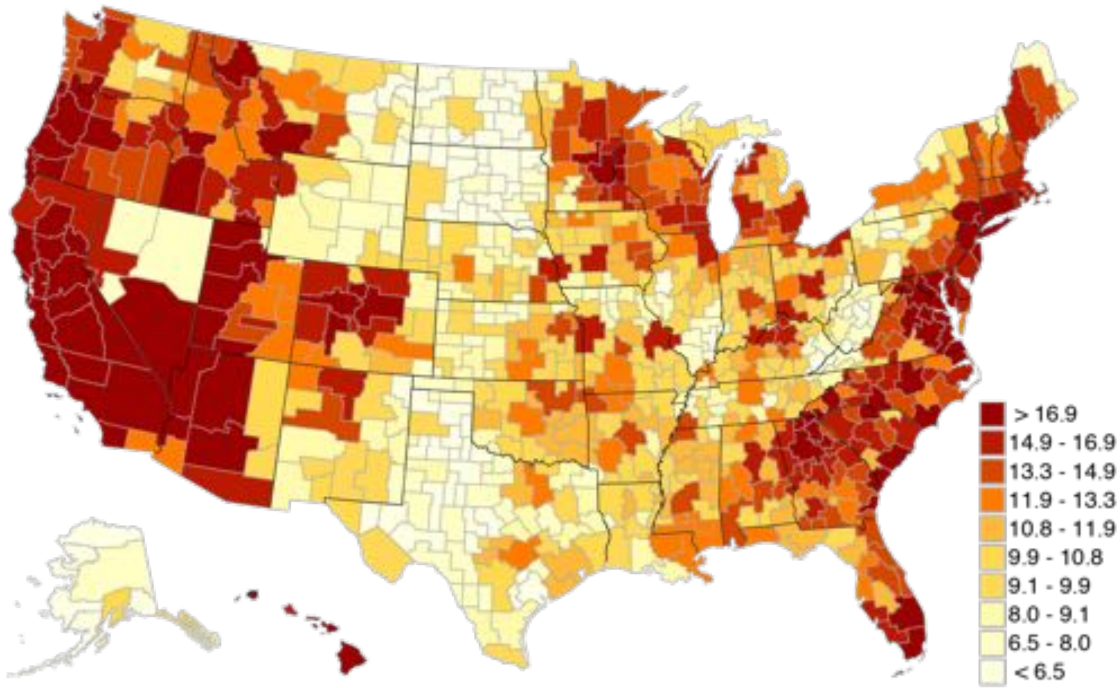
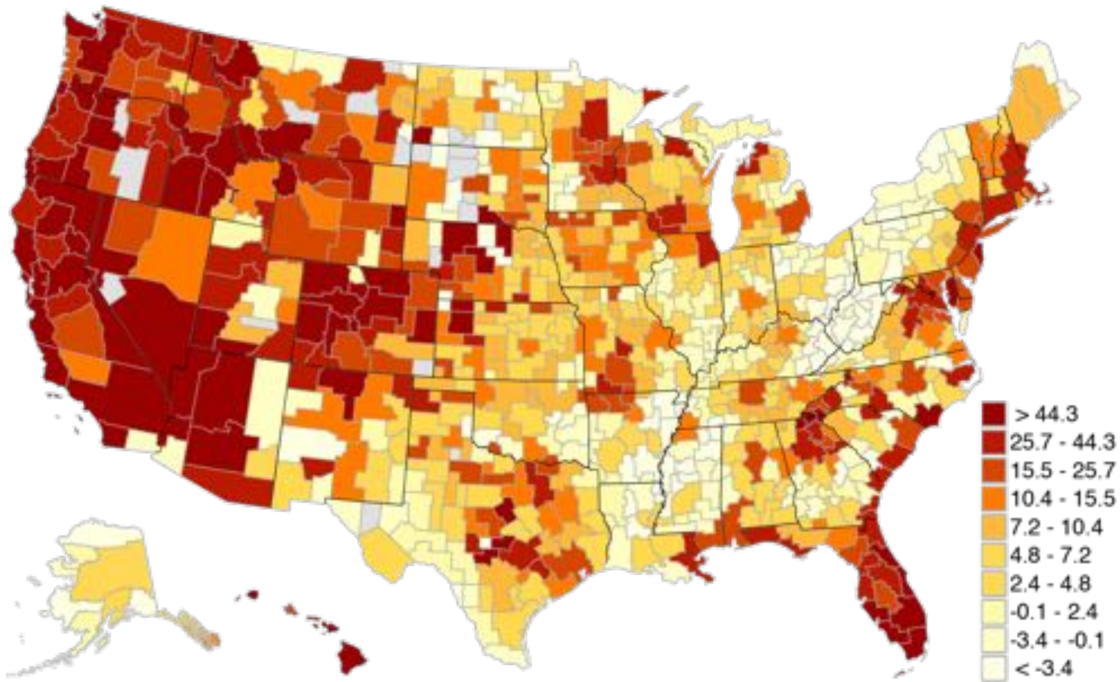
FIGURE I: Overall Tax Expenditures
(% Tax Expenditures/AGI)



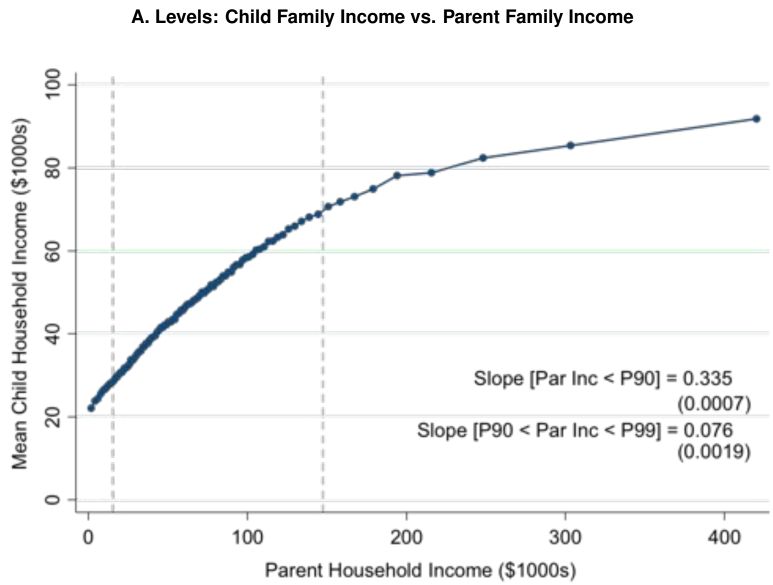

Notes: This figure maps CZ mean tax expenditures as a percentage of average Adjusted Gross Income (AGI). Darker areas represent higher tax expenditures. Data are from the IRS Statistics of Income ZIP Code Individual Income Statistics (2008).

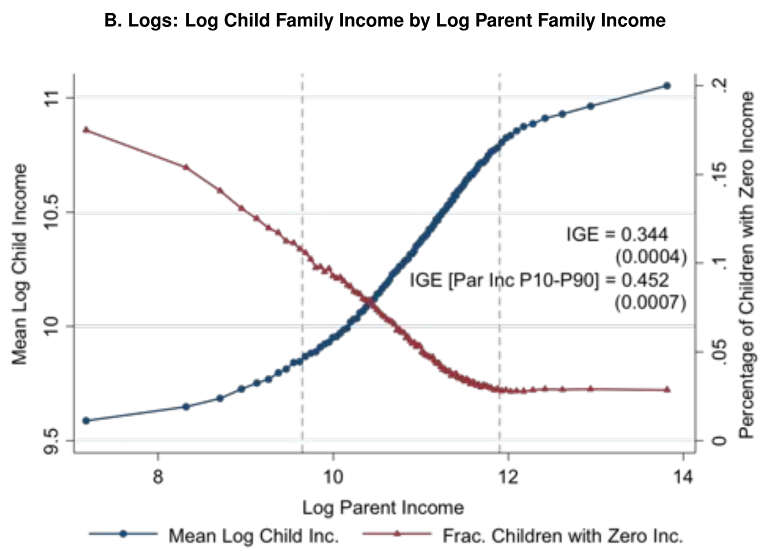
FIGURE II: Progressivity of Tax Expenditures
(% Tax Expenditures/AGI, for Lowest - Highest AGI Class)




Notes: This figure maps CZ difference in mean tax expenditures as a percentage of average Adjusted Gross Income (AGI) for individuals with less than \$10,000 AGI and individuals with over \$200,000 AGI. Darker areas represent more progressive tax expenditures. Data are from the IRS Statistics of Income ZIP Code Individual Income Statistics (2008).

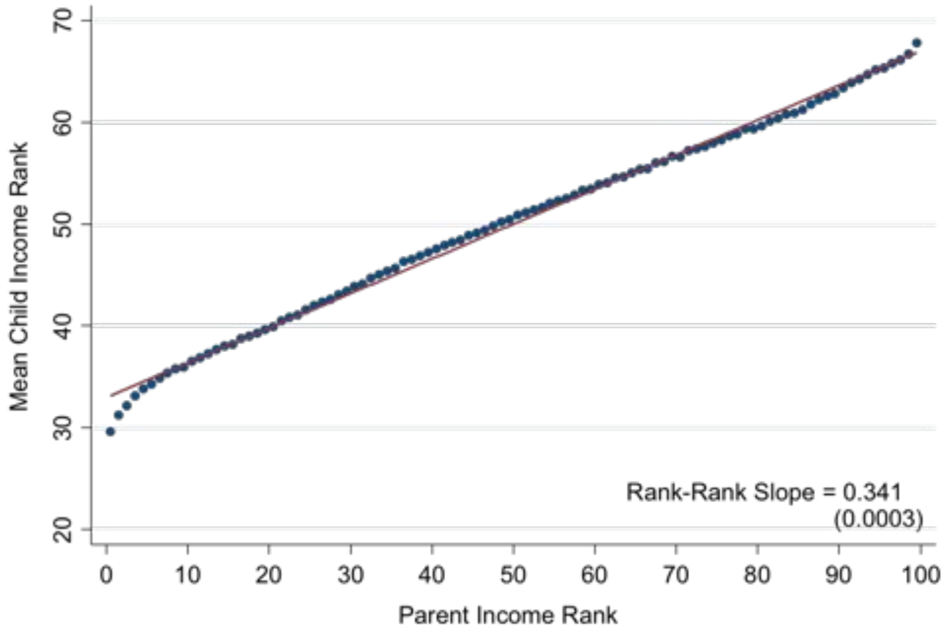
FIGURE III: The Association Between children's and Parents' Income in the United States



