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RACE MATTERS: INCOME SHARES, INCOME INEQUALITY, AND INCOME MOBILITY
FOR ALL U.S. RACES

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Race Matters: Income Shares, Income Inequality, and Income Mobility for All U.S. Races
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ABSTRACT

This paper presents income shares, income inequality, and income immobility measures for all race and ethnic groups in the United States using the universe of U.S. tax returns matched at the individual level to U.S. Census race data for 2000–2014. Whites and Asians have a disproportionately large share of income in top quantiles. Income for most race groups ranges between 50–80 percent of the corresponding White income level consistently across various percentiles in the overall income distribution—suggesting that class alone cannot explain away overall income differences. The rate of income growth at the 90th percentile exceeds that of the 50th and 10th percentiles for all race and ethnic groups; divergence is largest for Whites, however, in the post-Great Recession era. Income immobility is largest for the highest-income races. Overall, these results paint a picture of a rigid income structure by race and ethnicity over time.

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1   Introduction

Race matters for economic and social outcomes. In the U.S., persistent differences exist across racial and ethnic groups in wages, employment, home ownership, arrests, and health outcomes. For example, the Black-White male earnings ratio has stagnated at 0.8 after decades of convergence (Lang, Kevin and Lehmann, Jee and Yeon, K, 2012); Black life expectancy is approximately four years shorter than for Whites; and Black infant mortality rates are higher relative to Whites by 140 percent (Boustan and Margo, 2012). Homicide arrests have not dropped below a Black-White ratio of seven (LaFree et al., 2010), and Black-White home ownership differed by about 23 percentage points as recently as 2007 (Collins and Margo, 2011). Even after controlling for compositional differences such as ability, experience, or educational attainment and quality, disparities do not completely disappear across race and ethnic groups (Altonji and Blank, 1999; Carruthers and Wanamaker, 2017; Darity and Mason, 1998; Ritter and Taylor, 2011; Black et al., 2006; Ramraj et al., 2016; Fryer Jr, 2011; Bayer and Charles, 2016; Juhn et al., 1991, 1993; Neal and Johnson, 1996; Bound and Freeman, 1992).[1]

While there is mounting evidence that race matters in a series of important economic contexts, one area that has received relatively little attention along race and ethnic lines is the recent rise in income inequality in the U.S. There have been significant efforts in recent years to identify and explain increased income inequality and reduction in income mobility for the general population. However, none of that work has focused on differences by individual race or ethnicity (Piketty and Saez, 2003; Chetty et al., 2014; Kopczuk et al., 2010). When a researcher uses administrative records from the Social Security Administration or from tax filings in isolation, he or she cannot evaluate on how inequality varies between or within race and ethnic groups. As a result, understanding racial and ethnic income inequality and mobility continues to be one of the more important unaddressed questions in economics.[2]

Correctly identifying changes in income inequality and income mobility by race matter for economic policy and analysis. Anti-poverty policies hinge on concerns regarding the differential resources of race and

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[1]In the relatively few cases when differences are explained, the explanatory variables—such as employment opportunities, educational opportunities, or household characteristics—are often highly correlated with race and ethnicity. In these cases, pre-market conditions suggest disparities in access to or quality of educational institutions; these disparities are highly correlated with race and ethnicity and may simply imply an explanation for disparities, predating entry into the labor market, that are still race- or ethnicity-based.

[2]Measures of income inequality are meaningful on their own and may determine other economic outcomes. For example, inequality may drive racial residential segregation (Reardon and Bischoff, 2011) and may reduce the incentive to invest in higher education (Kearney and Levine, 2016). There is also some evidence that inequality may reduce the societal support for public assistance programs (Ashok et al., 2015). Violent crimes may also be causally related to high levels of income inequality (Kennedy et al., 1998; Fajnzylber et al., 2002). Income inequality may also affect adult health outcomes with a lag (Subramanian and Kawachi, 2004). In tight housing markets, increased income inequality may more than proportionately affect the poor, who have to pay more for housing (Matlack and Vigdor, 2008). Kawachi et al. (1997) finds that increasing income inequality reduces investment in social capital, which then increases adult mortality. Related to this, Hout (2016) finds that higher levels of inequality reduce happiness.

ethnic groups, yet we do not have a solid picture of these groups' resources relative to majority Whites across time. Data limitations mask the experiences of some of the most economically marginalized populations in the U.S., such as American Indians and Pacific Islanders. Additionally, treating the large race and ethnic groups as homogeneous may ignore important changes at the extreme ends of these populations and hide emerging concerns (or successes). These have important policy consideration in terms of migration, social welfare programs, housing, health, and education.

