www.sciencemag.org/cgi/content/full/science.aal4617/DC1

Supplementary Materials for

The fading American dream: Trends in absolute income mobility since 1940

Raj Chetty,* David Grusky,* Maximilian Hell, Nathaniel Hendren,* Robert Manduca, Jimmy Narang

*Corresponding author. Email: chetty@stanford.edu (R.C.); grusky@stanford.edu (D.G.); nhendren@fas.harvard.edu (N.H.)

Published 24 April 2017 on *Science* First Release
DOI: 10.1126/science.aal4617

This PDF file includes:

Materials and Methods

Figs. S1 to S12

Tables S1 to S4

References and Notes

Materials and Methods

This appendix contains three sections. Section I describes how we construct our samples and define the key variables used in the baseline specifications and sensitivity analyses. Section II presents a set of supplementary robustness checks that address various limitations of our data. Section III presents further detail on the methods underlying the counterfactual simulations and supplementary counterfactual results. Stata and Matlab code to reproduce all of the results in the paper from publicly available data can be downloaded from www.equality-of-opportunity.org.

Section I: Sample Construction and Variable Definitions

We construct estimates of absolute mobility by combining three sets of data. First, we construct a series of marginal income distributions for parents using the decadal Census data. Second, we construct a series of marginal income distributions for children using CPS data. Third, we construct the joint distribution of parent and child rank (the copula) using de-identified data from federal income tax returns.

In this section, we describe how we construct each of these three elements. We then discuss how we combine them to estimate absolute mobility in our baseline specification. Finally, we summarize supplementary data used for sensitivity analyses, such as alternative price deflators and data on taxes and transfers.

A. Parents' Income Distributions

Sample Construction

We obtain data on parents' incomes from the 1940 to 2000 U.S. Censuses, retrieved via the University of Minnesota's Integrated Public Use Microdata Series (IPUMS) (*42*). We use the 1% national random samples provided by IPUMS (except for the state-level analysis in Figure 4, where we use the 100% sample for 1940 and the 5% sample for 1980). We use the Form 1 Metro sample in 1970 and the Metro sample in 1980 (which are, contrary to their labels, full population samples) and the unweighted samples in 1990 and 2000.

To construct a sample that can be used without weights, we restrict the 1940 and 1950 Censuses to self-weighting sample-line persons and their families. Since the CPS data that we use to estimate children's incomes does not sample institutional group quarters, we render the Census and CPS samples comparable by excluding from the Census individuals residing in institutional group quarters (i.e., correctional and mental institutions, as well as institutions for the elderly and the handicapped) and residents of the military non-institutional group quarters. For every birth cohort from 1940 to 1984, we restrict our sample to parents who had children between the ages of 16 and 45 (inclusive). In two-parent households, we define the "representative parent" as the spouse with the higher total personal income, and use this parent's age when restricting the sample.

We follow the rules established by IPUMS to determine parent-child relationships, as well as whether and to whom a respondent is married (*43*). Children for whom no parent-child link can be made – that is, for whom both mother's and father's location in the household are not recorded – are dropped from the sample.

Baseline Income Definitions

Our baseline definition of family income varies across Census years because the income variables change across the Censuses. A complete list of the underlying IPUMS-USA variables used to construct our measures of parental income in each Census year is given in Table S3.

In the 1970 to 2000 Census years, we define parents' family income as the sum of spouses' pre-tax total personal income, minus income derived from Aid to Families with Dependent Children, General Assistance, and Supplemental Security Income.

Prior to 1970, data on income from public assistance programs is unavailable in the Census. Therefore, in the 1960 Census, parental income is defined simply as the sum of spouses' total personal income. In 1950, where personal income is only available for sample-line household heads, the sum of spouses' income cannot be computed. Here, we define parents' family income as the sum of the sample-line household head's total income, plus any income from other members of the primary family (including business, farm, and wage income, as well as from other, unspecified sources).

In the 1940 Census, only data on wages and salaries is available, as well as an indicator of whether respondents had more than $50 in non-wage, non-salary income. For 1940, we therefore impute average non-wage, non-salary income from the 1950 Census (adjusted for inflation) for each combination of occupation (using the detailed 1950 Census Bureau occupational classification), self-employed status, race (black, white, other), and the indicator for non-wage income above $50. Parents' family income in 1940 thus comprises the sum of spouses' wages, as well as their imputed non-wage income.

Inflation Adjustment

In our baseline specifications, we adjust for inflation using the Consumer Price Index Research Series (CPI-U-RS), available from the Bureau of Labor Statistics from 1977 onward. For all prior years, we follow the Census Bureau in applying the 1977 CPI-U-RS-to-CPI-U ratio to the CPI-U of previous years. Since income in Census and CPS refers to income earned in the previous calendar year, inflation adjustments are also applied to that calendar year. For instance, in the 1960 Census, income refers to income earned in 1959; our inflation adjustment thus pertains to 1959 U.S. dollars.

Construction of Marginal Distributions

As described in Section I of the text, we combine several Censuses to measure income between ages 25-35 (inclusive) for parents who had children in a given birth cohort *c*. In particular, we pool all individuals between the ages of 25 and 35 (at the time of the survey) in the available Census samples who had a child in cohort *c*. However, when drawing records from Censuses before year *c* (i.e., for parents who had children after age 35), we measure the incomes of *all* adults between ages 25-35 and assign them weight equivalent to the fraction of adults who have children in cohort *c* after age 35 (*44*). This is because we naturally cannot observe who will have children in the future.

For children born in 1940, we cannot secure income measurements from prior Censuses because income data were not collected prior to the 1940 Census. We therefore use income measurements from the 1940 Census itself for these older parents, pooling parents up to age 45 (*45*). Likewise, because we can only reach back to the 1940 Census

for the 1941-1949 birth cohorts, the income measurements for parents who had children in these earlier birth cohorts are also taken at slightly older ages on average relative to the measurements for parents who had children more recently. These age differences make it slightly more difficult for children of these early cohorts to exceed the income of their parents, reducing our estimate of the decline in absolute mobility.

We compute marginal income distributions for parents of children in each birth cohort by first estimating the cutoff values for the 100 percentile ranks and then calculating mean incomes within each percentile. We exclude parents with zero income when estimating the parental marginal income distribution. Parents with zero income are reintroduced in the final step of our absolute mobility calculations, described in Subsection D below.

B. Children's Income Distributions

Sample Construction

We obtain data on children's incomes from the 1970-2014 Annual Social and Economic Supplements of the Current Population Surveys (CPS-ASEC). We include only respondents who are 30 years old. We exclude all respondents who reported a birthplace outside of the United States starting in 1994 (information on birthplace is unavailable prior to 1994).

Baseline Income Definitions

Children's income is defined analogously to parents' family income, namely as the sum of spouses' total personal income minus income from welfare and Supplemental

Security Income. Table S4 lists the variables in the IPUMS-CPS that we use to construct our measures of children's income.

To account for the different thresholds used to top code income across different years of the CPS-ASEC, we use the Census Bureau's income component rank proximity swap values for 1976-2010 (which are constructed using restricted CPS data that are not top-coded) (*46*). We apply this procedure to all income components separately (such as wages and business income), and then sum them to obtain total personal income.

Construction of Marginal Distributions

To construct marginal income distributions for each birth cohort, we again estimate the cutoff values for every percentile and then calculate mean incomes within each percentile. We account for the CPS's stratified sampling scheme by using person-level sampling weights provided for use with ASEC when estimating the percentile cutoff values.

Our income estimates from our CPS-ASEC samples closely match the trends in median individual income by gender published in Table P-8 of the Census Bureau's Historical Income Tables based on CPS data (see Figure S11). For purposes of this comparison, we extend our sample to include all individuals aged 25-34 and exclude individuals with no reported individual income.

C. Copula

The copula we use is the 100 x 100 percentile transition matrix constructed by Chetty et al. (*12*; Online Data Table 1). We briefly summarize the methodology used to construct this copula below.

Sample Construction

The sample consists of the set of children in Social Security Administration population records who are born between 1980-1982 and are U.S. citizens as of 2013. For each child, we then define the parent(s) as the first person(s) who claim the child as a dependent on a 1040 tax form. Ninety percent of children born between 1980 and 1982 can be linked to parents based on dependent claiming. We limit the sample to children who can be linked to parents. This definition of "parents" – based on who claims a child as a dependent – differs from the biological definition of parents used in the CPS and Census. Using birth certificate data to link parents to children yields very similar estimates of the copula (not reported). The population in the tax data also differs slightly from that in the CPS and Census because it includes institutionalized individuals.

Income Definitions

We define both parents' and children's family income in the tax data as follows. In years where the individual files a tax return, we define family income as Adjusted Gross Income (as reported on the 1040 tax return) plus tax-exempt interest income and the non-taxable portion of Social Security and Disability benefits. In years where the individual does not file a tax return, we define family income as the sum of wage earnings (reported on form W-2), unemployment benefits (reported on form 1099-G), and gross social

security and disability benefits (reported on form SSA-1099). For non-filers, we cannot include the spouse's income. However, the vast majority of non-filers of working age are single (*47*). In years where the individual has no tax return and no information returns, family income is coded as zero. Importantly, these observations are true zeros rather than missing data. Because the dataset includes all tax records, we know that these individuals have 0 taxable income.

We average parents' family income over the five years from 1996 to 2000 (the earliest years available in the sample) to obtain a proxy for parent lifetime income that is less affected by transitory fluctuations. However, Chetty et al. (*12*; Appendix Figure IID) show that using annual income measures yields very similar estimates of rank distributions because the degree of transitory variance in income ranks is small in tax records. We define child family income as mean income over the last two years in the data (2011 and 2012), when children in the 1980-82 cohorts are in their early thirties.

Construction of Copula

We exclude parents with zero or negative income when constructing the copula because parents with no earnings typically do not file a tax return and hence cannot be linked to their children based on dependent claiming. After excluding parents with zero income, we assign parents percentile ranks based on their incomes relative to other parents in the sample. Children are assigned percentile ranks based on their incomes relative to other children in the same birth cohort. We estimate the copula non-parametrically as a 100×100 matrix that gives the joint probability of each child and parent percentile rank pair.

For simplicity, we use the same copula when analyzing subgroups (by gender and state). Using gender-specific or state-specific copulas yields very similar estimates of mean absolute mobility by cohort (not reported). We also use the same copula when measuring income at age 40, motivated by evidence that distribution of income ranks is stable between the ages of 30 and 60 (*12*).

Tax records with sufficiently large samples sizes for constructing the copula are only available starting with the 1980 cohort. The 0.1% Statistics of Income sample used by (*15*) is adequate to assess the stability of the copula using statistics such as rank-rank correlations and quintile probabilities, but it is not sufficiently large to directly estimate the 100 x 100 percentile copula for each birth cohort from 1971-84. This is why we use the 1980 copula estimated from the population tax data for all cohorts.

Prior to the 1971 cohort, we use a bounding procedure to estimate the maximum and minimum feasible rates of upward mobility. The bounds on absolute mobility are narrow for early cohorts but widen considerably in recent cohorts. The copulas for the 1980 cohort used to produce the upper and lower bounds in Figure 2A are displayed in Figure S1. The copula that generates the upper bound concentrates mass just below the 1980 curve shown in Figure 2D, while the copula that generates the lower bound concentrates mass just above that curve.