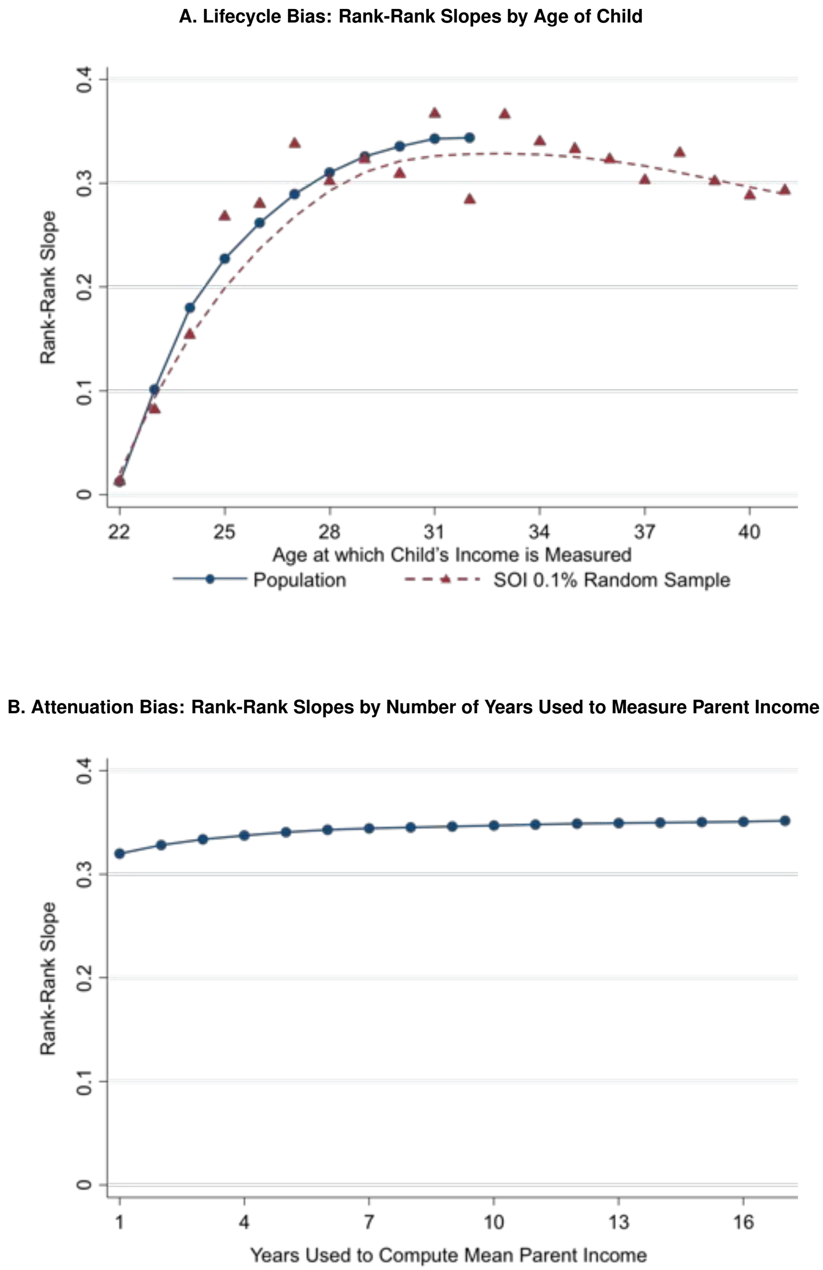

Notes: Panel A depicts mean child family income (y-axis) against mean parent family income (x-axis). Panel B depicts mean child log family income (left y-axis) and the fraction of children with zero family income (right y-axis) against mean parents' log family income (x-axis). The graphs are based on the core sample of all children born in 1980-82 who are current U.S. citizens and can be matched to parents through tax return data (see Table 1). Child income is the average of 2011-2012 (when the child was around 30) while parent income is the average of 1996-2000 (when the child was a teenager). All dollar values are reported in 2010 dollars. To construct the figures, we group parents by percentiles of income (excluding parents with zero or negative income) and calculate the mean of the y-axis variable in each percentile. In panel B, children with zero family income are naturally excluded in the log-income means. The 10th and 90th percentile of parents' income are depicted in dashed vertical lines. Panel A excludes the top percentile for readability. Both panels show a nonlinear relationship between parent and child income with lower slopes in the upper tail in panel A and both the upper and lower tails in panel B. The slopes obtained using OLS regressions on the binned data are reported. In panel A, we report separate slopes below and above the 90th percentile. In panel B, we report slopes of the log-log regression in the full sample and for parents between the 10th and 90th percentiles. Panel B estimates are conventional intergenerational income elasticities. Such elasticities are sensitive to excluding the tails for parents' income and the treatment of children with zero income.

FIGURE IV: The Association Between children's Percentile Rank and Parents' Percentile Rank




Notes: The figure depicts mean family income rank of children (y-axis) by percentile rank of family income of parents' (x-axis). The US series are based on the core sample of all children born in 1980-82 who are current U.S. citizens and can be matched to parents through tax return data (see Table 1). Child income is the average of 2011-2012 (when the child was around 30) while parent income is the average of 1996-2000 (when the child was a teenager). To construct the figure, we group parents by percentiles of income (excluding parents with zero or negative income) and calculate the mean rank of child family income for each percentile of parents' income. The rank-rank relationship is very close to linear along the full distribution of parental income with a slope of 0.341. Slopes are estimated with an OLS regression on the microdata.

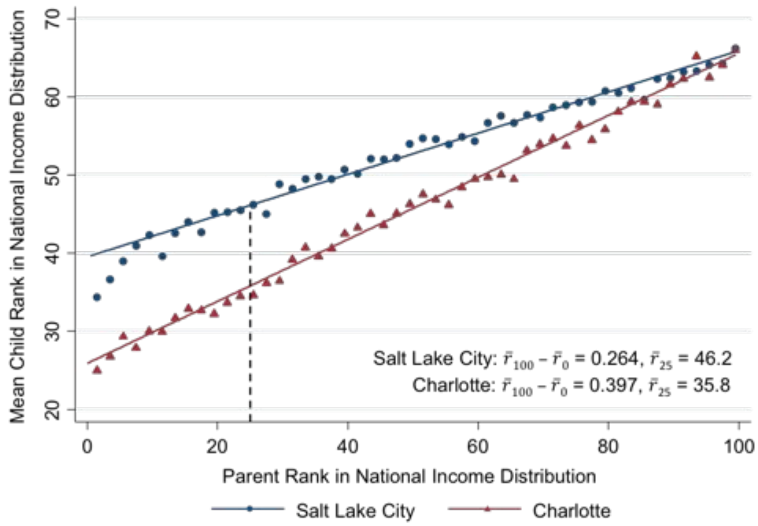
FIGURE V: Robustness of Intergenerational Mobility Estimates



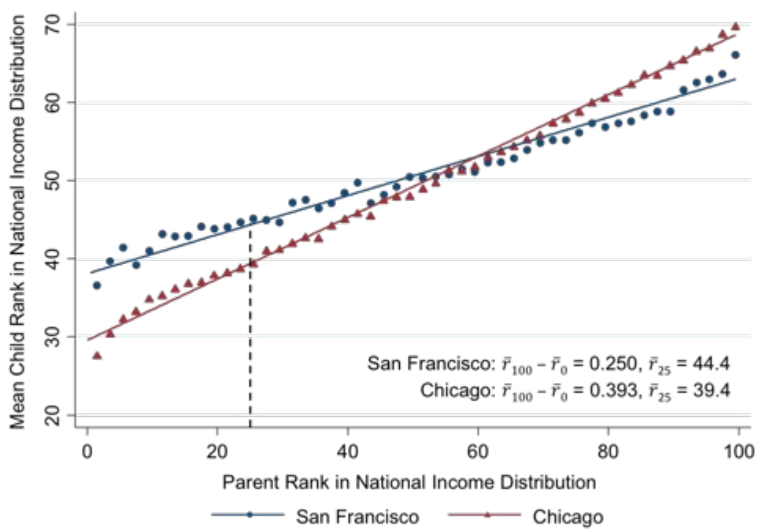

Notes: The figure depicts the robustness of the rank-rank slope coefficient from Figure 2A to changes in the age at which child income is measured (Panel A) and the number of years used to measure parent's income (Panel B). Child income is always the average of 2011-2012. Each point in Panel A shows the slope coefficient from an OLS regression of child income rank on parent income rank as we vary the child cohort and hence the age at which child income is measured. The first point corresponds to the 1990 cohort, who are around 22 when income is measured. The last point corresponds to the 1980 cohort, who are around 32 when income is measured. The slope increases sharply from zero at age 22 (when many children are still in college) to 0.34 at age 32. The slope increases very slowly after age 29 suggesting that measuring child income at age 30-32 is acceptable. In Panel B, we always consider the core sample of children born in 1980-2 who are current U.S. citizens and can be matched to parents through tax return data (see Table 1). Each point shows the slope coefficient from the same rank-rank regression, but here we vary the number of years used to compute mean parent income. The point for one year uses data for 1996 only. The point for two years adds data for 1997. We continue adding data until 2011, which gives us 16 years of data. The slope increases only modestly when increasing the number of years from 1 to 5 and is very stable for 5 or more years suggesting that using 5 years for parents' income is acceptable.

FIGURE VI: Intergenerational Mobility in Selected Commuting Zones

**A. Salt Lake City vs. Charlotte**



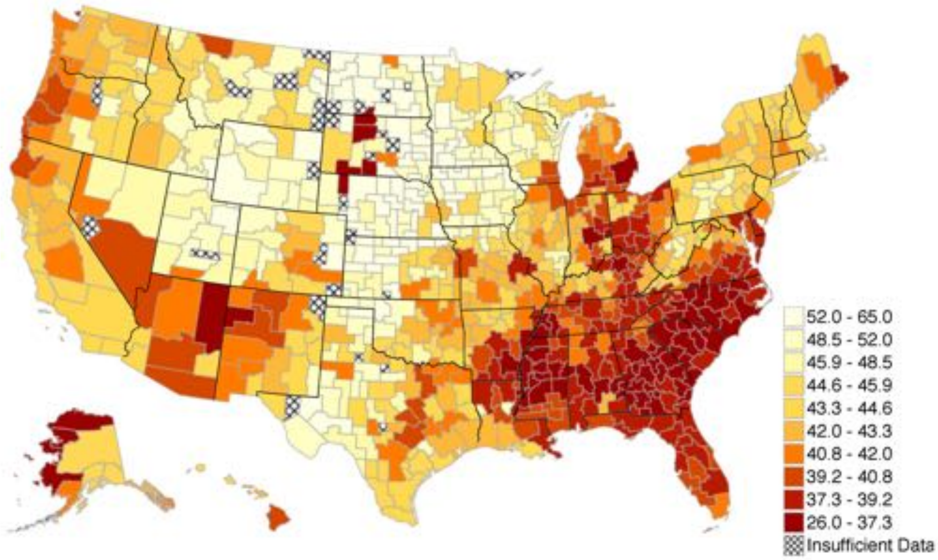

**B. San Francisco vs. Chicago**



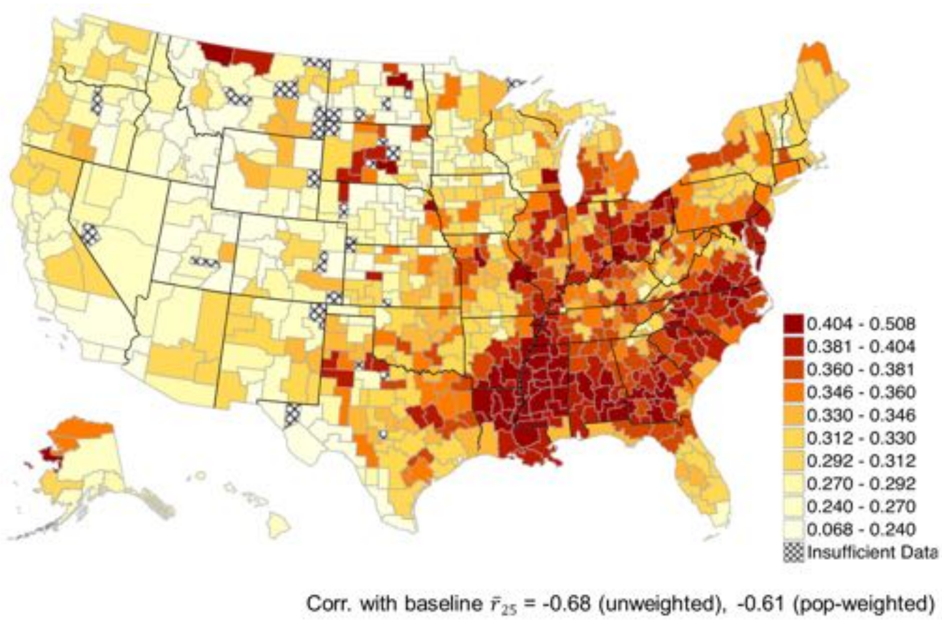

Notes: The figure depicts mean child family income rank (y-axis) by percentile rank of parent family income (x-axis) for selected cities (Metropolitan Statistical Area). Panel A depicts Salt Lake City and Charlotte. Panel B depicts San Francisco and Chicago. The series are based on the core sample of all children born in 1980-82 who are current U.S. citizens and can be matched to parents through tax return data (see Table 1). Child income is the average of 2011-2012 (when the child was around 30) while parent income is the average of 1996-2000 (when the child was a teenager). Cities are based on the location of parents (when the child was a dependent). Parent and child percentile ranks is always defined at the national level, not the city level. To construct the figures, we group parents by national percentiles of income (excluding parents with zero or negative income) and calculate the mean national rank of child family income for each percentile of parrents' income. To reduce noise, percentiles are grouped in pairs. Both panels include the best linear fit. Dashed orange lines highlight our two intergenerational mobility concepts. The difference between the heights at the 100th percentile of parent income and the 0th percentile of parent income corresponds to Relative Mobility ($Y_{100} - Y_0$) for the same city. The height of the vertical line at the 25th percentile of parent income corresponds to Absolute Upward Mobility ($Y_{25}$) for the city in blue circles. Because of linearity, Absolute Upward Mobility ($Y_{25}$) is the same as ($Y_{[0,50]}$) which is the average rank of children with parents in the bottom half of the distribution reweighted using the national distribution.