We are the first to conduct an analysis of income inequality and mobility by race and ethnic origin using data that include, first, an administrative source of income for the population of U.S. tax filers (amounting to more than 100 million observations each year); second, the race and ethnic origin of each observation; third, a long continuous time frame (15 years) over which we can track individual income trajectories; and fourth, income data that is not top-coded or otherwise censored. While some economists have used survey data, such as the Survey of Consumer Finance, to examine the long-run trends in income and asset inequality for the U.S. (Keister, 2000; Kochhar and Fry, 2014), because of small sample sizes for certain race and ethnic groups, researchers often only focus on inequality measures for Whites, Blacks, and Hispanics (Bloome and Western, 2011; McKernan et al., 2015; DeBacker et al., 2013). Such research is limited in that it potentially obscures different patterns of inequality for smaller racial and ethnic groups. Sociologists, to some extent, have examined income inequality by race, but such work has been limited to only two or three large groups due to sample size constraints or to cross-sectional analyses using U.S. Census decennial data (Bloome, 2014; Bloome and Western, 2011; Reardon and Bischoff, 2011; Snipp and Cheung, 2016). Additional problems exist with survey data beyond the relatively small sample sizes for ethnic and racial minorities. There are well-known measurement issues with income reported in survey data that can distort measures of inequality.[3] Moreover, since panel data is necessary to study income mobility, few studies exist that examine difference by race beyond comparisons of White and Black differences in mobility patterns (Bloome, 2014).

We overcome the usual data limitations by using Internal Revenue Service (IRS) tax data linked at the person level to U.S. Census Bureau race and Hispanic origin data. Because these data cover more than 90 percent of the universe of working-age tax filers in the U.S. in each year of our study, we are able to report on income inequality and mobility across previously unreported groups and to measure the differential experience between and within all race and ethnic groups. We also create a panel data set at the individual level for all tax filers over our 15-year period. In looking at our defined race and ethnic groups (White, Black,

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[3]First, survey respondents at the lower end of the income distribution tend to over-report their earnings while those at the higher end tend to under-report (Pedace and Bates, 2000; Meyer and Mittag, 2015). Second, income non-response rates in surveys are both high and not randomly distributed across respondents.

American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, Other, and Hispanic[4]), we document significant racial and ethnic income inequality in the midst of overall increasing income inequality in the U.S.

We have three main findings. Whites tend to have a disproportionately large share of income in top quantiles, while all other races accrue a disproportionately large share of income at the bottom 10 percent and 1 percent of the overall income distribution. Blacks, American Indians, and Hispanics are consistently at the low end of the total income distribution compared to Whites, Asians, and those in the Other group. Pacific Islanders tend to fall in between the two extremes. Most race groups (with the exception of Asians) range between 50 percent and 80 percent of the corresponding White income level consistently across various percentiles in the income distribution. This suggests that race differences persist regardless of skill attainment and within-group income distributions, indicating that race and ethnicity "matter" beyond class distinctions.