D. Constructing Absolute Mobility

We combine the copula and the marginal income distributions for each birth cohort to calculate the fraction of children who earn as much or more than their parents at each parental income percentile. The mean absolute mobility for a given cohort is simply the

average of the rates of absolute mobility across all parental income levels. We include parents with zero income when computing these cohort-level averages, noting that children whose parents have zero income always earn at least as much as their parents. Formally, we calculate mean absolute mobility in cohort *c* as

$$A_c = z_c + (1 - z_c)A_{c \mid Par\_Inc > 0}, \qquad \text{(S1)}$$

where z_c is the fraction of parents with zero income in cohort *c* and $A_{c \mid Par\_Inc > 0}$ is mean absolute mobility for positive parental income (computed as an unweighted mean of absolute mobility across percentiles).

E. Variable Definitions for Sensitivity and Heterogeneity Analysis

This subsection defines the variables used for the sensitivity and heterogeneity analysis in Section IV of the paper.

Alternative Price Deflators

We obtain additional deflators (PCEPI, PPI, GDP Deflator, CPI-U) from the Federal Reserve Economic Data (FRED) database from the Federal Reserve Bank of St. Louis.

Taxes and Transfers

We estimate taxes using the NBER TAXSIM model (*41*). TAXSIM provides federal tax estimates starting in 1960. We use it to estimate federal tax liability after credits for children in all cohorts and for parents in 1960 and thereafter. To estimate taxes for parents prior to 1960, we use data on federal marginal tax rates and exemptions from (*27*).

We compute taxes in TAXSIM using the following variables: year, marital status, age of the primary and secondary taxpayers, wages and salary income (replicating the definitions in our baseline income specification), and number of dependents. We use the output variable FIITAX, the federal income tax liability after credits. When using marginal tax rates (prior to 1960), we determine exemptions based on marital status and the number of dependents.

We use two sources of data to measure transfers. First, we use the CPS and Census to measure the value of cash transfers from welfare programs and Supplemental Security Income. In particular, we add in the variables *incwelfr* and *incssi* in IPUMS-CPS, and incwelfr and incsupp in IPUMS-USA. We are able to measure these transfers for children in all years and for parents from 1970 onward.

Second, we include estimates of in-kind transfers from (*39*), which cover SNAP, WIC, housing assistance, the School Lunch Program, and LIHEAP. Data on in-kind transfers are only available from 1967 onward. Prior to 1967, these transfers are set to zero. (*39*) use CPS and administrative data to estimate mean transfers (with and without tax credits) by marital status, number of children, age categories, and family income decile for each year. We use these four criteria to bin our observations and then assign everyone in each bin the corresponding average transfer amount. Families with positive income are assigned the mean transfer excluding tax credits, and families with incomes of zero or less are assigned mean transfer including tax credits. This is because families with positive incomes have already had their tax-credits accounted for by TAXSIM (*48*).

Alternative Income Measures

We use the following alternative income definitions for sensitivity analyses (Figure S6):

Total family income is defined as the sum of personal incomes of all co-residing members of the same primary family (e.g., siblings, parents, or any other relatives). In our baseline analysis, we use the sum of spouses' total personal income minus income from welfare after 1950; however, we rely on total family income to measure parents' income in the 1950 Census as spouses' total personal income is not reported. The total family income definition is consistent across all years starting with the 1950 Census.

Wage and salary income is defined as the sum of spouses' income from wages and salaries. In our baseline analysis, we use wage and salary income to measure incomes in the 1940 Census (supplemented by imputed non-wage, non-salary income) because measures of total family income and spousal income are not available. The wage and salary income measure is consistent across all years starting with the 1940 Census.

Section II. Additional Robustness Checks

In this section, we present a set of supplementary robustness checks that address various limitations of the data we use.

First, our baseline analysis measures parents' family income as the sum of spouses' total personal income in the 1960-1980 Censuses. However, the 1950 Census only reports total family income, while the 1940 Census includes only wages and salaries, forcing us to use different income definitions in these earlier years as discussed above. Figure S6 shows that the trend in absolute mobility is very similar if we use alternative income definitions that do not change across Censuses: the sum of the spouses' wage and salary

income only or total family income, defined as the sum of income earned by all co-residing members of the primary family.

Second, the CPS data does not record individuals' birthplace before 1994. As a result, our baseline series excludes immigrants starting with the 1964 cohort. To verify that this change in the treatment of immigrants does not affect our results, Figure S7 includes immigrants in the calculation of children's marginal income distributions for all cohorts. Absolute mobility is slightly lower when immigrants are included because immigrants tend to have lower earnings than natives on average, but the trends are similar to our baseline results.

Third, in our baseline analysis, we pool data across multiple Censuses to measure the incomes of all parents between the ages of 25 and 35. This procedure provides an imperfect measure of parents' incomes because it relies on the assumption that the income distribution of those who have children after age 35 is representative of the income distribution of the general population and because it does not account for mortality or changes in parents' marital status across Censuses. To assess the robustness of our findings to these concerns, we replicate our analysis using only a single Census to measure parents' incomes, restricting parents' age at childbirth to be between 25 and 35. Figure S8 shows that we obtain very similar results when we focus on this subsample of parents.

Finally, the baseline results combine data for parents from the Census with data from the CPS for children. The use of the CPS for children permits measurement of children's income in each birth cohort at exactly age 30, while the use of the Census for parents allows us to obtain data on parents' incomes back to 1940 (as the CPS began

collecting comprehensive income data only in 1967). To ensure that mixing income information from two different datasets does not produce bias, we estimate marginal income distributions using either the Census or the CPS for *both* parents and children. Figure S9 shows that we obtain very similar estimates of absolute mobility when we use data from only the Census or only the CPS for both parents and children for the cohorts where data are available (*49*).

Section III: Counterfactuals

This section provides further detail on the methodology used to construct the counterfactuals discussed in Section V of the text and presents an additional set of counterfactuals to assess the robustness of our conclusions.

A. Methods for Baseline Counterfactuals

Higher GDP Growth Scenario

To construct the higher growth counterfactual, we first calculate the ratio of income at each percentile q of the income distribution at age 30 for children in the 1980 birth cohort ($y^k_{q,1980}$) to GDP per working-age family in 2010 (G^O_{2010}). We normalize GDP by the number of working-age families to control for changes in GDP due to changes in the number of working-age adults. We measure G^O_{2010} using annualized real GDP data from FRED (https://fred.stlouisfed.org/series/GDPCA). The number of working-age families is calculated by summing the household weights of all "famunits" that contain at least one person aged 18-64 in the Census, excluding those living in group quarters (GQ = 3 or 4).

We then compute counterfactual GDP per working-age family in 2010 (G^C_{2010}) by applying 30 years of a 2.5% annual growth to the 1980 GDP per working-age family of $87,908. This gives a counterfactual GDP per family of G^C_{2010} =$184,393= $87,908×1.025^{30}$ in 2010, compared to the observed value of G^O_{2010} = $136,198. Finally we create the counterfactual incomes by multiplying the observed income-to-GDP ratios ($\pi^k_{q,1980} = y^k_{q,1980}/G^O_{2010}$) by the counterfactual GDP G^C_{2010}.

We use analogous methods to calculate absolute mobility under the alternative annual growth rates of 1-10% presented in Figure 5B.

More Broadly Shared Growth Scenario

To construct the more broadly shared growth counterfactual, we first calculate the ratio of income at each percentile of the income distribution at age 30 for children in the 1940 birth cohort ($y^k_{q,1940}$) to GDP per working-age family in 1970 (G^O_{1970}). We then multiply this ratio by the observed 2010 GDP per working-age family of G^O_{2010} = $136,198 to obtain a counterfactual income distribution for children in the 1980 birth cohort.

B. Robustness to Alternative Counterfactuals

Measuring Income at Older Ages

Our more broadly shared growth counterfactual reallocates income not just across different income groups but also across individuals of different ages. In this subsection, we assess whether this reallocation across ages affects our conclusion that a broader

distribution of growth across income groups would substantially increase absolute mobility.

To motivate the issue, note that by using the ratio of child incomes at age 30 to GDP per working-age family to characterize the income distribution, our counterfactuals combine three channels through which the allocation of GDP affects children's marginal income distributions. First, within the set of 30 year olds in our sample, the allocation of income has become more unequal over time. In 1970, the difference between the 90th and 10th percentile of the income distribution of 30 year olds was $70,011; this difference grew to $118,347 in 2010. Second, the total amount of GDP per working-age family that accrues to 30 year olds has declined. The average income of 30 year olds in our sample fell from 69% of GDP per working-age family in 1970 to 44% in 2010. Finally, the total amount of national income captured in the CPS and Census has declined with the rise of profits and the increase in top income shares, which are not fully recorded in surveys (*31, 32*). The ratio of total income in the CPS to total GDP declined from 73% in 1970 to 60% in 2010.

To understand the contributions of these three components to our counterfactuals under the broadly shared growth scenario, we first consider a counterfactual that uses the total income in the CPS (per working-age family) instead of GDP to measure G^{O}_{2010}. This lowers the estimated rate of absolute mobility from the baseline value of 80% to 72%. As expected, a broadly shared growth scenario that does not fully account for the rise of incomes not captured in the CPS generates a lower rate of absolute upward mobility.

Second, we consider a counterfactual that replaces GDP (G^{O}_{2010}) with the total amount of income that accrues to 30 year olds in the CPS. In this scenario, absolute

mobility would be 57%. This result shows that a significant portion of the increase in absolute mobility in our baseline more broadly shared growth counterfactual is driven by the fact that 30 year olds today earn a smaller fraction of GDP than in the past. This finding raises the potential concern that the effects of distributing income more equally on absolute mobility might differ if we measure incomes at older ages.

We evaluate this concern by repeating our counterfactuals, measuring incomes at age 40 instead of age 30. We construct counterfactuals for the 1970 cohort, the most recent decadal birth cohort for whom we can measure income at age 40. For the higher growth scenario, we use the same counterfactual level of GDP per working-age family in 2010 used for the age 30 counterfactuals, G^{C}_{2010} =\$184,393 (*50*). However, we multiply the observed income-to-GDP ratios for 40 year olds in 2010 ($\pi^{k}_{q,1970} = y^{k}_{q,1970}/G^{O}_{2010}$) by G^{C}_{2010} to create the counterfactual income distribution at age 40 for the 1970 cohort under higher GDP growth. For the more broadly shared growth scenario, we calculate income-to-GDP ratios using incomes and GDP in 1980, when the 1940 cohort was 40 years old. We then multiply these ratios by observed GDP per working-age family in 2010 (G^{O}_{2010}) to construct estimates of what the 1970 cohort would have earned at age 40 if GDP in 2010 were allocated more evenly.