FIGURE VII: The Geography of Intergenerational Mobility in the U.S.

**A. Absolute Upward Mobility: Mean Child Rank for Below-Median Parents ($Y_{25}$) by CZ**



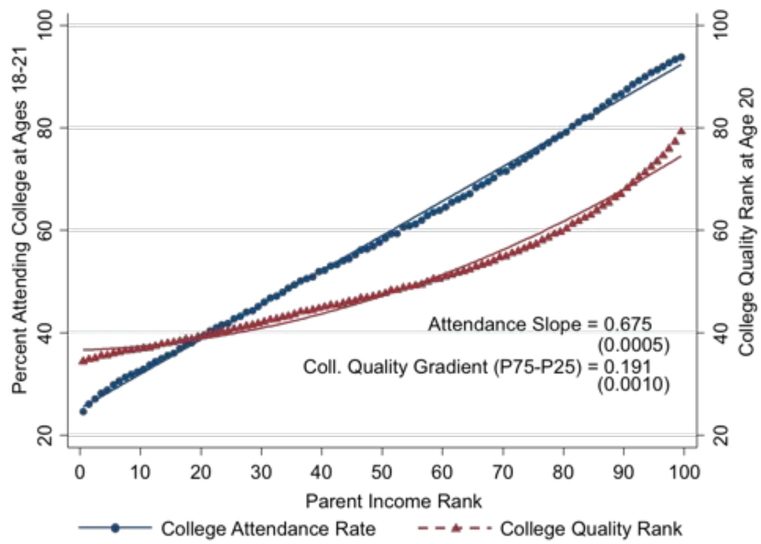

**B. Relative Mobility: Rank-Rank Slopes ($Y_{100} - Y_0$) by CZ**



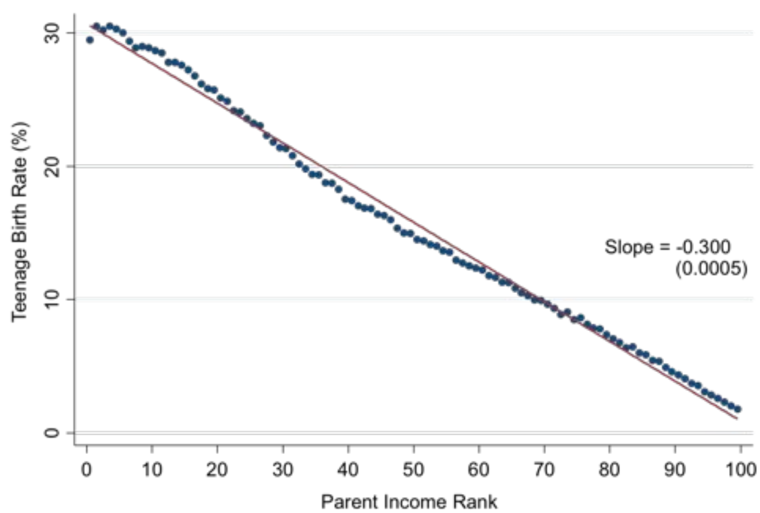

Notes: The figure maps two of our baseline measures of intergenerational mobility by Commuting Zone (CZ). The series are based on the core sample of all children born in 1980-82 who are current U.S. citizens and can be matched to parents through tax return data (see Table 1). Child income is the average of 2011-2012 (when the child was around 30) while parent income is the average of 1996-2000 (when the child was a teenager). CZs are based on the location of parents (when the child was a dependent). In each CZ, we run an OLS regression of child income rank (at the national level) on a constant and parent income rank (at the national level). Panel A depicts Absolute Upward Mobility defined as the intercept + .25*slope ($Y_{25}$), which corresponds to the fitted value for parent income at the 25th percentile (see Figure 5). A light color implies more mobility. Panel B depicts Relative Mobility defined as the rank-rank slope coefficient ($Y_{100} - Y_0$) for each CZ (see Figure 5). A light color implies more mobility. Panels A and B show that both mobility measures are strongly correlated (the population-weighted correlation coefficient is -0.62).

FIGURE VIII: Gradients of College Attendance and Teenage Birth by Parent Family Income Rank

A. Child College Attendance Rate by Parent Income Rank

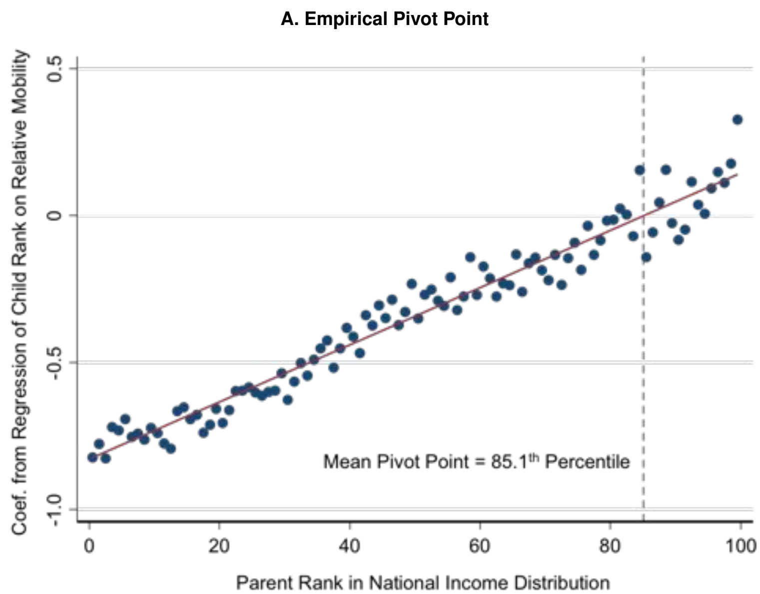


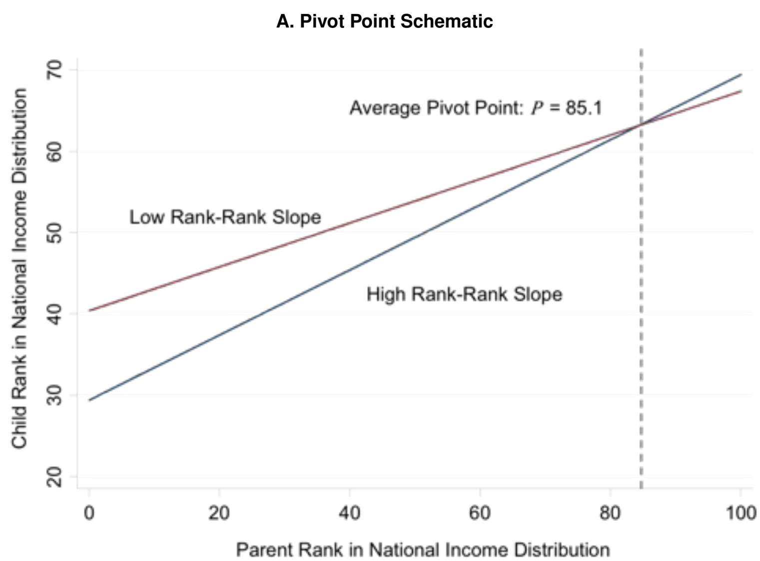

B. Child Teenage Birth Rate by Parent Income Rank




Notes: The figure depicts child college attendance rate (in Panel A) and child teenage birth rate for female children (in Panel B) by percentile rank of parent family income. The series are based on the core sample of all children born in 1980-82 who are current U.S. citizens and can be matched to parents through tax return data (see Table 1). Parent income is the average of 1996-2000 (when the child was a teenager). College attendance is defined as ever attending college from age 18 to 21, where attending college is defined as presence of a 1098-T form. Teenage birth is defined as having a child while being aged 19 or less. To construct the figures, we group parents by percentiles of income (excluding parents with zero or negative income) and calculate the mean of the y-axis variable in each percentile. The regression coefficients, standard errors, and best-fit lines are computed on the micro data. The rank-rank relationship is very close to linear in both panels. The slope for college attendance is extremely steep at 0.68. The slope of teenage birth rate is -0.22.

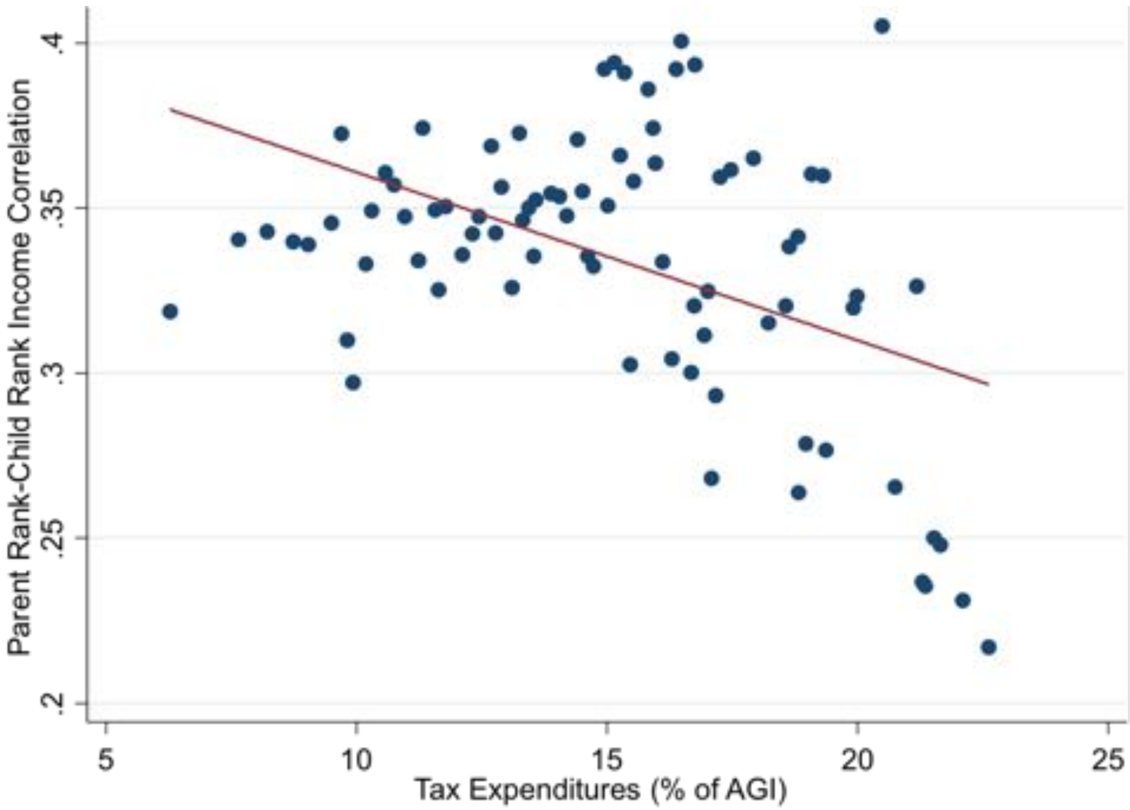
FIGURE IX: Relationship between Absolute and Relative Mobility