Our second novel finding is that the rate of income growth at the 90th percentile exceeds the rate of growth at the 50th percentile for all race and ethnic groups suggesting a divergence in income inequality in the top half of the income distribution. At the bottom of the income distribution we find that the growth of income at the 50th percentile matched the rate of growth at 10th percentile and there is little increase in income inequality there over time. One exception is for Whites—we find that there is an increase in income inequality due to a steady decrease in the level of income at the 10th percentile. These results indicate that the top part of the income distribution is diverging away from the rest of the income quantiles and—to a lesser extent—for many groups the middle part of the income distribution is diverging away from the bottom. This is a general result that persists across most race and ethnic groups; however, it is the most pronounced for Whites.We find for Blacks that there is a slight reduction in income inequality at the bottom half of the income distribution driven primarily by an increase in income thresholds for the 10th percentile over time. One should not take this, necessarily, as a good sign since there are still large absolute differences in the income at the 10th percentile for Blacks as compared to the 10th percentile for Whites it is only $9,061 for Blacks but it is $13,914 for Whites.

The third finding is that income mobility decreased for all race and ethnic groups between 2000 and 2014. We observe a decrease in income mobility after the Great Recession and find that there is a convergence in overall immobility for all race and ethnic groups. Levels of income mobility are low and of a

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[4]The U.S. Census Bureau adheres to the Office of Management and Budget's 1997 race and ethnicity standards, which specify five major race groups: White, Black or African American ("Black" here), American Indian or Alaska Native ("American Indian" or "AIAN" here), Asian, and Native Hawaiian or Other Pacific Islander ("Pacific Islander" or "NHPI" here), and define two ethnic groups (Hispanic and non-Hispanic). For our study, we define each race group as that race alone and non-Hispanic, except for Other, which includes non-Hispanic multiple race respondents as well as people who reported Some Other Race. Hispanic is defined as Hispanic of any race.

similar magnitude to those found by other researchers using historical data (Kopczuk et al., 2010). Whites and Asians experienced less within-group mobility relative to other groups. On the other hand, an analysis using rank correlation indicates that Blacks, Hispanics, and American Indians are more immobile than other groups when rank is calculated from the overall distribution. There are noticeable differences across groups in mobility over time. Asians and Whites exhibit higher mobility in a transition matrix analysis compared with Blacks, Hispanics, and American Indians. Blacks, Hispanics, and American Indians have a higher probability of experiencing downward mobility compared to Whites and Asians. Together, these results paint a picture of a rigid income structure, where Blacks, Hispanics, and American Indians may move within their own income distributions but still are stuck at the bottom overall.

Overall this paper provides detailed evidence for an entrenchment in income across races and ethnicities in the US for the past two decades. Not only are disproportionately large amounts of income accruing to the top end of the income distribution, it is also accruing disproportionately to a few race groups. Within race groups, the difference between the top and bottom incomes has been widening with a significant divergence for Whites especially in the past few years. Finally, we document that income immobility is high and fairly consistent for all race and ethnic groups in the US. These details belie key beliefs within the U.S. that a person can "get ahead" regardless of race and ethnic origin, and that race doesn't matter independently from class.

The paper proceeds as follows: The next section provides information on the data sets used in our analysis and the process of linking these data. In section 3, we provide descriptive evidence documenting the patterns of income inequality and income shares across racial and ethnic groups. Section 4 reports estimates of both within-group income mobility and group-specific income mobility for the entire income distribution. Section 5 concludes. We also provide a data appendix that includes further analysis and robustness checks on the main data selection choices. These checks include analyses that use linked W-2 data and the population of working-age men in the 2000 and 2010 censuses.

2   Data Set Description and Data Linkage

We use restricted-use data in our study. The data come from two separate sources: the U.S. Census Bureau and the IRS. Records are linked at the U.S. Census Bureau using a process whereby individuals in each data set were given a unique, protected identification key, called a PIK. When a Social Security Number (SSN) is available in a data set, the identifier is assigned based on SSN. For records without an SSN, personally

identifiable information such as name, address, and date of birth is used in probabilistic matching to assign PIKs.[5] Personal information is then removed from each data set before they may be used for research purposes. Only those observations that received the unique person identifier are used in the analysis.