Panel A of Figure S12 presents the results of these counterfactuals, along with the actual levels of absolute mobility observed at age 40 for the 1940 and 1970 birth cohorts. In the data, mean absolute mobility at age 40 fell from 86% for the 1940 cohort to 56% for the 1970 cohort. Our counterfactual analysis shows that mean absolute mobility for the 1970 cohort would be 68% under the higher growth counterfactual, closing 39% of the gap between the two cohorts. Mean absolute mobility would rise to 74% for the 1970

cohort under the more broadly shared growth counterfactual, closing 59% of the observed gap between the two cohorts. Hence, the qualitative conclusion that more broadly shared growth would have a substantial effect on absolute mobility is unaffected by measuring income at later ages. Intuitively, the effect of the changing age distribution of growth noted above is partly offset by the greater degree of inequality in incomes at older ages, which increases the impact of changing the income distribution.

Using Shares of GDP Growth Instead of Levels

In our baseline analysis, we construct counterfactual incomes by allocating GDP based on individuals' observed shares of the *level* of GDP at age 30. An equally reasonable alternative is to construct counterfactuals based on individuals' observed shares of GDP growth from birth to age 30. In this subsection, we assess whether using growth shares would affect our conclusions.

To construct counterfactual incomes under the higher growth scenario using growth shares, we first calculate the difference in income between children and parents at each percentile q for the 1980 cohort ($y^k_{q,1980} - y^P_{q,1980}$). We then calculate the change in GDP per working-age family from 1980 to 2010 ($G^O_{2010} - G^O_{1980}$). Dividing the difference in income at a given percentile by the change in GDP gives us the ratio of income to GDP growth at each percentile for the 1980 cohort. We then multiply these ratios by the counterfactual GDP per family growth of \$96,485 – the counterfactual GDP per working-age family of G^C_{2010} =\$184,393 minus observed 1980 GDP of \$87,908 – and add them to the 1980 parent incomes at each percentile to obtain counterfactual incomes for children.

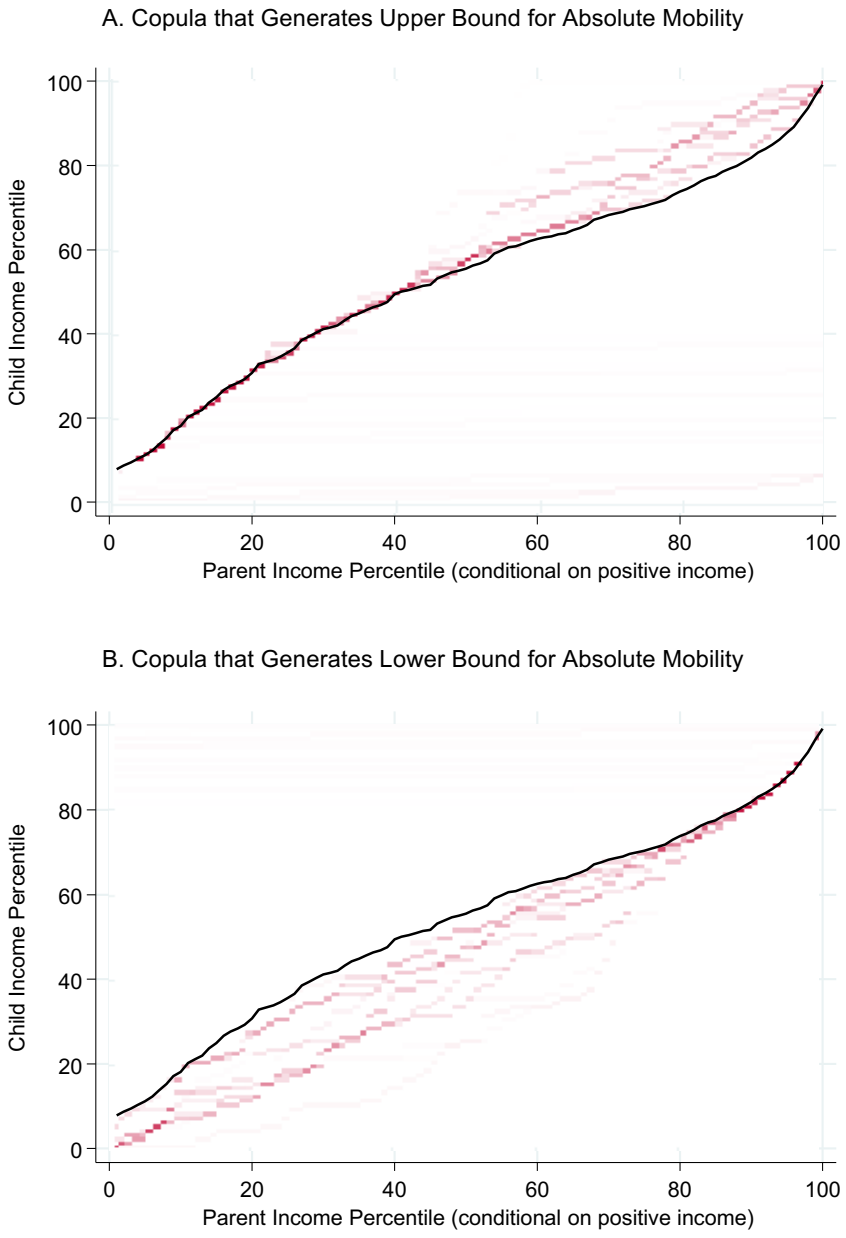
To construct counterfactual incomes under the more broadly shared growth scenario using growth shares, we first calculate the difference in parent versus child incomes at each percentile of the income distribution for the 1940 cohort ($y^{k}_{q,1940} - y^{P}_{q,1940}$). We then divide these differences by the increase in GDP per working-age family from 1940 to 1970 ($G^{O}_{1970} - G^{O}_{1940}$) to obtain the ratio of income to GDP growth at each percentile for the 1940 cohort. We then multiply these ratios by the observed change in GDP per working-age family from 1980-2010 of $48,291 ($136,198 in 2010 minus $87,908 in 1980) and add them to the 1980 parent incomes at each percentile to obtain counterfactual incomes for children.

The results of this alternative approach are presented in Panel B of Figure S12. We find an even larger impact of the broadly shared growth counterfactual relative to the high growth counterfactual than in our baseline counterfactuals. Under the broadly shared growth counterfactual, mean absolute mobility rises to 80%; under the higher growth counterfactual, mean absolute mobility *falls* to 47%. This is because many percentiles of the children's income distribution have fallen relative to their parents for the 1980 birth cohort. For these groups, allocating growth in accord with how it has been allocated between 1980-2010 (i.e., using negative growth shares) decreases their incomes further. Conversely, changing the distribution to the more equal shares of growth experienced by the 1940 cohort has very large effects.

In Panel C of Figure S12, we replicate the growth shares counterfactuals in Panel B, measuring incomes at age 40 for the 1970 cohort. These counterfactuals are constructed in the same way as above, except that they use income growth to GDP growth ratios for

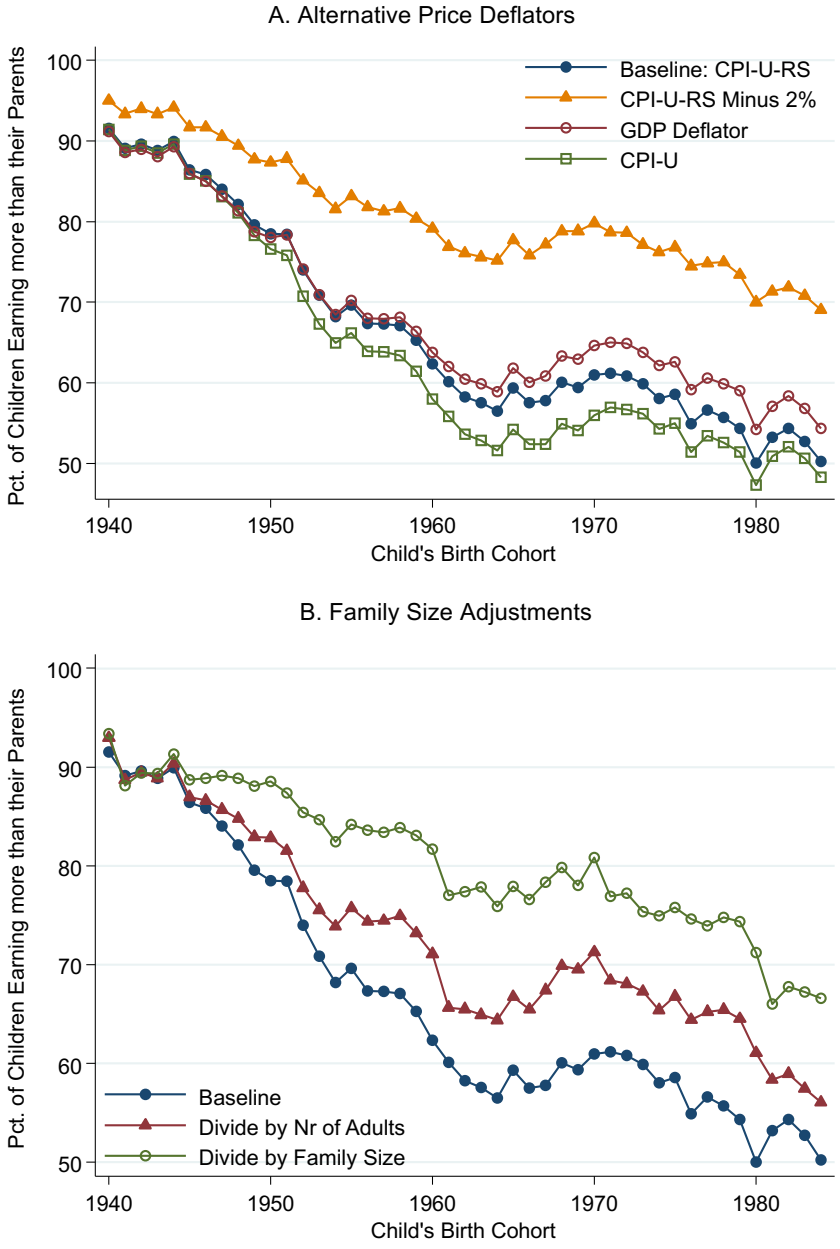
the years 1950-1980 rather than 1940-1970 in the more broadly shared growth counterfactual. The results at age 40 are very similar to those at age 30.

In sum, these alternative counterfactuals reinforce the conclusion that higher GDP growth itself cannot increase absolute mobility unless it is more broadly distributed.