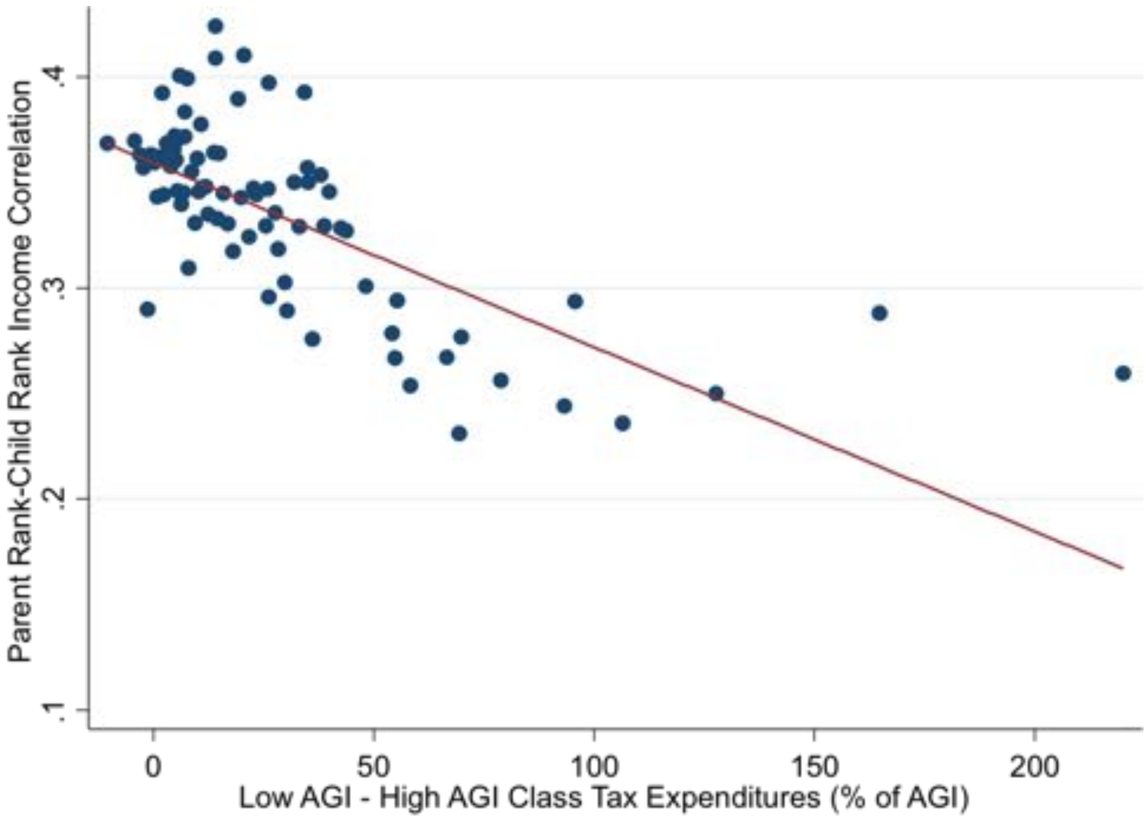

Notes: This schematic graph illustrates the relationship between absolute and relative mobility. On average, our empirical results show that there is more variation in outcomes across cities for children with parents at the bottom of the distribution (represented by the intercept with the y-axis at the 0th percentile in parent income in the rank-rank diagram) than for children with parents at the top of the distribution. On average, outcomes vary the least around percentile 85 for parents as if the rank-rank linear relationship across CZs were "pivoting" around parents' percentile 85 as depicted in the schematic.

FIGURE X: CZ Tax Expenditures and Intergenerational Income Correlation



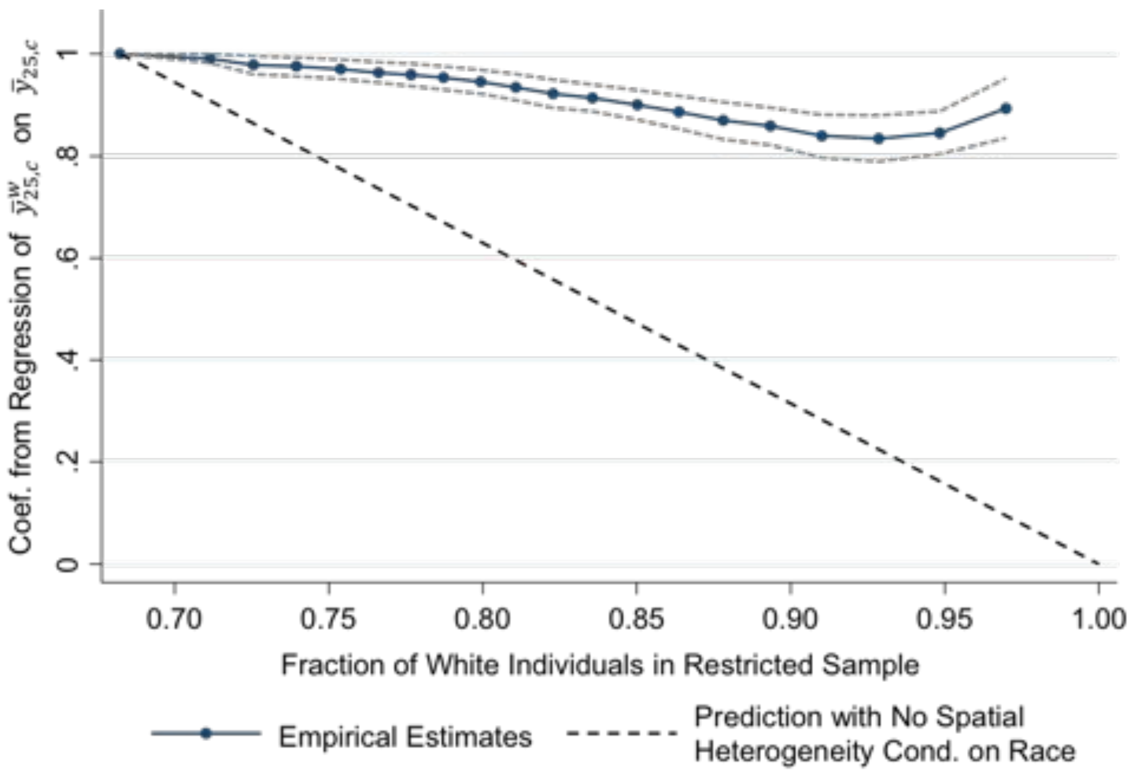

Notes: This figure displays a binned scatterplot of the relationship between CZ aggregate tax expenditures as a percentage of AGI in 2008 and the CZ IGE as measured by the correlation between parent rank income and child rank income. See Section 2.2 for more details on the construction of the tax expenditure and IGE measures. To generate the binned scatterplot, we group CZs into centiles (one-hundred equal-sized bins) on tax expenditures as a percentage of AGI, weighting by CZ population. The dots represent the weighted means of the IGE and tax expenditure measure. The best-fit line is calculated from a regression on the CZ level data.

FIGURE XI: CZ Progressivity of Tax Expenditures and Intergenerational Income Correlation




Notes: This figure displays a binned scatterplot of the relationship between progressivity of CZ tax expenditures and IGE as measured by the correlation between parent rank income and child rank income. Eight CZs with over 300% difference in tax expenditures are excluded from the figure and best-fit line. See Section 2.2 for more details on the construction of the tax expenditure and IGE measures. See notes to Figure 4 for further explanation of construction of the binned scatterplot.

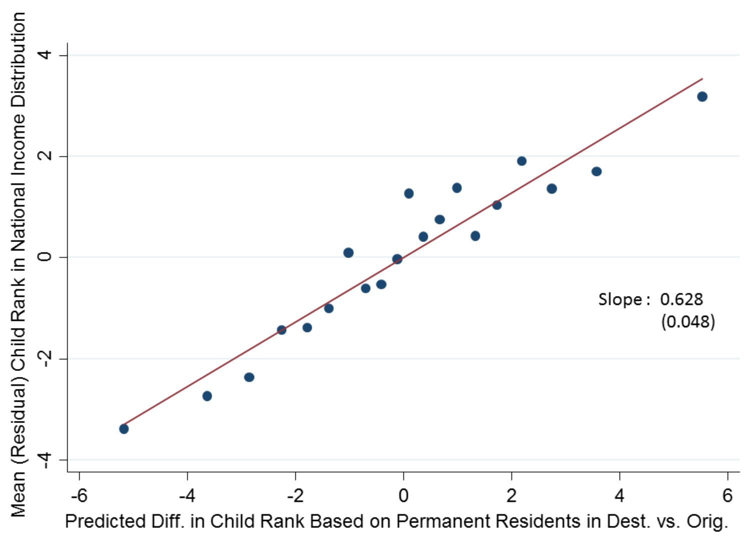
FIGURE XII: Impact of Changing Racial Composition of Sample on CZ-Level Estimates of Upward Mobility



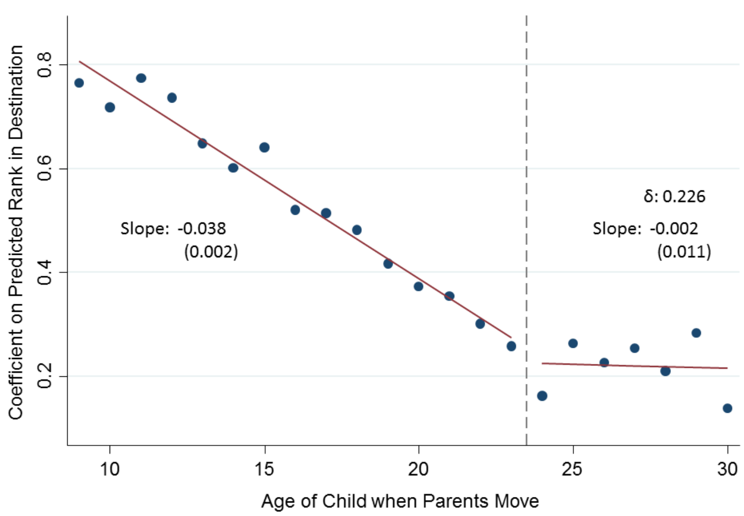

Notes: This figure plots the relationship between our main IGE rank-rank slope estimates and rank-rank slope estimates computed restricting to zip codes with a varying minimum threshold of the share of white residents. Fraction white and black is computed in the 2000 Census using 5-digit ZCTAs that are then matched to 5-digit address ZIP codes in 1999 (see text for complete details).We first compute Absolute Upward Mobility estimates by CZ limiting the sample to 5-digit zip codes with at least x% of white residents (based on the 2000 Census), which we denote as the x%+ white sample. The graph reports the regression coefficient from an unweighted regression of Upward Mobility estimates in the full core sample and in the x%+ white sample for x ranging between 0 and 95%. The confidence interval is based on standard errors that are clustered at the state level. The regression coefficient is above 0.8 even for high x showing that whites living in an CZ with many non-whites tend to experience the same mobility patterns as the full population in the CZ.