It is important to note that the record-linkage approach we use to link the data introduces some bias. Minorities and people with lower socioeconomic status are less likely to receive a record-linkage key compared to Whites and people who have higher levels of socioeconomic status (Bond et al., 2014). Given that our analysis focuses on income inequality and immobility, this difference in likelihood would result in downward bias of any estimates of inequality and immobility between race and ethnic groups. While we demonstrate that we cover the vast majority of working-age tax filers in our study in tables that follow, we do caution that our results may underestimate this population's inequality and immobility by race and ethnicity for the study period. It is likely that the non-matches between the IRS and the Census race and ethnicity data are among low-income individuals and minorities.[6]

The Census data, referred to here as "race and ethnicity" data or information, is a multi-year data set that combines the 2000 and 2010 decennial censuses with ACS data from 2001 to 2014. These data were combined specifically to capture race and Hispanic origin reported by U.S. households. We selected the reported race and Hispanic origin from the most-recent decennial census file when available for each individual. We then selected the most recent ACS race and Hispanic origin response for individuals who did not have a race or ethnicity response in one of the decennial censuses.

We link the race and ethnicity file to 2000 to 2014 Form 1040 data. We use Adjusted Gross Income (AGI) for our analyses, which includes all sources of income for a tax unit and all adjustments to income. Unlike previous inequality research that uses tax data and examines the top end of the income distribution, we do not have separate fields for different income sources, and thus lack the ability to partition out market income. This should matter less for looking at the entire distribution of tax filers, however, since for most tax filers, the main source of income is wage earnings. Another way in which we differ from previous research is in our unit of analysis, which is the individual rather than the tax unit. We chose to examine primary and secondary filers separately for several reasons. First, because we wish to examine individual income trajectories over time, we want to capture filers who may file as married in some years and unmarried in others. Second, married filers may be of different races or ethnicities, and removing spouses from the sample of filers may bias our estimates. This is especially true if married filers of a given race or ethnicity are more

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[5]For more information on the linking process, see Wagner and Layne (2014).

[6]We examine those with W-2 data and all men of working age from the decennial censuses in the appendix to assess how much bias may be induced by examining only tax filers.

likely to be the primary filer. Last, in using every primary and secondary filer, we can examine a weighted measure of AGI that reflects the true resources accruing to each filer.

Specifically, we create a file that lists each primary and secondary Form 1040 filer separately, and then remove any filers who are claimed as dependents on another filer's Form 1040. Using the number of dependents reported on the form and the number of adults reflected in the filing status, we calculate the number of persons in the tax unit for each primary and secondary filer. Then we multiply each filer's AGI by an equivalency scale suggested by Citro et al. (1995), which weights income using the adults and children in a household.[7] Additionally, in line with previous research, we have restricted our universe to the working-age population—those aged 25 to 65 in a tax year—and those with AGI greater than or equal to zero.

To assess the representativeness of our data, we separately matched the 2010 Census data for people ages 25 to 65 to the 2010 Form 1040s. This matched data set can be considered a point-in-time assessment of the quality of the match. It should be emphasized that PIK assignment on the Form 1040 data is based on SSN, and thus the rate of PIK assignment is close to 100 percent. As shown in Table 1, the matched data contain higher proportions of Whites and Asians and lower proportions of the other race and ethnic groups in our study compared with 2010 Census (Column f). Lower match rates for certain groups in our data are due not only to the slightly lower likelihood of receiving a PIK compared with Whites and Asians, but also due to lower participation in the labor force and in income tax filing for these groups.[8] Blacks and American Indians, as well as Hispanics and Pacific Islanders, have lower incomes compared to Whites and Asians (Ramakrishnan and Ahmad, 2014) and thus may be less likely to file taxes compared to these groups. Our universe has similar proportions of people ages 25 to 44 and 45 to 65, and we match more women than we do men (indicating both that women are more likely than men to be either a primary or secondary filer and that women are more likely to receive a PIK).

Because race and ethnicity information is not available on the 1040s, it is impossible to know how well we match certain lower-income groups *contingent on filing a 1040*. However, we are able to compare our final number of matched tax filers to publicly available data to assess how much of the tax-filing population we capture. These data were available from 2010 forward from the Statistics of Income (SOI) division of the IRS. Table 2 indicates that we cover about 94 to 96 percent of the tax-filing population (Column c). One explanation for why the numbers of observations in our linked data are lower each year than the SOI estimates is that the SOI estimates include U.S. citizens working abroad, while our linked data represent

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[7]The number of household members are equal to the following: $(A + 0.7K)^{0.7}$ where A = number of adults in the household and K = the number of children (Citro et al., 1995).