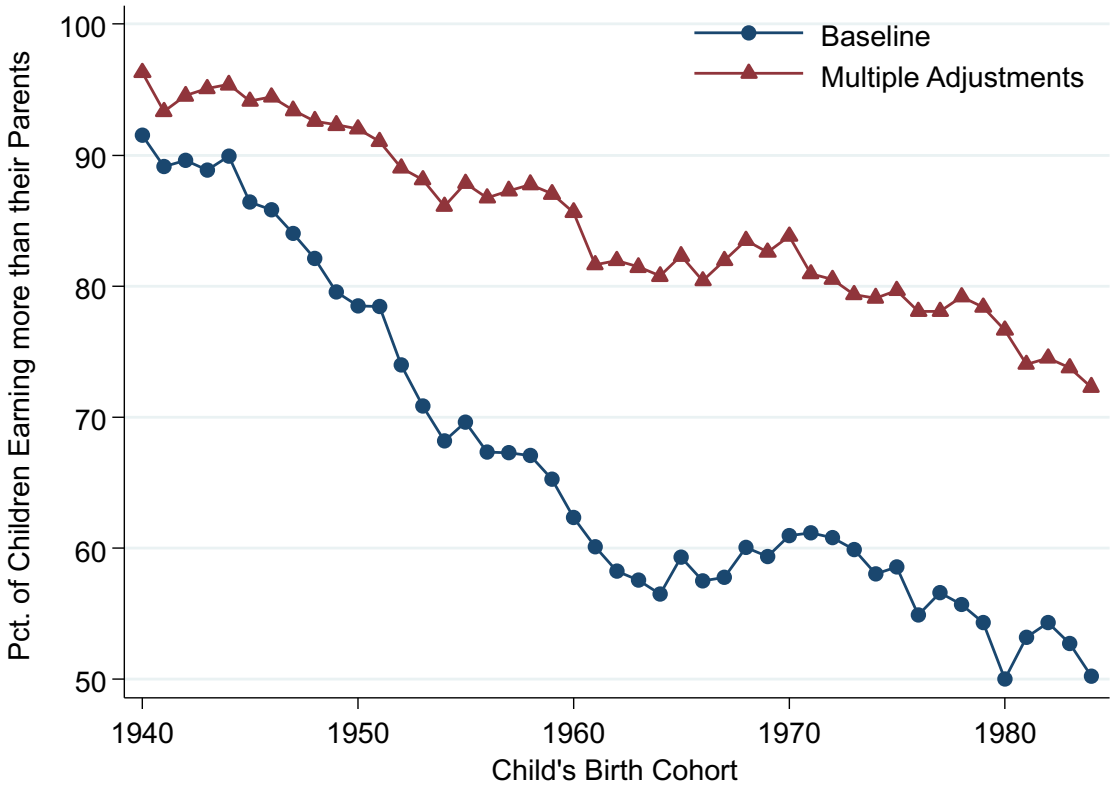
Notes: This figure depicts the copulas that generate the bounds on absolute mobility for the 1980 cohort in Figure 2A. Panel A presents the copula that generates the upper bound on absolute mobility, while Panel B presents the copula that generates the lower bound on absolute mobility. Darker shades represent cells with greater mass in the copula. The solid curve in both panels shows the rank that a child must reach in order to surpass the income of their parents by parental income percentile in the 1980 birth cohort, as in Figure 2D.

Figure S1. Copulas that Maximize and Minimize Absolute Mobility for 1980 Cohort



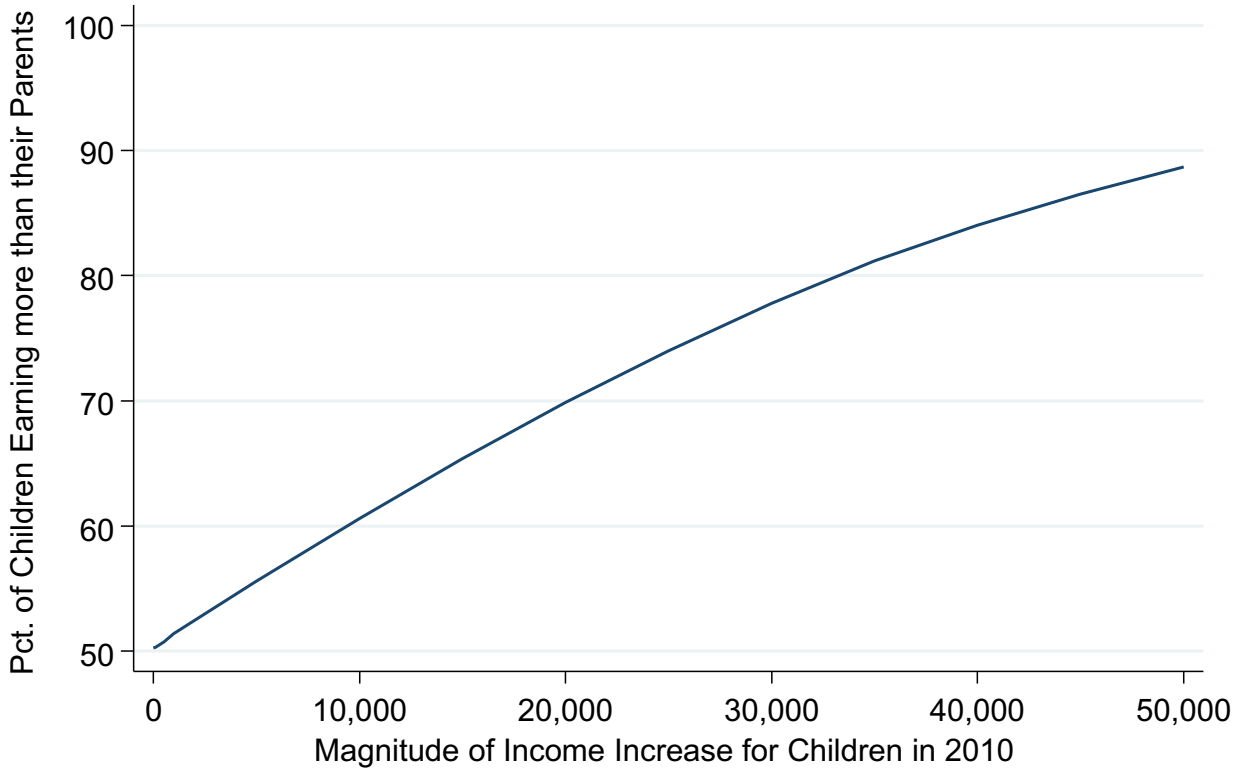
Notes: Panel A plots absolute mobility by birth cohort, replicating Figure 3A with alternatives to our baseline price deflator (the CPI-U-RS): the GDP deflator, the CPI-U, and a price index that subtracts 2% from the annual inflation rate implied by the CPI-U-RS. Panel B replicates Figure 3D using alternative adjustments for family size. We divide the baseline family income measures for both parents and children by either the total number of adults in the household (triangles) or by family size (open circles). The number of adults is defined as one plus an indicator for being married. In the CPS, family size is defined as the number of own children plus the number of spouses. In the Census, family size is defined as the number of own family members residing with each individual.

Figure S2. Alternative Price Deflators and Adjustments for Family Size



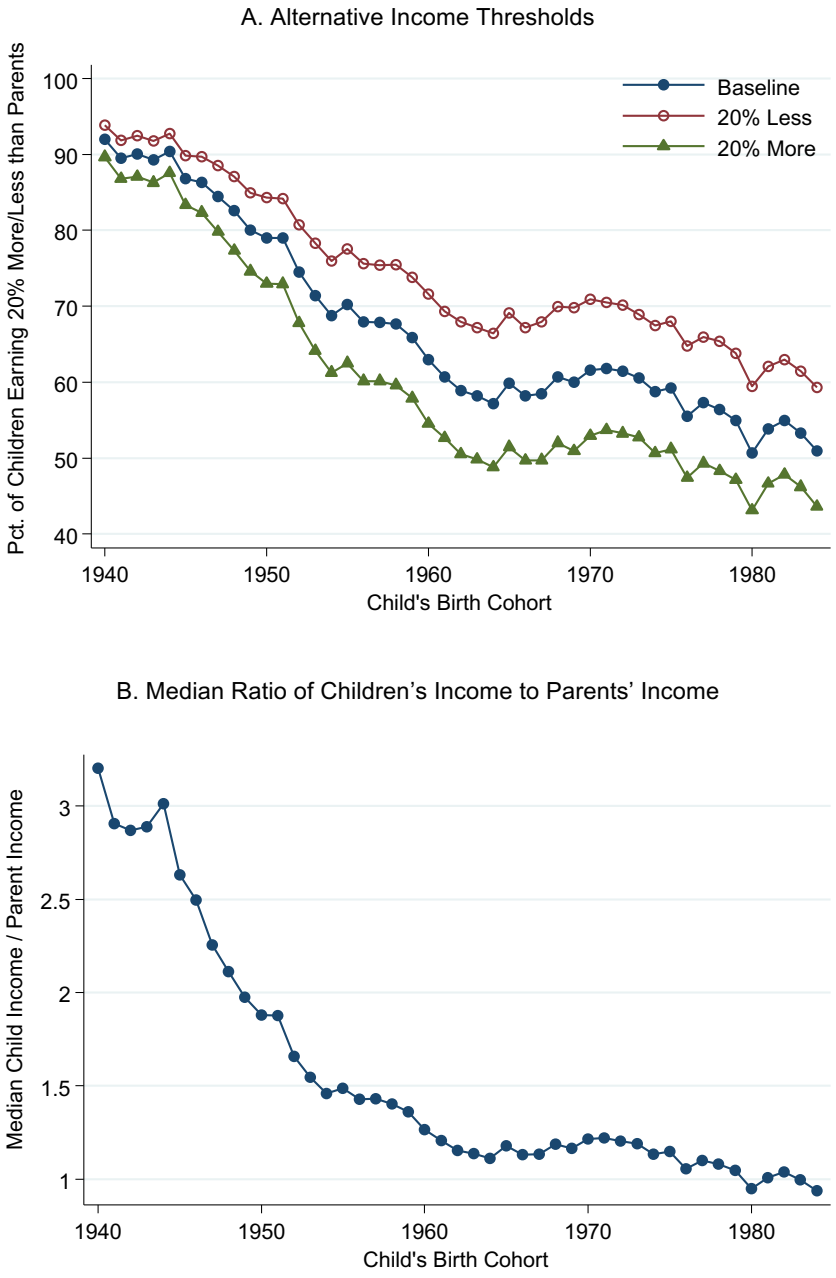
Notes: This figure plots absolute mobility by birth cohort, replicating the baseline series in Figure 1B after adjusting the baseline income definition in three ways: using the CPI-U-RS minus 0.8pp as the price deflator, including taxes and transfers, and adjusting for changes in family size by dividing family income by the square root of child and parent families.