FIGURE XIII: Impact of Moving to a Different Area on Child's Outcomes

**A. Impact of Neighborhood Quality on Childrens' Outcomes**

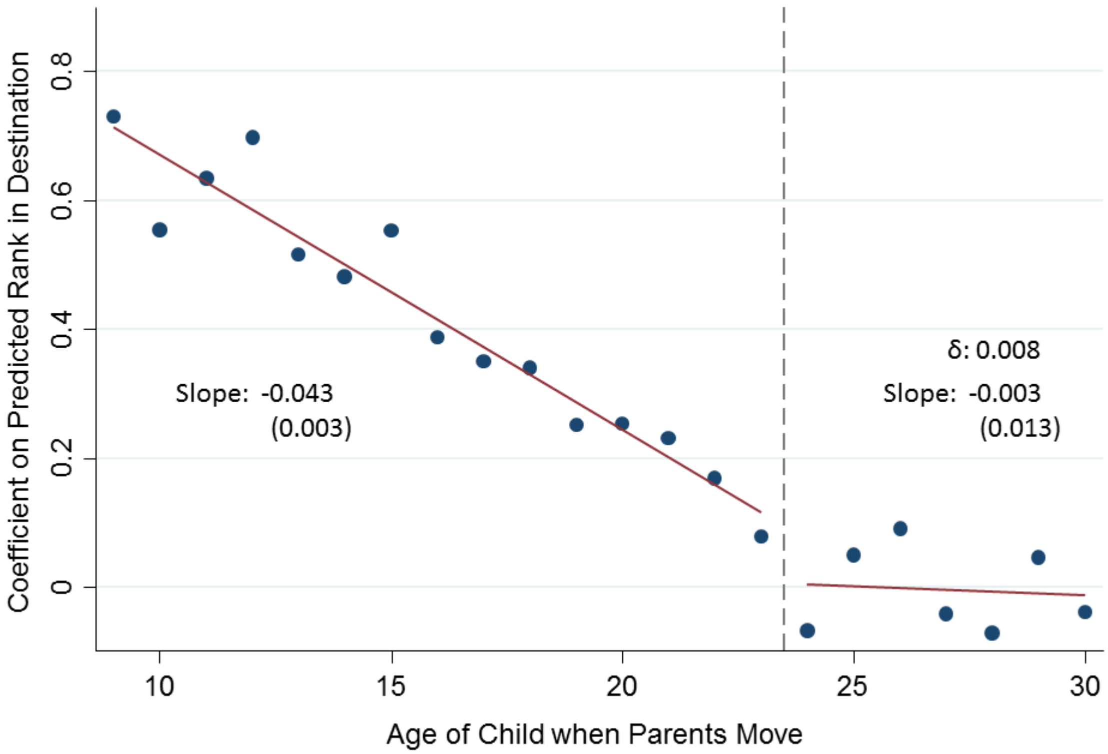



**B. Impact of Neighborhood Quality on Childrens' Outcomes by Child's Age at Move**



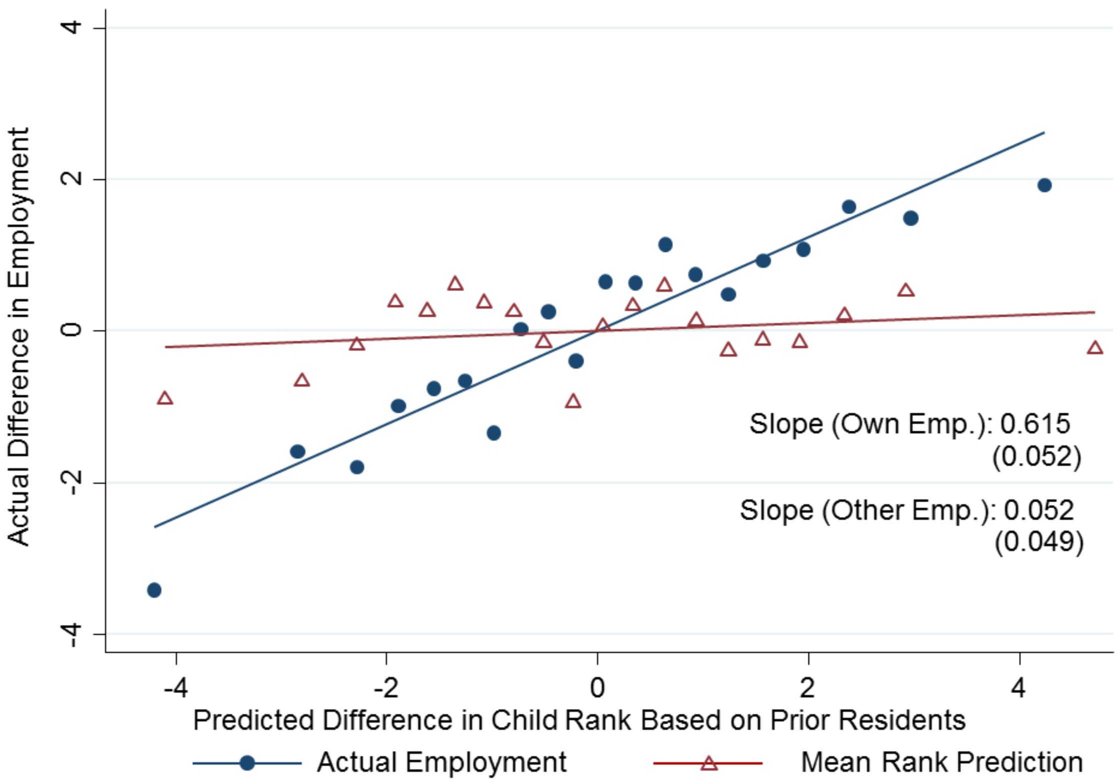

Notes: The top panel depicts the actual mean child income rank against the expected income rank of the child given the parent income and CZ of residence for children that moved before age 13. The bottom panel shows the effect of moving to a better city on child outcome by age at which the move takes place.

FIGURE XIV: Impact of Moving to a Different Area on Child's Outcomes
(Family Fixed Effects)



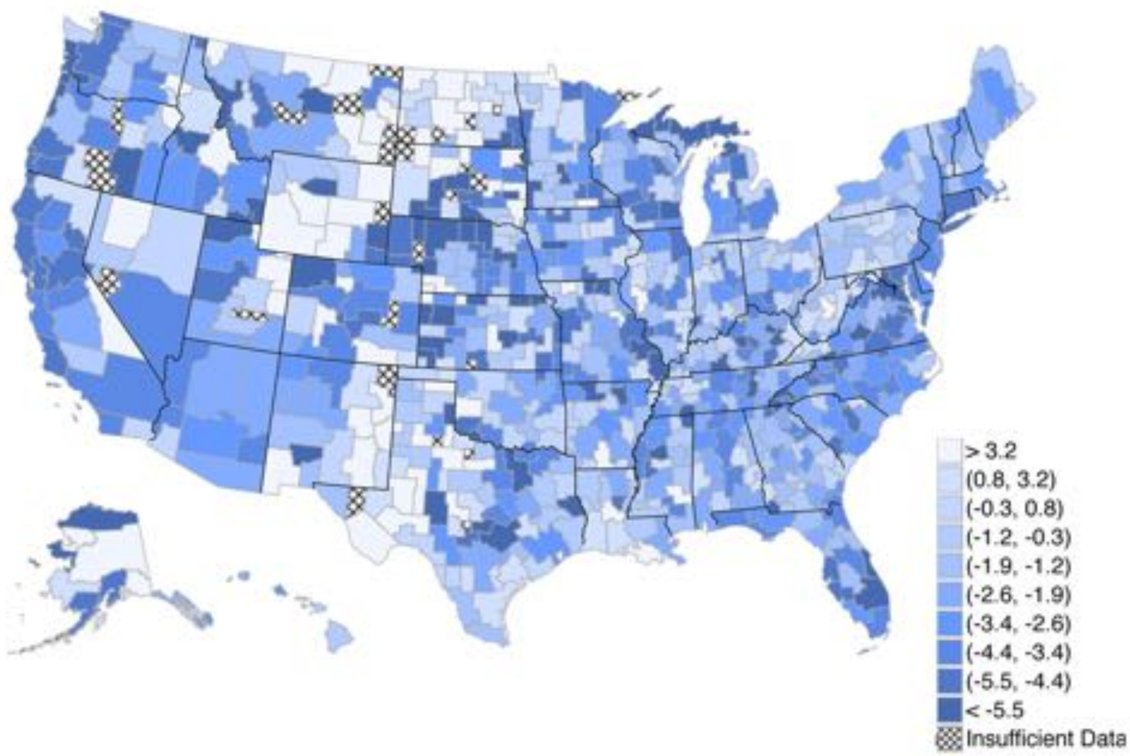

Notes: This figure replicates Figure XIIIb but controls for changes in marital status that are coincident with moves and includes family fixed effects.

FIGURE XV: Stayers Employment vs. Mean Rank as Predictors of Movers Employment



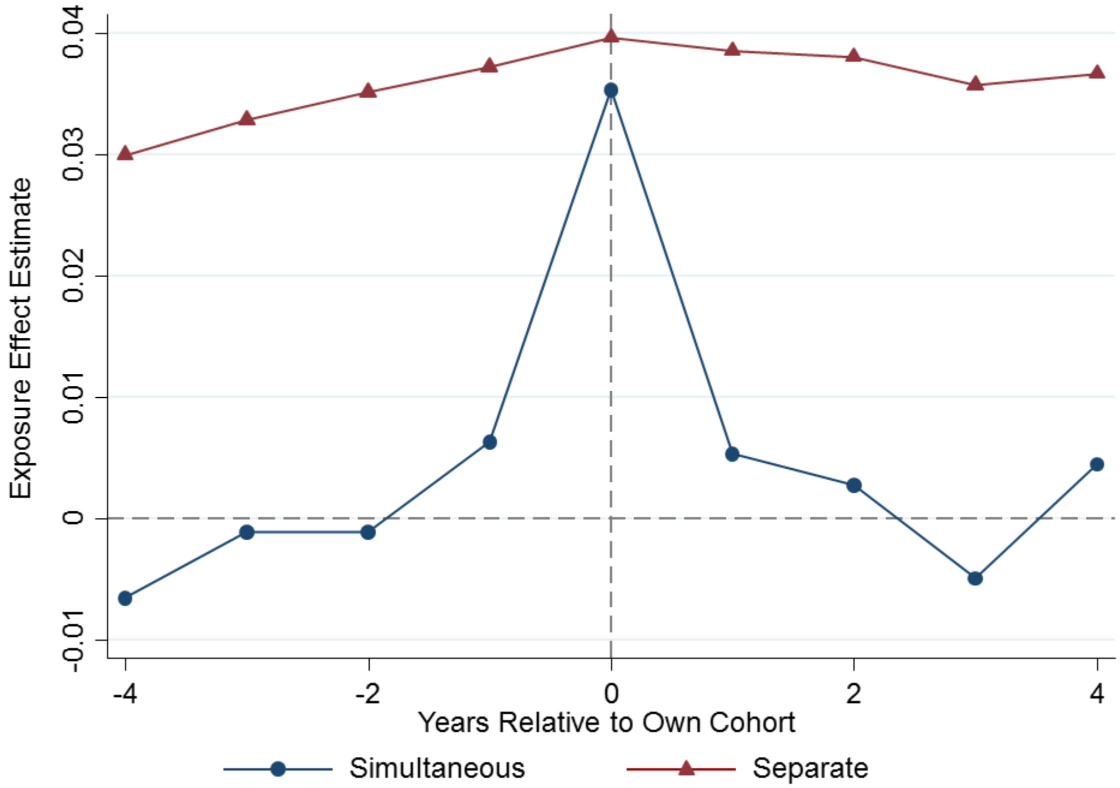

Notes: This figure shows that the employment rate of stayers is a sufficiently good predictor of the employment outcomes of movers and that income ranks add very little predictive power beyond employment rates. The figure uses the core sample of movers. The points correspond to binned means (in vingtile groups) from a regression of an indicator for being employed in 2011-12 on the expected difference in employment rates and child income ranks based on estimates from stayers. The regression also controls for the expected employment rate and child income rank of stayers in the origin.