[8]See National Center for Education Statistics Table 427, http://nces.ed.gov/programs/digest/d12/tables/dt12_427.asp.

Table 1: 2010 Census Race and Ethnicity Data Matched to 1040s, Ages 25–65

	2010 Census Number (a)	Percent (b)	2010 Census PIKs Number (c)	Percent (d)	2010 Census– IRS Match Number (e)	IRS Match out of total 2010 Census Percent (f)
Total	166,305,994	100.0	151,565,180	91.1	123,783,849	74.4
Sex						
Male	82,083,737	49.4	74,069,567	90.2	58,876,049	71.7
Female	84,222,257	50.6	77,495,613	92.0	64,907,800	77.1
Age group						
25-44	82,123,330	49.4	73,362,250	89.3	60,402,428	73.5
45-65	84,182,664	50.6	78,202,930	92.9	63,381,421	75.2
Race						
White	109,396,016	65.8	102,361,646	93.6	86,622,296	79.2
Hispanic	24,631,312	14.8	20,572,899	83.5	15,852,995	64.4
Black	19,832,168	11.9	17,468,337	88.1	12,080,486	61.0
AIAN	1,174,014	0.7	1,024,411	87.3	698,199	59.5
Asian	8,530,347	5.1	7,686,570	90.1	6,667,599	78.1
NHPI	255,324	0.2	216,815	84.9	165,558	64.9
Other	2,486,813	1.5	2,234,502	89.9	1,696,716	68.2

The table shows a single year of demographic data, including race and ethnic origin, derived from Census 2010 and matched to Form 1040 data from the same year. This allows for a point-in-time estimate of filing rates and match quality.
Source: Census 2010 data linked to 2010 Form 1040 data.

the U.S. resident population.[9] When we further restrict the data to filers with AGI greater than or equal to zero, our capture rates decrease to between 91 and 93 percent (Column f).[10]

Overall, our data provide several improvements and advantages to existing data used to estimate income inequality and immobility by race and ethnicity. Our data are large enough that we are able to identify all of the major race and ethnic categories in the U.S. Additional problems exist with survey data beyond the relatively small sample sizes for ethnic and racial minorities. There are well-known measurement issues with income reported in survey data that can distort measures of inequality. First, survey respondents at the lower end of the income distribution tend to over-report their earnings while those at the higher end

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[9]Estimates of Americans living and working abroad range from 2.2 to 6.8 million people (Costanzo and von Koppenfels, 2013). When we subtract 2.2 and 6.8 million people from the SOI estimates, our universe coverage rates of the SOI estimates increase to between 95 and 100 percent compared to 94 and 96 percent.

[10]Comparing 2010 1040s and W-2s matched to the 2010 Census also helps us assess the representativeness of our universe. W-2s cover the distribution of wage earners with the exception of the self-employed. We find that 1040s cover more people ages 25 to 65 in the 2010 Census compared with W-2s. Each race group has a higher number of people in the 2010 Census-1040 matched universe relative to the 2010 Census-W-2 matched universe. While the race distributions are generally similar between both universes, the proportion of Blacks in the matched 2010 Census-1040 universe is lower relative to W-2s, and the proportion of Asians and Hispanics is slightly higher in the 2010 Census–1040 universe. This further supports the suitability of our data for this analysis. Our universe contains a higher proportion of women relative to men, while the W-2 universe covers slightly more men. This higher coverage of females in our universe is likely in part because we are capturing women who are out of the labor force, but married to a spouse who is earning income and filing income tax. Our W-2 analysis is available upon request. In the Appendix to this paper, we perform an analysis in which we add W-2 nonfilers to our analytic data from 2005 to 2014.

