries. Sources: World Inequality Database (2021) and the World Income Inequality Database.

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World Inequality Database (2021) http://wid.world/data/.