FIGURE XVI: Difference in Absolute Upward Mobility for Boys vs. Girls



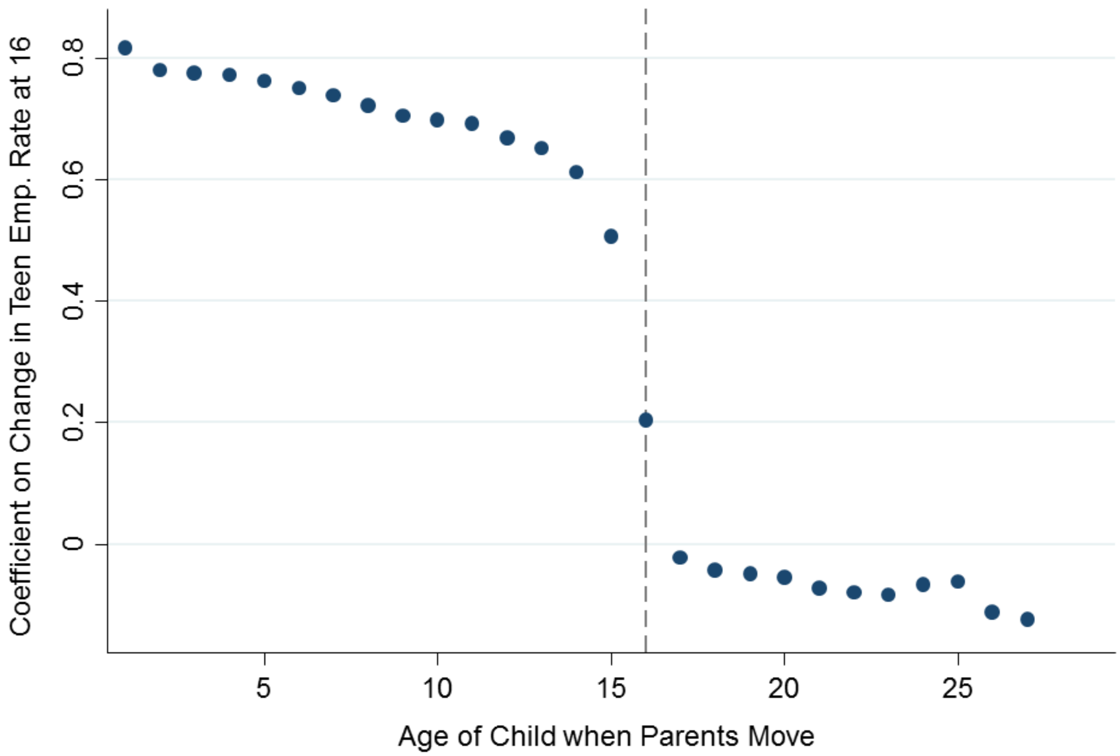

Notes: This map shows the difference in absolute upward mobility for boys and girls. The series are based on the core sample of all children born in 1980-82 who are current U.S. citizens and can be matched to parents through tax return data (see Table 1). Child income is the average of 2011-2012 (when the child was around 30) while parent income is the average of 1996-2000 (when the child was a teenager). CZs are based on the location of parents (when the child was a dependent). To construct absolute upward mobility for boys, we restrict the sample to boys and replicate the methodology used in Figure VIIa (similarly for girls).

FIGURE XVII: Cohort Specific Predictions and Actual Outcomes



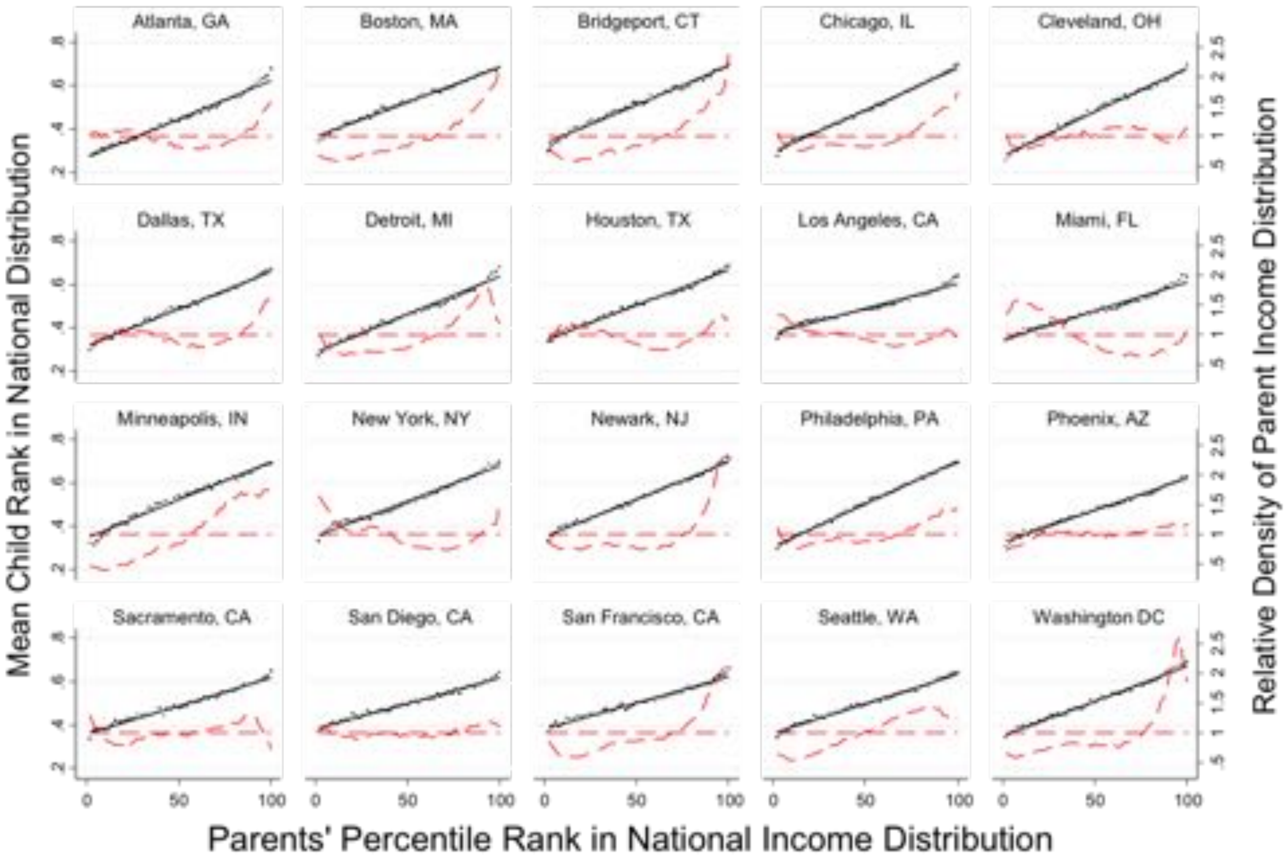

Notes: This figure shows that cohort specific predictions are more relevant for child outcomes than predictions using nearby cohorts. The figure uses the sample of movers. Each point is a coefficient from a regression of child income rank against cohort specific predictions. The series in circles plots the coefficient on place effects estimated, which is a cohort specific analog of the slope reported in Figure XIIIb (for age $\leq 23$). The series in triangles plots the coefficient on the difference (between the destination and the origin) in expected child income rank based on stayers. The regressions also control for the slope in Figure XIIIb for age $>23$, the expected child income rank in their origin, time of move, and indicators for missing data.

FIGURE XVIII: Impact of Moving to a Different Area on Teen Labor



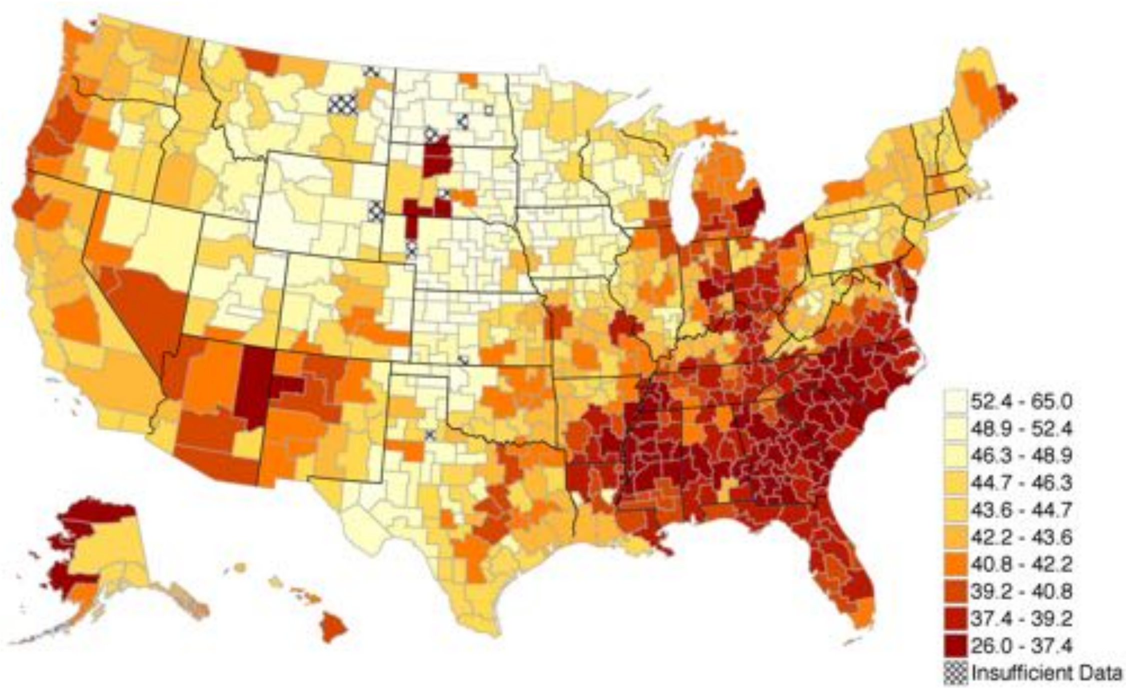

Notes: The bottom panel shows the effect on teen labor of moving to a better city on child outcome by age at which the move takes place.