Table 2: Number and Percent of Tax Filers in Matched 1040 and Census Data, Ages 25 to 65

Year	Total Individuals from SOI (a)	Tax Filers in RE–Form 1040 file (b)	Percent (c)	SOI Tax Filers with AGI>=0 (d)	RE–1040 Filers with AGI>=0 (e)	Percent (f)
2000	-	128,921,786	-	-	123,578,069	-
2001	-	129,793,940	-	-	125,279,453	-
2002	-	130,569,116	-	-	125,814,539	-
2003	-	131,177,615	-	-	126,299,847	-
2004	-	132,172,267	-	-	127,191,375	-
2005	-	133,293,435	-	-	128,207,203	-
2006	-	135,162,521	-	-	129,831,114	-
2007	-	143,344,007	-	-	133,852,450	-
2008	-	138,719,168	-	-	132,885,452	-
2009	-	138,215,191	-	-	132,408,142	-
2010	145,626,457	139,360,334	96	143,699,907	133,329,141	93
2011	146,153,957	139,869,823	96	144,166,079	133,569,107	93
2012	145,264,554	138,526,757	95	143,537,485	132,390,872	92
2013	146,085,542	137,918,301	94	144,433,822	131,764,470	91
2014	146,599,415	137,532,145	94	144,969,444	131,384,380	91

Sources: Columns (a) and (d) are authors' calculations based on publicly available aggregate data from the IRS (see https://www.irs.gov/uac/soi-tax-stats-individual-income-tax-returns-publication-1304-complete-report). Columns (b) and (c) report matches between the race and ethnicity (RE) file–Form 1040 data, 2000 to 2014. A "-" indicates that IRS aggregate data were not publicly available for the year in question.

tend to under-report (Pedace and Bates, 2000; Meyer and Mittag, 2015). Second, income non-response rates in surveys are both high and not randomly distributed across respondents. For example, annual earnings non-response rates in the Current Population Survey (CPS) and American Community Survey (ACS) are close to 20 percent, and non-response rates are highest for extreme high- and low-earner households (Bollinger et al., 2014). The resulting bias understates earnings inequality (Bollinger et al., 2014, 2015).

We also have a distinct advantage with our data that we are able to create a panel data set at the individual level to evaluate income mobility by race and ethnicity. Assessing income mobility requires having measures of income for the same individual at multiple points in time, making it even more difficult to study income mobility for all race and ethnic groups using survey or unlinked administrative records. To our knowledge, no studies to date evaluate income mobility using data linked at the individual level for all race and ethnic groups in the U.S. for the current time period.

3 Income Shares and Inequality Measures by Race and Ethnicity

In this section, we describe the distribution of income data by race and ethnic groups for two periods in our time frame: for 2000 and for 2014 (in 2014 dollars). Previous research has shown that incomes are

increasingly concentrated in the top decile of earners, with the highest concentration occurring in the top tenth of one percent (Piketty and Saez, 2003).[11] These results mark a shift from the compression of wages in the middle of the 20th century, which brought inequality to its lowest levels in U.S. history (Goldin and Margo, 1992). Given the detailed nature of our data, we can provide several measures that outline the evolution of income inequality and the concentration of income to different parts of the distribution. We measure income at the individual level as discussed previously, using income equivalency weights to account for household composition.

3.1 Income Distribution and Income Shares

In Figures 1 and 2, we provide the kernel density estimate of income for our seven race and ethnic groups for 2000 and 2014 (in 2014 dollars). In order to show the main part of the distribution on a single graph, we present income by group for those reporting between $0 and $200,000 in AGI. The White group is the most right skewed of the densities in the figures, and the mass for this distribution is significantly to the right of all of the other race and ethnic groups, which indicates that they had the highest average (and median and mode) incomes. The Asian category also has a rightward skew, but not to as large a degree as do Whites. The Asian category also has clustering at the far left of the distribution, suggesting greater inequality within the Asian category relative to Whites.

The remaining five groups (Hispanic, Black, American Indian, Pacific Islander, and Other) all tend to be clustered at the far left of the income distribution. The masses of those distributions are centered below approximately $25,000. Generally, for most groups the income distribution patterns are similar in 2000 and 2014. Notably, however, we find an increase in the number of Asians in the upper end of the income distribution between 2000 and 2014. There is also a moderate increase of the number of Hispanics in the middle income range between 2000 to 2014.