Figure S3. Simultaneous Adjustment for Taxes and Transfers, Family Size, and Inflation



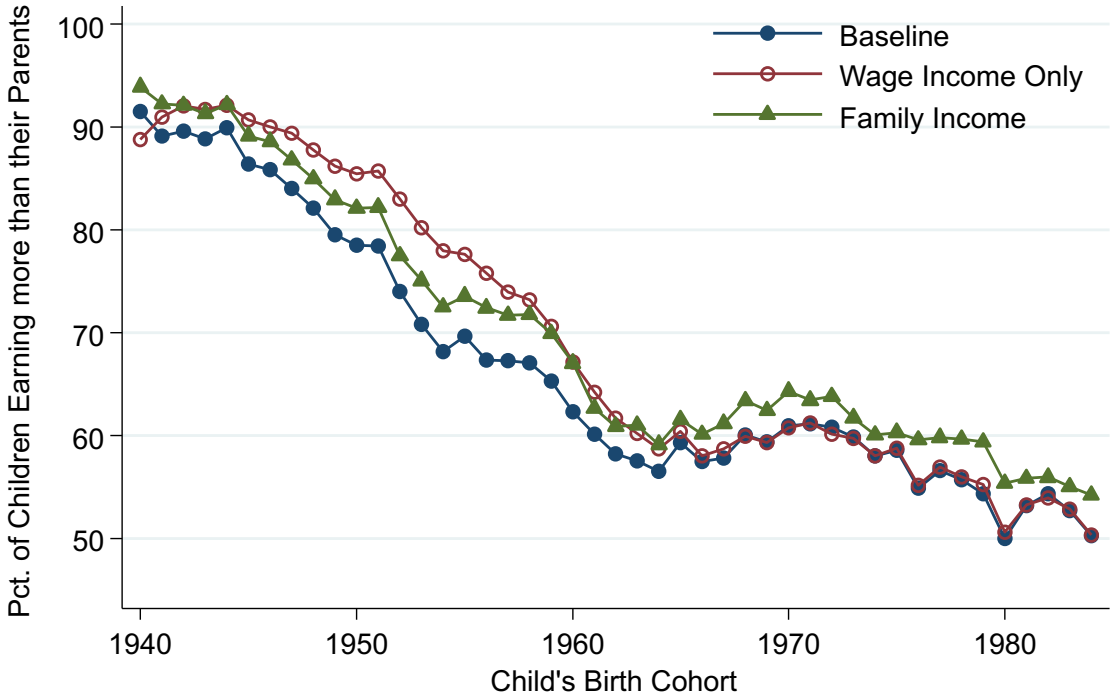
Notes: This figure recalculates absolute mobility for the 1984 birth after increasing each child's income in 2010 by fixed dollar amounts ranging from 0 to $50,000 (measured in real 2014 dollars). Aside from these increments to children's incomes, all other aspects of the specification are identical to the baseline.

Figure S4. Effects of Increasing Child Income on Absolute Mobility for 1984 Cohort



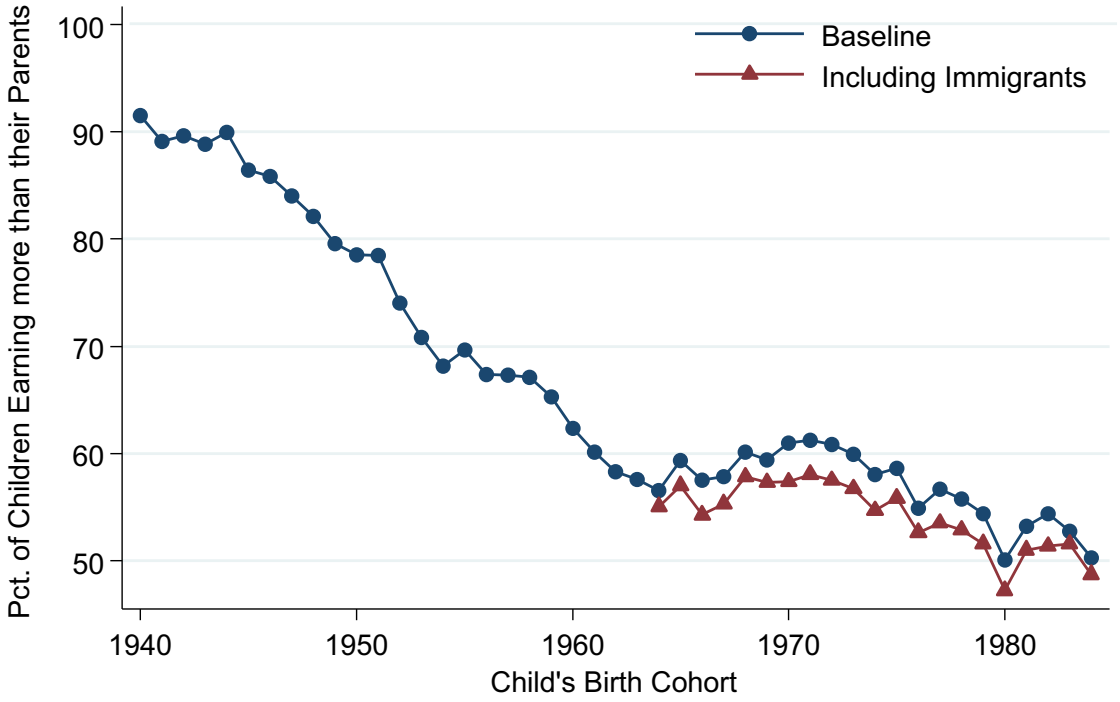
Notes: This figure shows estimates of absolute mobility by birth cohort using alternative measures of mobility. Panel A shows the fraction of children earning 20% more than their parents or 20% less than their parents. Panel B plots the median ratio of child to parent income. All other aspects of the absolute mobility calculations are identical to those used in the baseline specification.

Figure S5. Alternative Measures of Absolute Mobility



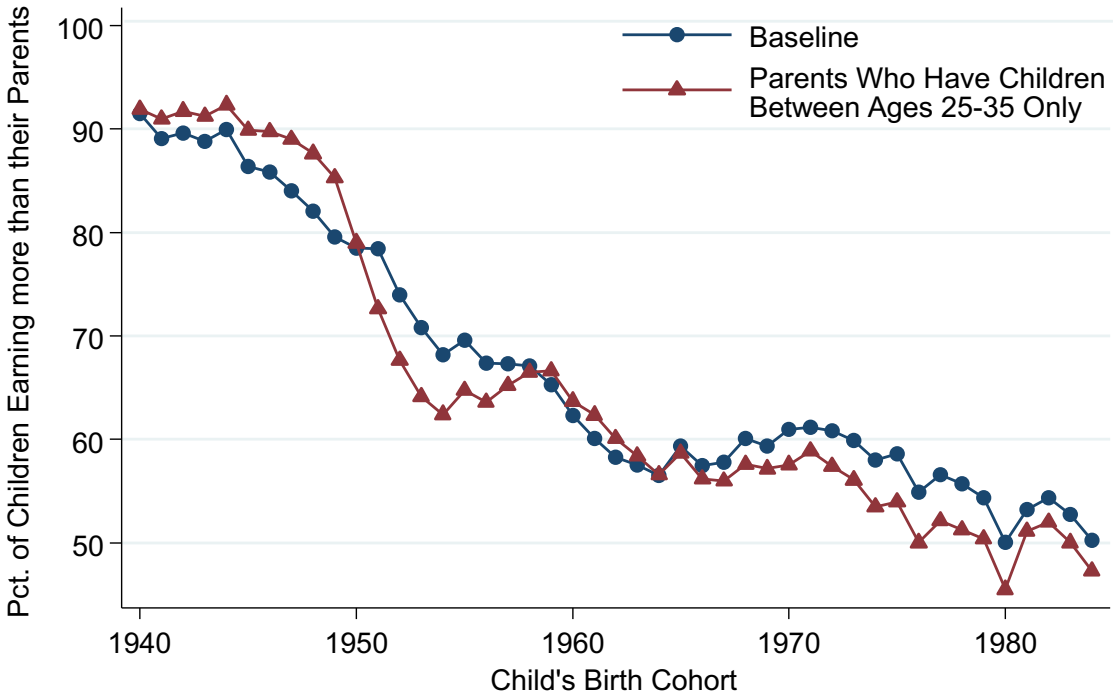
Notes: This figure plots absolute mobility by cohort, replicating Figure 1B using alternative income definitions for parents and children. Wage Income is computed as the sum of wage and salary income of the individual and spouse (if applicable). Family income is total income from all co-residing members of the primary family. The Supplemental Appendix provides further details on how these measures are defined. Aside from these changes to the income definition, all other aspects of the specification are identical to the baseline.

Figure S6. Alternative Income Definitions



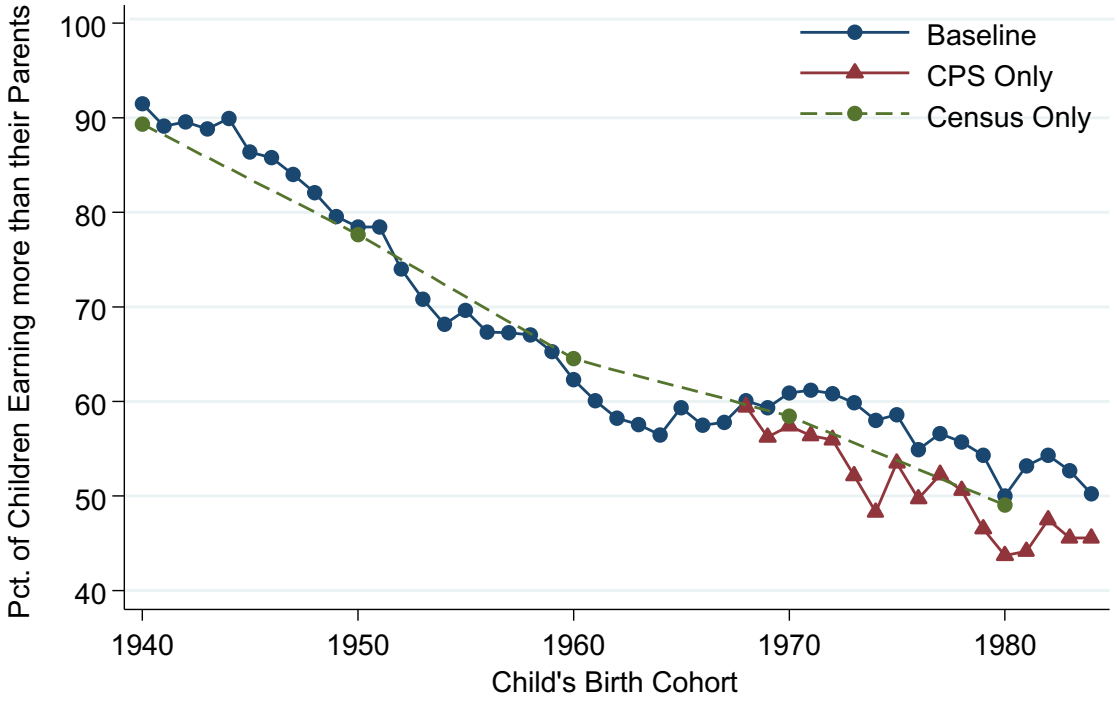
Notes: This figure plots absolute mobility by cohort, replicating Figure 1B including immigrants in the sample of children. The CPS-ASEC did not collect data on birthplace prior to 1994, so the 1964 cohort is the first cohort for which immigrants are excluded from our baseline sample.