APPENDIX FIGURE I: Rank-Rank Relationships and Relative Income Density in the 20 Largest Commuting Zones



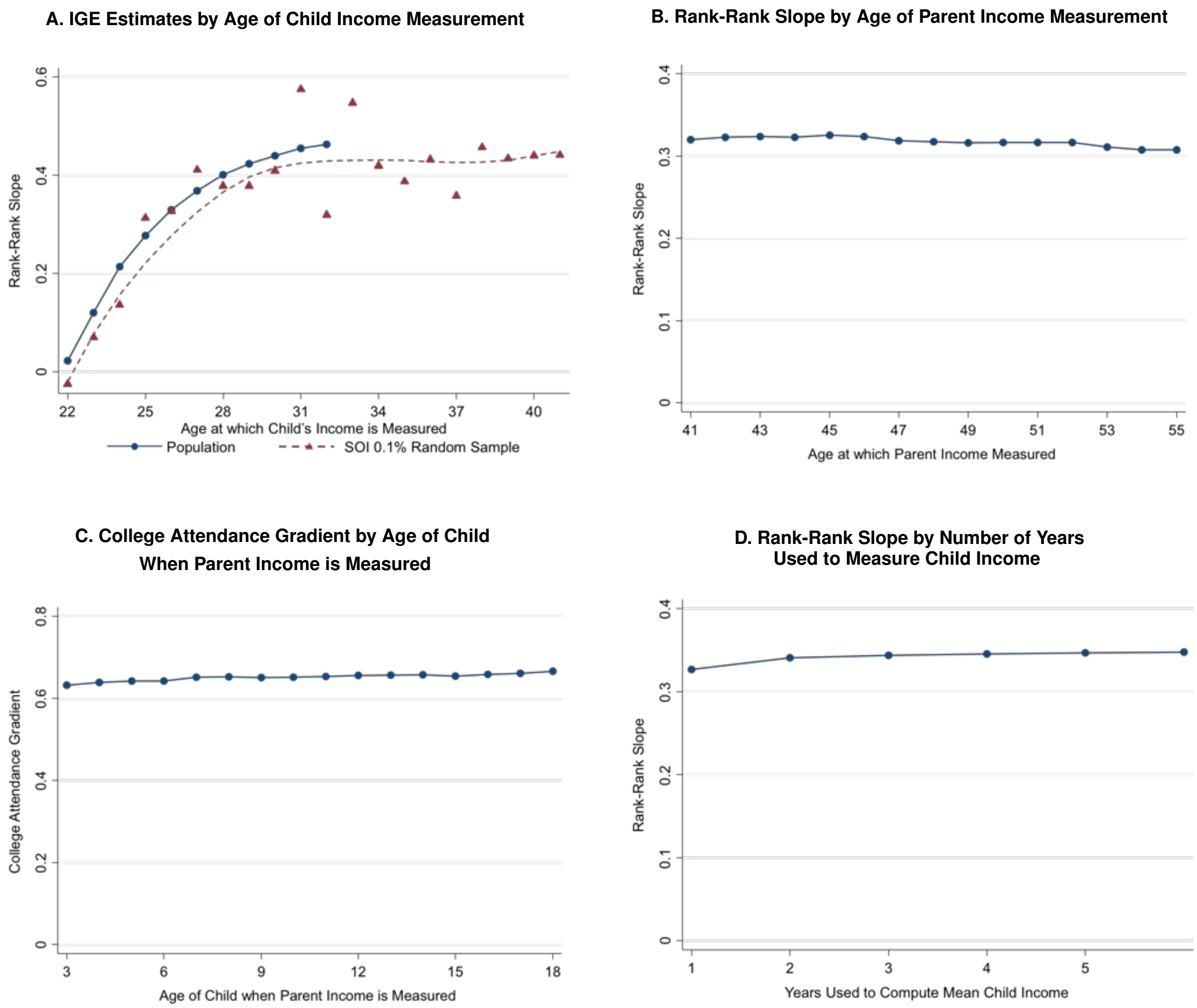

Notes: The figure depicts the rank-rank relationship and the relative parents' income distribution for the 20 largest CZs according to populations in the 2000 Census. The graphs are based on the core sample of all children born in 1980-1 who are current U.S. citizens and can be matched to parents through tax return data (see Table 1). In each CZ we group children into fifty bins according to their parents national income rank (the $x$-axis). Each of the fifty bins includes two percentiles. We calculate the mean child income rank in each bin in a black curve (left $y$-axis). We also plot the OLS linear fit to the binned data as a black line. The solid red curve shows the share of parents in each bin relative to the share in the national distribution (right y-axis). The red curve averages to one (denoted by the horizontal dashed line in each panel) in each city. The figure shows that the rank-rank linear fit is remarkably robust across cities, in spite of large differences in the local parental income distributions, which justifies using national ranks for estimating area based mobility measures.

APPENDIX FIGURE II: Absolute Upward Mobility 1980-82 and 1980-85 Cohorts




Notes: The figure maps Absolute Upward Mobility by CZ. For the 709 CZs that have at least 250 children in the 1980-82 cohorts, the Absolute Mobility Measure is the same as in Figure VIa. For a further 22 CZs that have fewer than 250 children in the 1980-82 cohorts, but at least 250 children in the 1980-85 cohorts, we plot Absolute Upward Mobility by CZ computed on the 1980-85 cohorts sample - the details of the computation are equivalent to those describe for Figure VIa.

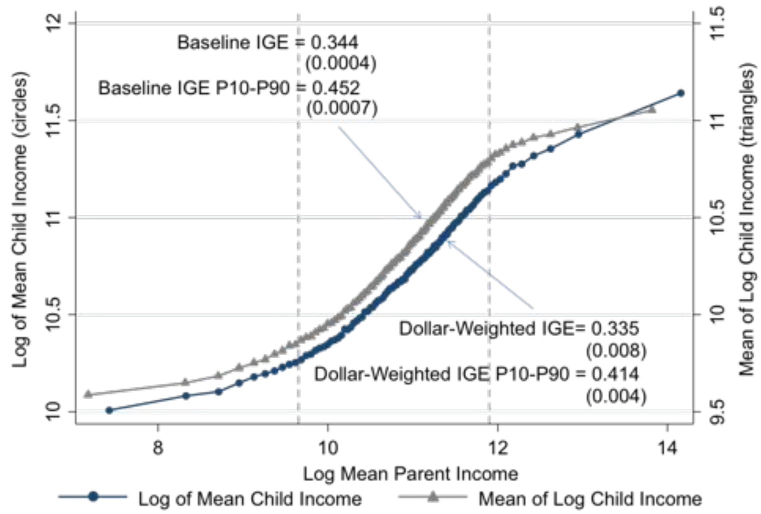
APPENDIX FIGURE III: Robustness of IGE Rank-Rank



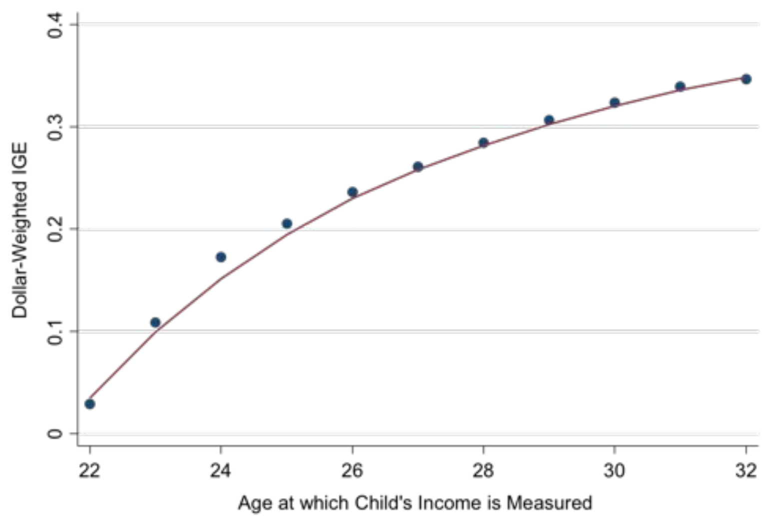

Notes: This figure evaluates the robustness of intergenerational mobility measures to lifecycle and attenuation bias. Panel A evaluates the robustness of the IGE to changes in the age at which child income is measured. Panel B evaluates the robustness of the rank-rank slope to changes in the age at which parent income is measured. Panel C evaluates the robustness of the college attendance gradient to the age of the child when parent income is measured. Panel D evaluates the robustness of the rank-rank slope to the number of years used to measure the child's income. In Panel A, we estimate the log-log IGE (excluding children with zero income), varying the age at which child income is measured. We restrict the sample to parents with income between the 10th and 90th percentile when estimating the IGE, as shown in Figure Ib. We measure child income in 2011-12 and analyze how the IGE varies across birth cohorts, as in Figure IIIa; see notes to that figure for further details. In Panel B, each point shows the slope coefficient from an OLS regression of child income rank on parent income rank (as in Figure IIa), using the core sample and varying the age at which parent income rank is measured. The first point measures parent income in 1996, when the mean age of parents is 41. The last point measures income in 2010, when parents are 55. Panel C reproduces Appendix Figure 2b from Chetty et al. (2014). In this figure, each point shows the slope coefficient from an OLS regression of an indicator for the child attending college at age 19 on parent income rank (similar to Figure IVa), varying the year in which parent income rank is measured from 1996 to 2011. In this series, we use data from the 1993 birth cohort, which allows us to analyze parent income starting when children are 3 years old in 1996. We list the age of the child on the x axis to evaluate whether the gradient differs when children are young (although parent age is of course also rising in lockstep). In Panel D, each point shows the slope coefficient from the same rank-rank regression as in Panel B using the core sample, but here we always use a five-year (1996-2000) mean to measure parent income and vary the number of years used to compute mean child income. The point for one year measures child income in 2012 only. The point for two years uses mean child income in 2011-12. We continue adding data for prior years; the 6th point uses mean income in years 2007-2012.

APPENDIX FIGURE IV: Dollar-Weighted vs. Traditional IGE Estimates

**A. Log of Mean Child Income vs. Mean of Log Child Income**

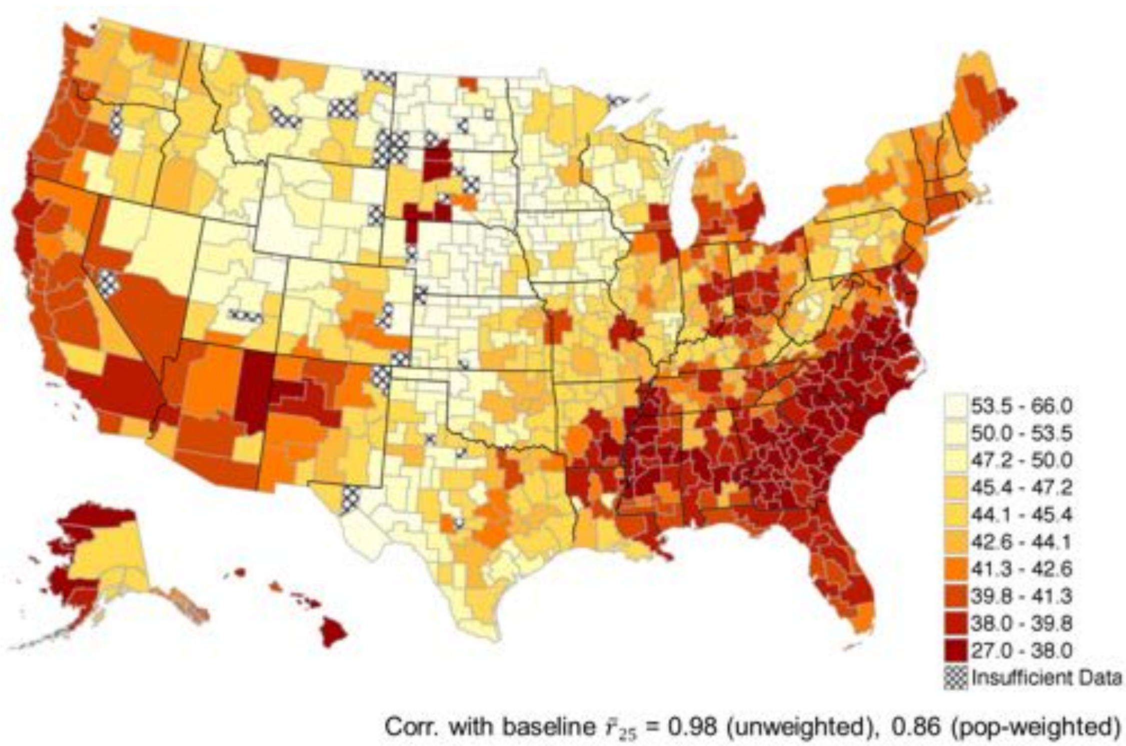



**B. Dollar-Weighted IGE by Age of Child Income Measurement**



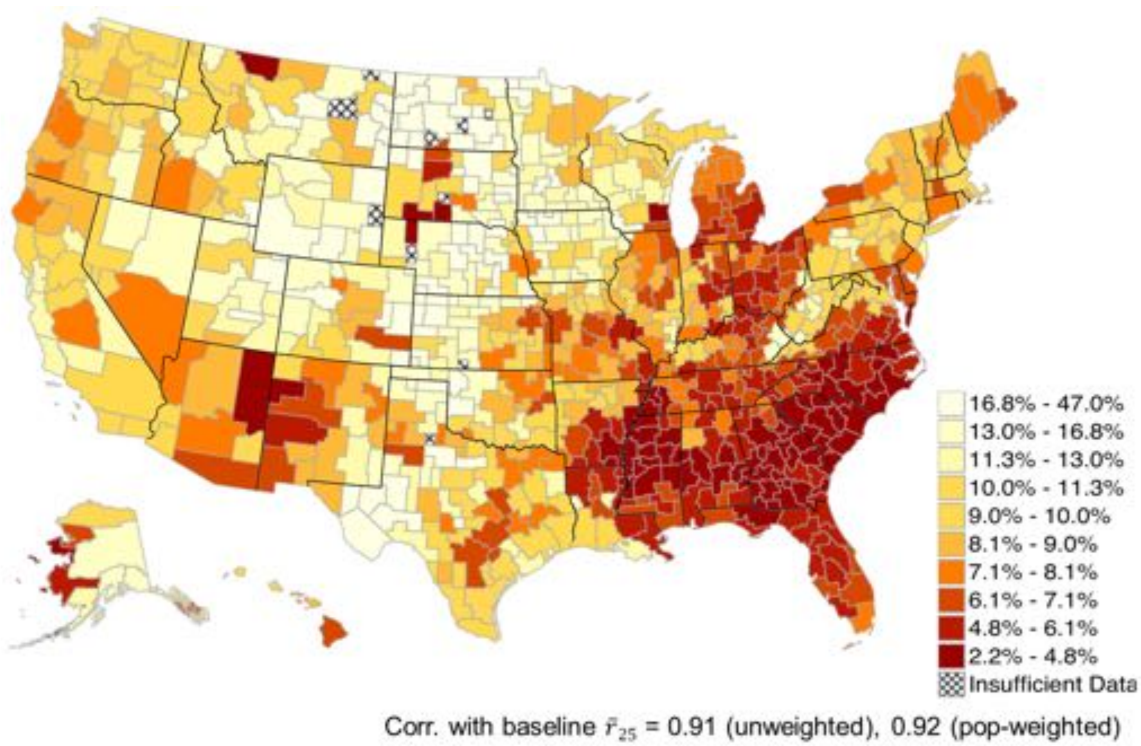

Notes: This figure compares dollar-weighted (Mitnik et al. 2014) and traditional IGE estimates. Panel A is based on the core sample (1980-82 birth cohorts) and baseline family income definitions for parents and children. The series in circles (left axis) plots log of mean child income against log of mean parent income. The series is constructed by taking the logs of the points in Figure Ia; however, here we do not omit the top income bin. The slope coefficients, which correspond to the dollar-weighted IGE defined in Appendix C, and standard errors are estimated by OLS on the binned data. The series in triangles (right axis) reports the mean of log child income vs. the mean of log parent income (reproducing the series in Figure Ib). The slope coefficients and standard errors for the traditional IGE are estimated on the microdata. The dashed lines in Panel A show the 10th and 90th percentiles of the parent income distribution. Panel B shows how the dollar-weighted IGE varies with the age at which child income is measured. We estimate the dollar-weighted IGE by grouping parents into 100 bins based on their income rank and regressing the log of mean child income on the log of mean parent income across the 100 bins. The figure plots the slope from this regression vs. the age at which child income is measured. We measure child income in 2011-12 and analyze how the IGE varies across birth cohorts, as in Figure IIIa; see notes to that figure for further details. The first point corresponds to the children in the 1990 birth cohort, who are 21-22 when their incomes are measured in 2011-12 (denoted by age 22 on the figure). The last point corresponds to the 1980 cohort, who are 31-32 (denoted by 32) when their incomes are measured.

APPENDIX FIGURE V: Absolute Upward Mobility Controlling for Cost of Living



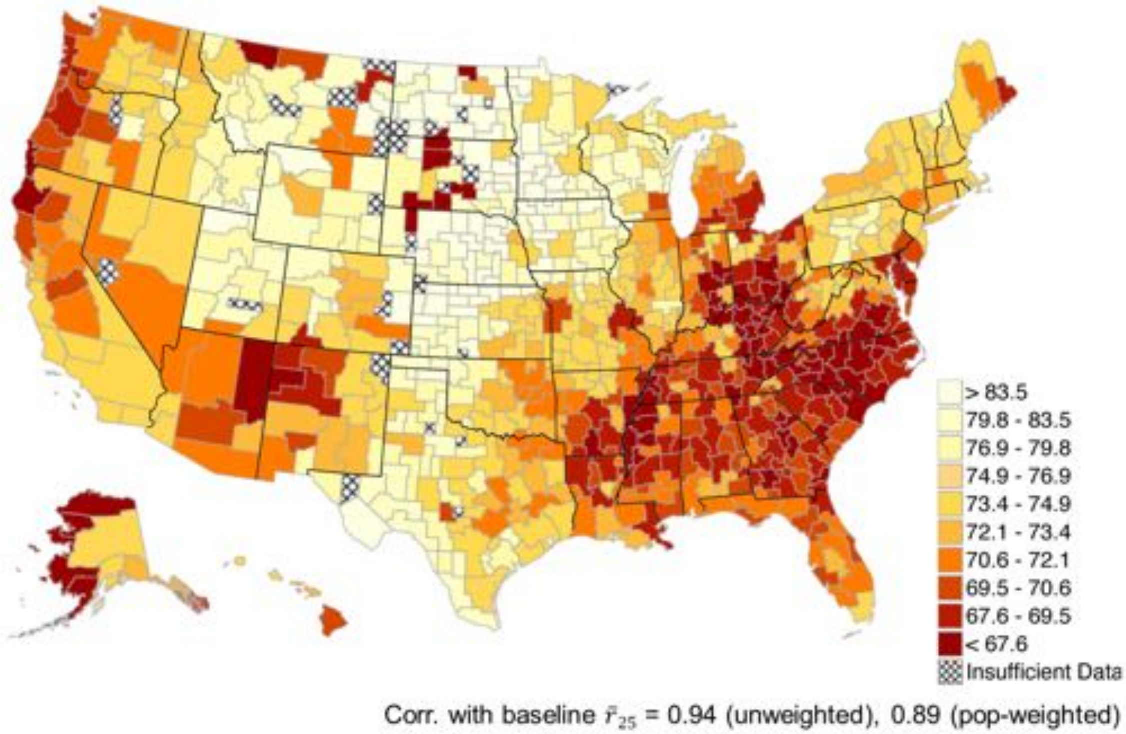

Notes: This figure maps the spatial distribution of upward mobility across CZs adjusting income for cost of living. To compute cost of living adjusted upward mobility we deflate nominal family income (for both children and parents) by a cost of living index computed from the ACCRA index. The map is very close to the baseline Absolute Upward Mobility map from Figure VIIa, showing that our mobility measures are robust to using real income or nominal income.

APPENDIX FIGURE VI: Probability of Reaching Top Quintile Starting from Bottom Quintile




Notes: This figure maps the spatial distribution of the probability that a child reaches the top quintile of the income distribution conditional on having parents in the bottom quintile of the income distribution. The map is very close to the baseline Absolute Upward Mobility map from Figure VIIa, showing that our mobility measures are robust to using real income or nominal income.

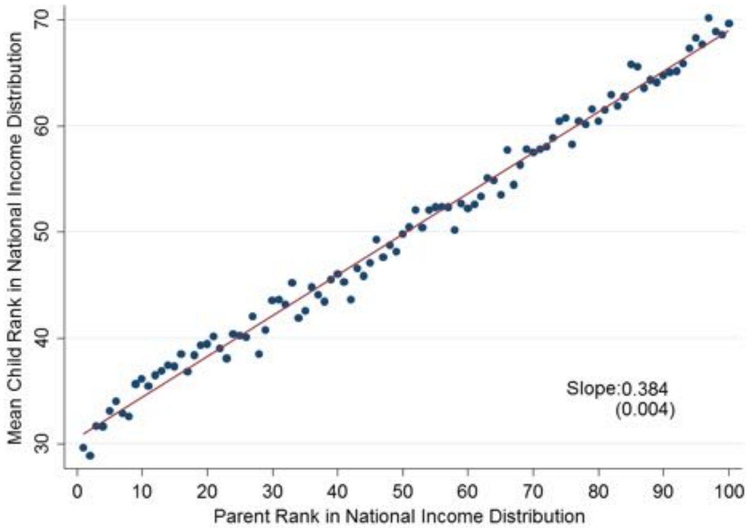
APPENDIX FIGURE VII: Fraction of Children Above Poverty Line Given Parents at 25th Percentile




Notes: This figure maps the fitted values at parent rank 25 from a regression of an indicator for child family income being above the poverty line on parent income rank. The map is constructed by grouping CZs into ten deciles and shading the areas so that lighter colors correspond to higher mobility. Areas with fewer that 250 children in the core sample, for which we have inadequate data to estimate mobility, are shaded with the cross-hatch pattern. We report the unweighted and population-weighted correlation coefficient across CZs between these mobility measures and the baseline measure in Figure VIIa.

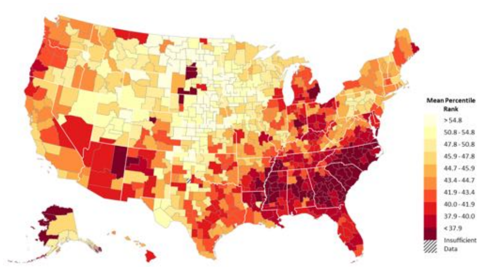
APPENDIX FIGURE VIII: Absolute Upward Mobility at Age 30 for Children of Stayers

**A. Mean Child Rank by Parent Rank in Chicago**

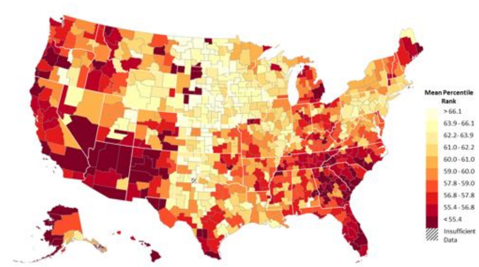



**B. Absolute Upward Mobility Based on Stayers from 1996-2012**

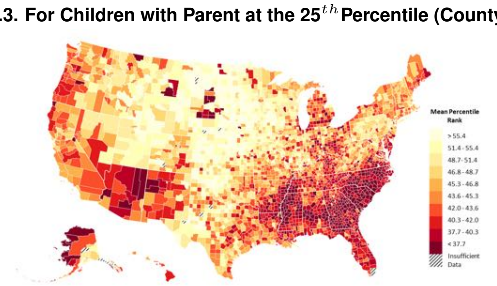
**B.1. For Children with Parent at the $25^{th}$ Percentile (CZ)**



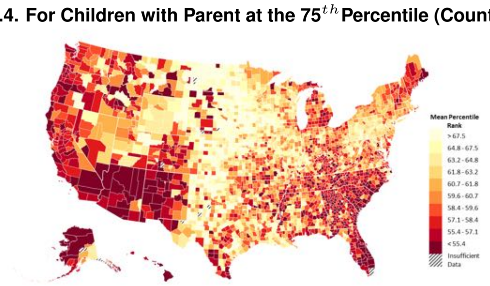
**B.2. For Children with Parent at the $75^{th}$ Percentile (CZ)**



**B.3. For Children with Parent at the $25^{th}$ Percentile (County)**



**B.4. For Children with Parent at the $75^{th}$ Percentile (County)**



Notes: Panel A replicates the series in triangles in Figure VI, but measures income ranks at age 30 and restricts the sample to children whose parents stayed in the same CZ from 1996-2012. Panel B replicates figure VIIa at the CZ and County level and at the $25^{th}$ and $75^{th}$ percentile, but estimates absolute upward mobility using income ranks at age 30 and restricts the sample to children whose parents stayed in the same CZ from 1996-2012.