Figure S7. Effect of Including Immigrants



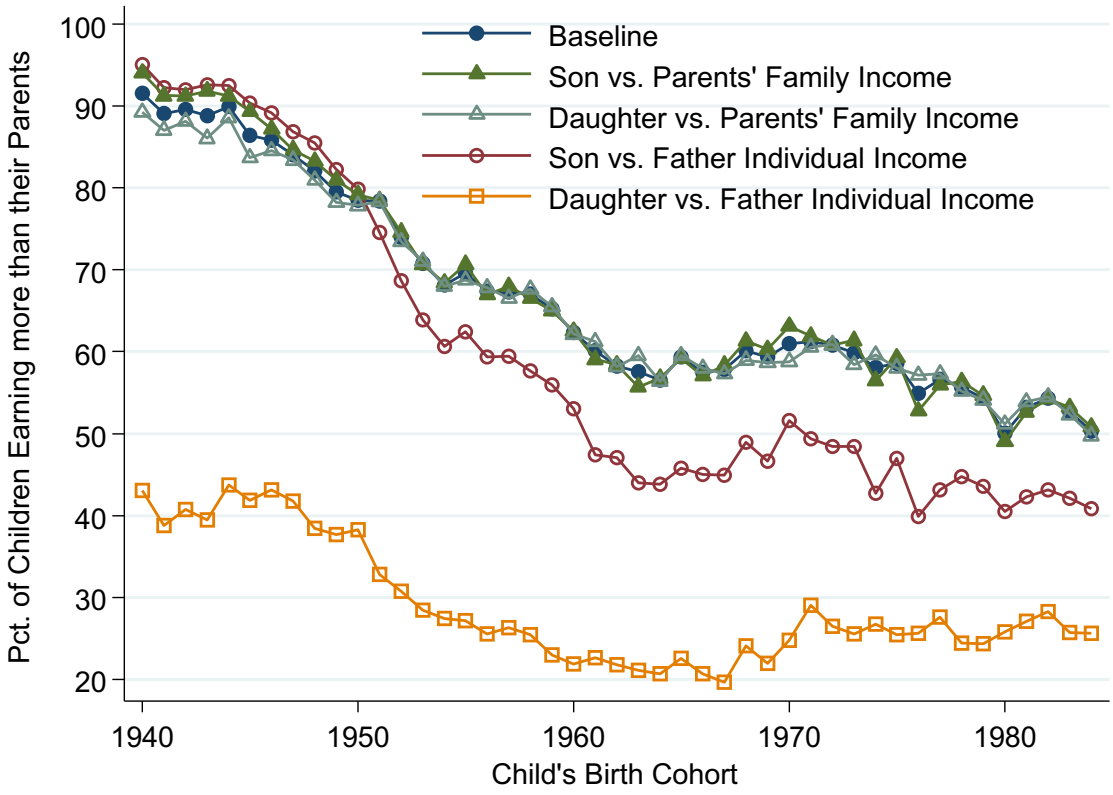
Notes: This figure replicates Figure 1B after restricting the sample to parents who have a child between ages 25-35, the ages at which we measure parents' incomes. All other aspects of the specification are identical to the baseline. The baseline estimates include all parents who have a child between ages 16-45 by pooling data across multiple Censuses.

Figure S8. Sensitivity to Parent Age at Child Birth



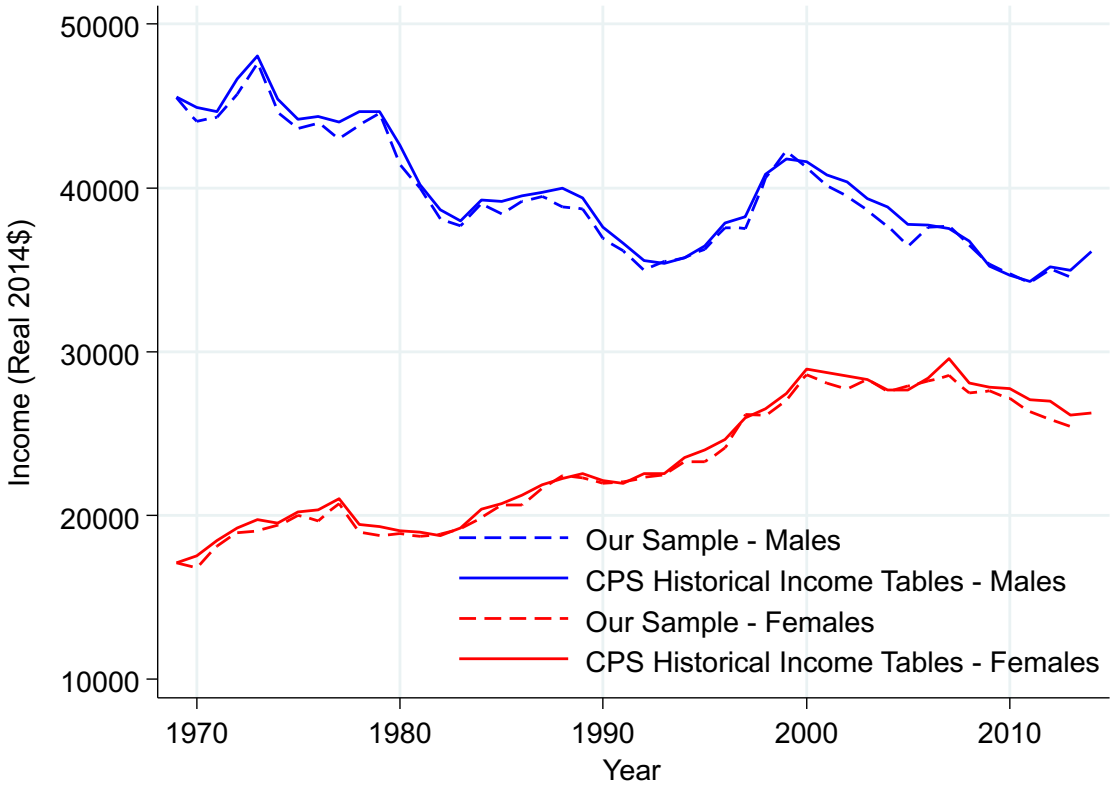
Notes: This figure plots absolute mobility by cohort, measuring both parents' and children's incomes using the same dataset rather than using annual CPS data for children and decadal Census data for parents as in our baseline specification. In the Census only series, parents' incomes are identical to the baseline, while children's income distributions are defined using total family income among all 30-year olds. In the CPS only series, children's incomes are identical to the baseline, while parents' income distributions are calculated using total family income for parents of newborns in families where the higher-earning parent is aged 25-35. The CPS only series therefore excludes parents who have children after age 35 or before age 25, as in Figure S8. The CPS only series begins in 1968 because consistent income definitions for parents are not readily available in prior years. All other aspects of the specifications in both series are identical to the baseline.

Figure S9. Alternative Data Sources for Marginal Income Distributions



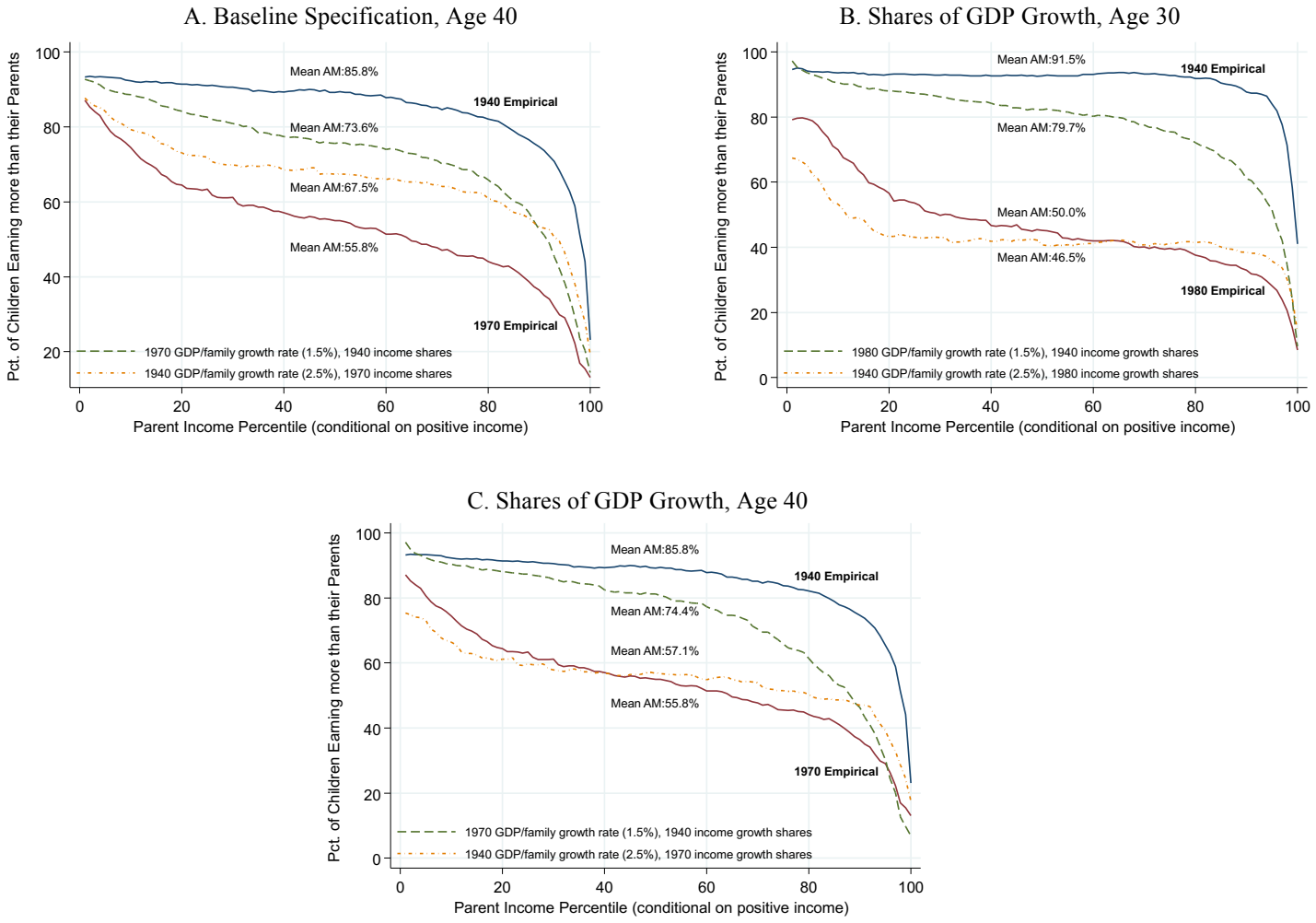
Notes: This figure plots absolute mobility by cohort for sons and daughters using individual income and family income (including spousal income). The series in solid triangles plots the fraction of sons whose family income exceeds their parents' family income, replicating Figure 1B for sons. Similarly, the series in hollow triangles plots the fraction of daughters whose family income exceeds their parents' family income. The series in circles plots the fraction of sons whose individual income exceeds their fathers' individual income, replicating the series in Figure 3D. The series in squares plots the fraction of daughters whose individual income exceeds their fathers' individual income.

Figure S10. Heterogeneity by Gender



Notes: This figure plots the median income of individuals aged 25-34 in the CPS as published by the Census Bureau (Historical Income Tables: People P-8) alongside our own estimates, constructed from the CPS-ASEC. Both series use total personal (individual) income, adjusting for inflation using CPI-U-RS. In contrast to our baseline marginal income distributions, we pool individuals from ages 25-34 and drop individuals with zero income for comparability with the published Census tables.

Figure S11. Median Incomes by Year, Individuals Aged 25-34



Notes: This figure presents the alternative counterfactual scenarios described in Section III of the Supplemental Appendix. Panel A replicates the counterfactuals in Figure 5A, measuring incomes at age 40 instead of age 30. We use the 1970 cohort instead of the 1980 cohort for the age 40 analyses as it is the most recent decadal cohort for which income at age 40 can be observed. Panel B reports results from GDP growth shares counterfactuals, in which counterfactual incomes for children in the 1980 cohort are constructed based on observed shares of GDP *growth* from birth to age 30 (1980-2010) rather than shares of GDP *levels* in 2010. Panel C replicates Panel B, measuring incomes at age 40 instead of age 30. In all panels, the dotted lines present the higher GDP growth counterfactuals, while the dashed lines present the more equal growth counterfactuals.

Figure S12. Alternative Counterfactuals

Table S1. Summary Statistics for Child and Parent Samples

Child's Birth Cohort	Children (CPS)				Parents (Census)		
	No. of Children	Weighted Count	Income at Age 30 ($)		No. of Families	Income Ages 25-35 ($)	
			Mean	Median		Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1940	1,614	2,256,476	57,159	53,512	9,990	18,835	17,836
1941	1,680	2,371,403	55,473	53,259	20,186	20,642	18,694
1942	1,745	2,652,364	56,587	53,708	21,106	21,280	19,322
1943	1,899	2,903,434	59,352	55,689	22,847	22,295	19,857
1944	1,843	2,901,957	62,069	57,792	23,252	22,651	19,857
1945	1,718	2,809,649	56,839	55,440	23,203	23,723	19,857
1946	1,706	2,718,989	56,448	52,430	23,562	24,614	20,065
1947	2,687	3,606,320	58,853	55,311	30,276	27,836	23,781
1948	2,560	3,583,373	58,909	54,886	31,256	29,448	25,961
1949	2,500	3,566,347	58,642	55,645	29,699	31,124	27,383
1950	2,990	3,590,742	59,857	55,605	28,767	32,968	29,517
1951	2,953	3,674,309	57,163	54,729	20,952	32,051	28,259
1952	2,703	3,860,927	54,891	51,845	22,888	34,244	30,867
1953	2,730	3,970,066	53,765	49,012	24,561	35,363	32,606
1954	2,650	3,901,364	52,739	48,136	26,423	36,536	34,345
1955	2,817	4,153,580	55,118	50,759	28,574	37,610	35,562
1956	2,827	4,373,260	56,333	49,882	29,868	39,065	35,918
1957	2,805	4,432,183	59,033	51,644	31,813	39,776	36,629
1958	2,825	4,517,124	58,266	52,226	33,631	41,304	38,052
1959	2,528	4,412,732	58,809	51,170	34,691	42,177	38,407
1960	2,680	4,481,928	56,694	49,976	35,564	43,920	40,185
1961	2,726	4,510,418	55,700	47,638	36,524	44,595	40,263
1962	2,757	4,602,943	54,836	46,972	36,866	46,175	42,319
1963	2,713	4,610,697	55,496	47,538	36,868	46,904	43,030
1964	2,025	3,730,913	57,175	45,674	37,765	47,545	43,566
1965	1,953	3,644,244	58,793	50,614	36,470	48,320	44,809
1966	1,561	3,357,382	59,394	49,377	34,243	49,116	45,520
1967	1,580	3,396,908	58,872	49,600	33,126	50,358	46,259
1968	1,552	3,292,186	65,263	53,759	32,301	51,129	46,942
1969	1,577	3,281,357	63,261	52,431	33,312	51,675	47,972
1970	1,447	3,089,620	69,381	56,853	33,917	53,437	49,282
1971	2,599	3,422,277	71,011	55,037	36,921	52,504	48,258
1972	2,393	3,191,262	68,175	53,934	33,459	52,714	48,659
1973	2,140	2,910,392	67,448	54,105	32,359	52,928	48,829
1974	2,179	3,031,181	68,171	52,155	30,718	53,864	49,787
1975	2,040	2,825,818	65,862	52,659	31,351	54,185	50,257
1976	2,009	3,017,329	62,741	49,029	31,286	54,770	51,060
1977	2,085	3,062,028	69,692	52,857	31,426	55,238	51,699
1978	2,041	3,092,305	66,815	51,513	32,222	55,956	51,699
1979	2,132	3,175,792	64,679	49,814	32,488	55,333	51,685
1980	2,153	3,153,461	60,650	46,373	34,928	57,028	52,930
1981	2,242	3,328,443	58,088	43,448	35,819	52,548	46,204
1982	2,086	3,225,419	60,189	47,384	34,326	53,202	46,841
1983	2,156	3,381,167	57,644	43,350	35,916	53,542	47,062
1984	2,005	3,212,377	53,435	42,687	35,375	54,586	47,947

Notes: The table presents summary statistics for the samples used to estimate parents' and children's marginal income distributions in our baseline analysis. Columns 1-4 report statistics for children from the CPS, while columns 5-7 report statistics for parents from the Census. Column 1 reports the total number of children observed at age 30 in each birth cohort in the CPS; for example, the 1940 cohort is observed at age 30 in the 1970 CPS. Column 2 reports the sum of the sampling weights for each birth cohort in the CPS, i.e. the weighted cohort size. Columns 3 and 4 report the mean and median incomes of these children at age 30 using our baseline family income measure, which sums income across spouses. Column 5 presents the number of families who have children in each birth cohort, drawing on data from multiple Census years as described in the text. Columns 6 and 7 present the mean and median family incomes of these parents. Incomes are expressed in 2014 dollars, adjusting for inflation using the CPI-U-RS.

Table S2. Absolute Mobility by State and Birth Cohort

State	Absolute Mobility Rate by Birth Cohort (%)					Change from
	1940	1950	1960	1970	1980	1940-80
Alabama	92.0	81.8	64.5	63.9	51.9	40.1
Alaska	87.3		57.2	45.0	37.9	49.4
Arizona	88.5	73.9	57.7	57.5	46.2	42.3
Arkansas	92.1	83.3	70.7	66.0	56.0	36.1
California	89.1	71.2	58.0	57.2	48.8	40.3
Colorado	92.0	77.5	54.9	62.8	49.9	42.1
Connecticut	92.3	79.0	66.8	64.1	51.8	40.5
Delaware	91.6	81.9	70.8		51.4	40.2
District of Columbia	86.3	77.4	71.7	68.9	66.2	20.1
Florida	90.5	77.2	62.3	61.4	45.8	44.7
Georgia	92.1	82.6	63.0	59.5	48.2	43.9
Hawaii	94.4		59.7	54.6	50.0	44.4
Idaho	94.6	81.2	68.4		49.2	45.3
Illinois	92.4	78.2	59.5	58.3	47.0	45.5
Indiana	94.3	79.0	59.7	58.6	48.4	45.9
Iowa	94.8	82.9	65.7	65.7	54.0	40.8
Kansas	93.6	82.1	66.4	63.1	49.7	43.9
Kentucky	91.9	83.3	64.5	70.1	53.4	38.5
Louisiana	88.7	80.1	58.6	59.5	53.2	35.5
Maine	93.2	77.5	74.3	66.8	50.1	43.1
Maryland	90.8	75.3	59.8	59.6	51.2	39.5
Massachusetts	91.4	77.9	67.9	67.5	55.4	36.0
Michigan	93.3	76.8	57.1	58.5	45.7	47.6
Minnesota	94.3	84.1	64.4	63.2	52.9	41.4
Mississippi	90.7	82.8	66.0	66.4	53.1	37.6
Missouri	93.8	80.8	63.0	61.8	52.4	41.4
Montana	91.5	80.1	64.9		58.6	33.0
Nebraska	94.5	83.3	65.4	66.9	54.9	39.6
Nevada	89.1	69.5	51.9	49.2	39.5	49.7
New Hampshire	93.0	78.5	62.8	61.5	51.0	42.1
New Jersey	89.9	77.3	66.7	64.4	52.5	37.4
New Mexico	89.5	80.1	57.3	60.6	50.9	38.7
New York	90.0	77.6	65.8	64.2	54.7	35.3
North Carolina	92.8	83.5	69.0	65.0	49.8	43.0
North Dakota	93.7	84.2	73.6		59.4	34.3
Ohio	93.0	78.0	58.1	58.0	47.9	45.2
Oklahoma	93.8	81.7	64.9	57.1	51.2	42.5
Oregon	92.0	76.5	55.4	60.2	47.7	44.3
Pennsylvania	92.6	81.5	65.9	65.0	53.9	38.7
Rhode Island	90.8	80.1	70.5	66.8	54.4	36.4
South Carolina	91.1	82.8	67.4	63.3	49.4	41.7
South Dakota	92.9	81.3	76.0		62.3	30.6
Tennessee	92.3	81.5	62.2	64.6	49.6	42.7
Texas	91.3	80.5	61.3	58.8	50.5	40.7
Utah	93.7	78.3	64.3	61.1	53.1	40.6
Vermont	91.8	81.5	73.8		47.4	44.4
Virginia	90.6	82.1	65.3	59.9	47.9	42.7
Washington	91.9	76.7	59.4	57.5	45.8	46.1
West Virginia	93.0	82.4	66.2	58.3	49.9	43.1
Wisconsin	94.4	81.0	62.9	63.7	50.6	43.8
Wyoming	91.4	75.1	62.8		49.0	42.4

Notes: This table presents rates of absolute mobility by state for decadal cohorts from 1940-80; the final column shows the magnitude of the change from 1940 to 1980. Since children's state of birth is not observed in the CPS, we use the Census for both parents and children. To increase precision, we include all children aged 25-35 and use the 100% Census in 1940 and 5% IPUMS sample in 1980. Measuring children's incomes from ages 25-35 rather than just at age 30 creates small differences in levels of absolute mobility. To adjust for these differences, we calculate the difference between the baseline national estimates and population-weighted national means of our state-level estimates for each cohort, and add these differences to the state-level estimates. State-cohort cells with insufficient data are blank.

Table S3. Income Variables Used to Measure Parents' Incomes, by Census Year

1940	1950	1960	1970	1980	1990	2000
INCWAGE	FTOTINC	INCWAGE	INCWAGE	INCWAGE	INCWAGE	INCWAGE
INCNONWG		INCBUSFM	INCBUS	INCBUS	INCBUS	INCBUS
		INCOTHER	INCFARM	INCFARM	INCFARM	INCSS
			INCSS	INCSS	INCSS	INCINVST
			INCOTHER	INCINVST	INCINVST	INCRETIR
				INCOTHER	INCRETIR	INCOTHER
					INCOTHER	

Notes: This table lists the income variables in the IPUMS-USA that are used to construct the baseline measures of parental family income by Census year.

Table S4. Income Variables Used to Measure Children's Incomes, by CPS Year

1970-1975	1976-1987	1988-2014
INCWAGE	INCWAGE	INCWAGE
INCBUS	INCBUS	INCBUS
INCFARM	INCFARM	INCFARM
INCSS	INCSS	INCSS
INCGOV	INCGOV	INCRETIR
INCIDR	INCRETIR	INCINT
INCALOTH	INCDRT	INCUNEMP
	INCINT	INCWKCOM
	INCALOTH	INCVET
		INCSURV
		INCDISAB
		INCDIVID
		INCRENT
		INCEDUC
		INCCHILD
		INCALIM
		INCASIST
		INCOTHER

Notes: This table lists the income variables in the IPUMS-CPS that are used to construct the baseline measures of children's family income by CPS year.

References and Notes

1. L. R. Samuel, *The American Dream: A Cultural History* (Syracuse Univ. Press, 2012).

2. J. H. Goldthorpe, *Social Mobility and Class Structure in Modern Britain* (Oxford Univ. Press, 1987).

3. A. Hochschild, *Strangers in Their Own Land: Anger and Mourning on the American Right* (New Press, 2016).

4. In a 2013 speech on economic mobility (www.whitehouse.gov/the-press-office/2013/12/04/remarks-president-economic-mobility), President Obama noted that "people's frustrations" are partly rooted "in the fear that their kids won't be better off than they were."

5. D. Halikias, R. V. Reeves, *How Many People Are Better Off than Their Parents? Depends on How You Cut the Data*. Brookings Institution, 2016; www.brookings.edu/blog/social-mobility-memos/2016/08/10/how-many-people-are-better-off-than-their-parents-depends-on-how-you-cut-the-data/.

6. I. V. Sawhill, J. B. Isaacs, R. Haskins, *Getting Ahead or Losing Ground: Economic Mobility in America*. Brookings Institution, 2008; www.brookings.edu/research/getting-ahead-or-losing-ground-economic-mobility-in-america/.

7. L. Lopoo, T. DeLeire, *Pursuing the American Dream: Economic Mobility Across Generations*. Pew Charitable Trusts, 2012; www.pewtrusts.org/~/media/legacy/uploadedfiles/wwwpewtrustsorg/reports/economic_mobility/pursuingamericandreampdf.pdf.

8. L. Bengali, M. Daly, "U.S. Economic Mobility: The Dream and the Data." *Federal Reserve Bank of San Francisco Economic Letter* 2013:06.

9. G. Acs, D. Elliott, E. Kalish, *What Would Substantially Increased Mobility From Poverty Look Like?* Working paper, Urban Institute, 2016; www.urban.org/research/publication/what-would-substantially-increased-mobility-poverty-look.

10. R. M. Hauser, J. R. Warren, M.-H. Huang, W. Y. Carter, Occupational status, education, and social mobility in the meritocracy. In *Meritocracy and Economic Inequality*, K. J. Arrow, S. Bowles, S. Durlauf, Eds. (Princeton Univ. Press, 2000), pp. 179–229.

11. M. Hout, R. Janus, Educational mobility in the United States since the 1930s. In *Whither Opportunity: Rising Inequality, Schools, and Children's Life Chances*, G. J. Duncan, R. J. Murnane, Eds. (Russell Sage Foundation, 2011), pp. 165–186.

12. R. Chetty, N. Hendren, P. Kline, E. Saez, Where is the land of opportunity? The geography of intergenerational mobility in the United States. *Q. J. Econ.* **129**, 1553–1623 (2014). doi:10.1093/qje/qju022

13. C.-I. Lee, G. Solon, Trends in intergenerational income mobility. *Rev. Econ. Stat.* **91**, 766–772 (2009). doi:10.1162/rest.91.4.766

14. R. M. Hauser, *Intergenerational Economic Mobility in the United States: Measures, Differentials, and Trends*. UW-Madison Center for Demography and Ecology Working Paper 98-12 (2010).

15. R. Chetty, N. Hendren, P. Kline, E. Saez, N. Turner, Is the United States still a land of opportunity? Recent trends in intergenerational mobility. *Am. Econ. Rev.* **104**, 141–147 (2014). doi:10.1257/aer.104.5.141

16. We define the set of "plausible" copulas as copulas under which the distribution of children's incomes is weakly increasing with their parents' incomes (in the sense of first-order stochastic dominance). This restriction rules out perverse copulas that generate negative intergenerational income persistence.

17. C. Goldin, L. F. Katz, *The Race Between Education and Technology* (Belknap/Harvard Univ. Press, 2008).

18. The CPS did not ask for respondents' birthplace prior to 1994; hence, for children born before 1964, we cannot exclude immigrants from the sample. Most of the growth in the foreign-born share of the population occurred in recent decades, limiting the bias created by the inclusion of immigrants in early cohorts (*19*). Moreover, because immigrants' earnings are lower than natives' earnings on average, this bias likely reduces our estimates of absolute mobility in the early cohorts, rendering our estimate of the amount of decline more conservative.

19. National Academies of Sciences, Engineering, and Medicine, *The Integration of Immigrants into American Society* (National Academies Press, 2015).

20. The measures of total pretax income available in the census change over time. From 1970 onward, we use the sum of spouses' personal pretax income minus income from public assistance. In 1960, we use the sum of spouses' personal pretax income. In 1950, we use total family income. In 1940, only income from wages and salaries is available, along with an indicator for nonwage, nonsalary income, which we use to impute nonwage income. See supplementary materials for further details.

21. D. H. Autor, Skills, education, and the rise of earnings inequality among the "other 99 percent". *Science* **344**, 843–851 (2014). doi:10.1126/science.1251868 Medline

22. M. J. Boskin, E. R. Dulberger, R. J. Gordon, Z. Griliches, D. W. Jorgenson, C. Prices, Consumer prices, the Consumer Price Index, and the cost of living. *J. Econ. Perspect.* **12**(1), 3–26 (1998). doi:10.1257/jep.12.1.3

23. C. Broda, E. Leibtag, D. E. Weinstein, The role of prices in measuring the poor's living standards. *J. Econ. Perspect.* **23**(2), 77–97 (2009). doi:10.1257/jep.23.2.77 Medline

24. B. Meyer, J. Sullivan, *Five Decades of Consumption and Income Poverty*, NBER Working Paper 14827 (2009).

25. C. Broda, D. E. Weinstein, Product creation and destruction: Evidence and price implications. *Am. Econ. Rev.* **100**, 691–723 (2010). doi:10.1257/aer.100.3.691

26. The CPI-U-RS (research series) adjusts the CPI-U by correcting for substitution between existing products, following (*22*), and generates inflation rates about 0.5% lower than the CPI-U.

27. R. Wilson, *Personal Exemptions and Individual Income Tax Rates, 1913–2002*. SOI Bulletin Data Release with Historical Data, Internal Revenue Service (2002); www.irs.gov/pub/irs-soi/02inpetr.pdf.

28. K. Parker, *Parenting in America*. Pew Research Center, 2015; www.pewsocialtrends.org/2015/12/17/1-the-american-family-today/.

29. D. S. Johnson, T. M. Smeeding, B. B. Torrey, Economic inequality through the prisms of income and consumption. *Mon. Labor Rev.* **128**, 11–24 (2005).

30. Even the most conservative adjustment of dividing by the total number of people in the family continues to show a 26–percentage point decline in absolute mobility (fig. S2B).

31. C. R. Bollinger, B. T. Hirsch, C. M. Hokayem, J. P. Ziliak, *Trouble in the Tails? Earnings Nonresponse and Response Bias across the Distribution*. Working paper, 2015; www.aeaweb.org/conference/2015/retrieve.php?pdfid=398.

32. T. Piketty, E. Saez, G. Zucman, *Distributional National Accounts: Methods and Estimates for the United States*. NBER Working Paper 22945, 2016.

33. To increase precision, our state-level analysis includes all children aged 25 to 35 and uses the 100% census in 1940 and 5% IPUMS sample in 1980. Measuring children's incomes from ages 25 to 35, rather than just at age 30, creates small differences in levels of absolute mobility. To adjust for these differences, we calculate the difference between the baseline national estimates and population-weighted national means of our state-level estimates for each cohort, and add these differences to the state-level estimates.

34. We cannot examine heterogeneity in absolute mobility by race because race is not observed in the tax data we use to construct the copula.

35. T. Piketty, E. Saez, Income inequality in the United States, 1913–1998. *Q. J. Econ.* **118**, 1–41 (2003). doi:10.1162/00335530360535135

36. The 1.5% growth rate of GDP per working-age family corresponds to total real GDP growth of 2.8% per year, whereas the 2.5% growth rate of GDP per working-age family corresponds to total real GDP growth of 3.8% per year.

37. Plausible changes in relative mobility (the copula) also have modest effects on average rates of absolute mobility. For example, a uniform copula—where children's ranks are

independent of their parents' ranks—would still produce absolute upward mobility for the 1980 cohort of 50%. Greater relative mobility produces higher rates of absolute mobility for children with low-income parents while reducing rates of absolute mobility for children with high-income parents, leaving average absolute mobility essentially unchanged.

38. M. Corak, 'Inequality is the root of social evil,' or maybe not? Two stories about inequality and public policy. *Can. Publ. Policy* **42**, 367–414 (2016). doi:10.3138/cpp.2016-056

39. D. Feenberg, E. Coutts, An introduction to the TAXSIM model. *J. Policy Anal. Manage.* **12**, 189–194 (1993). doi:10.2307/3325474

40. L. E. Fox, C. Wimer, I. Garfinkel, N. Kaushal, J. Waldfogel, Waging war on poverty: Poverty trends using a historical supplemental poverty measure. *J. Policy Anal. Manage.* **34**, 567–592 (2015). doi:10.1002/pam.21833 Medline

41. B. Meyer, W. Mok, J. Sullivan, *The Under-Reporting of Transfers in Household Surveys: Its Nature and Consequences*. Working paper, 2015, previously circulated as NBER Working Paper 15181.

42. S. Ruggles, K. Genadek, R. Goeken, J. Grover, M. Sobek, *Integrated Public Use Microdata Series: Version 6.0*. University of Minnesota (2015).

43. We determine marital status and partner using both the SPLOC and MARST variables. For more detail, see https://usa.ipums.org/usa/chapter5/chapter5.shtml.

44. Our approach double-counts the incomes of individuals who have children at exactly age 25 or 35. We adopt this approach to obtain a symmetric window around age 30. Measuring incomes when parents are between ages 25 and 34, or 26 and 35, to avoid double-counting yields estimates of absolute mobility that bracket the estimates we report.

45. Because we do not use data on parents' incomes from earlier censuses, the number of observations used to construct parents' income distributions for the 1940 birth cohort is lower than for subsequent cohorts (table S1).

46. For further detail on this procedure, see https://cps.ipums.org/cps/income_cell_means.shtml.

47. J. Cilke, *A Profile of Non-Filers*. U.S. Department of the Treasury, Office of Tax Analysis Working Paper 78, 1998.

48. The estimates of tax credits from TAXSIM are frequently higher than those estimated in (*40*), consistent with underreporting of credits and transfers in survey data (*41*). To check whether such underreporting affects our results, we implement specifications doubling the transfers reported by (*40*). The estimates of absolute mobility are not affected appreciably by such a correction.

49. For simplicity, when we measure parents' incomes in the CPS, we only include parents between the ages of 25 and 35 who have a child less than 1 year old at the time of the

survey. Unlike in our baseline analysis, we do not pool earlier or later surveys to include parents who have children before age 25 or after age 35 when estimating parents' incomes using the CPS. This is why the levels of absolute mobility in this series are closer to those in fig. S8, which shows comparable estimates from our baseline census-CPS specification. When we estimate children's incomes using the census, we include individuals born in the United States who are 30 years old.

50. We use the same counterfactual GDP—applying 30 years of a 2.5% annual growth rate to GDP in 1980—even though children are 40 years old when we measure their incomes because children's incomes are still measured approximately 30 years after their parents' incomes.