The mean AGI for our entire universe shows similar patterns. Whites had the highest mean AGI at $61,565 in 2000, followed by Asians at $58,444. In contrast, the mean AGI for Hispanics, Blacks, and American Indians was in the low $30,000s. The Other group and Pacific Islanders fall in between these high-income and low-income groups. Generally, the mean AGI across groups remained stable from 2000 to 2014, with the exception of the mean AGI for Asians, which increased to $64,369 in 2014, surpassing the

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[11]There are a number of studies in the literature that use administrative data to measure income inequality in the U.S., especially the growth of the top percentiles. Recent work by Piketty and Saez (2003) identifies the increasing share of total income that has gone to the top income deciles in the last few decades. Feenberg and Poterba (2000) find an increase in the fraction of income accruing to the top 0.5 percent using U.S. IRS tax data over the period 1960–1995. In the latter analysis, the authors examine Adjusted Gross Income (AGI) measured in three different ways (including and excluding capital gains and statutory gains). All of the recent research confirms an increase in income inequality since the 1970s.

Figure 1: Kernel Density in 2000 by Group

	White	Hispanic	Black	AIAN	Asian	NHPI	Other
Full sample mean	61,564	31,255	32,929	34,273	58,444	38,967	45,593
AGI<=200,000 mean	46,878	28,663	31,547	31,348	45,029	34,822	36,853
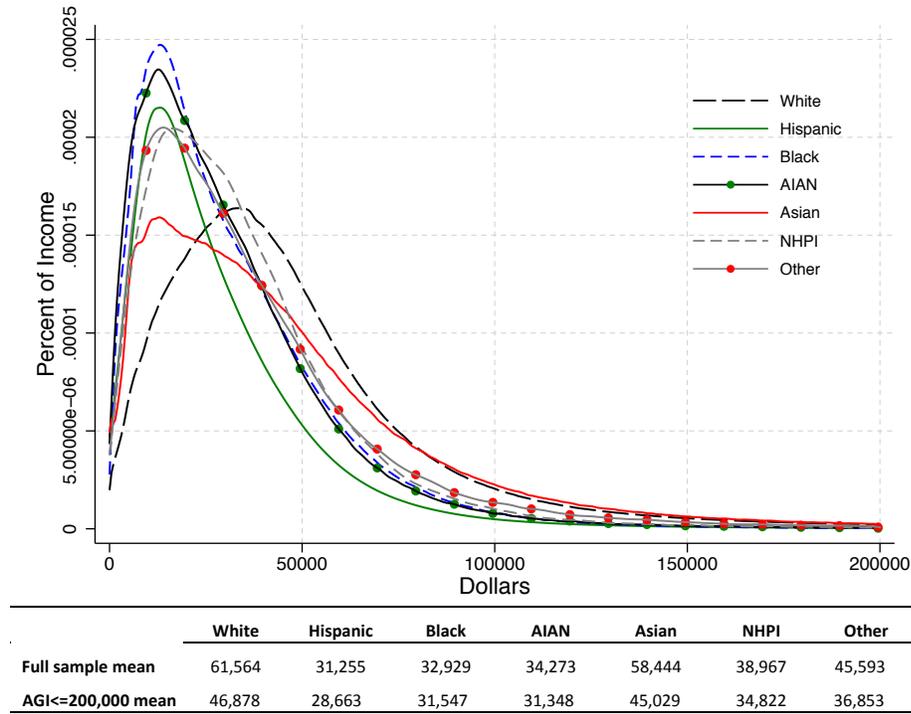
Figure 2: Kernel Density in 2014 by Group

	White	Hispanic	Black	AIAN	Asian	NHPI	Other
Full sample mean	61,445	34,164	32,578	36,369	64,368	37,719	48,025
AGI<=200,000 mean	47,430	31,134	30,859	32,847	49,360	34,707	38,602
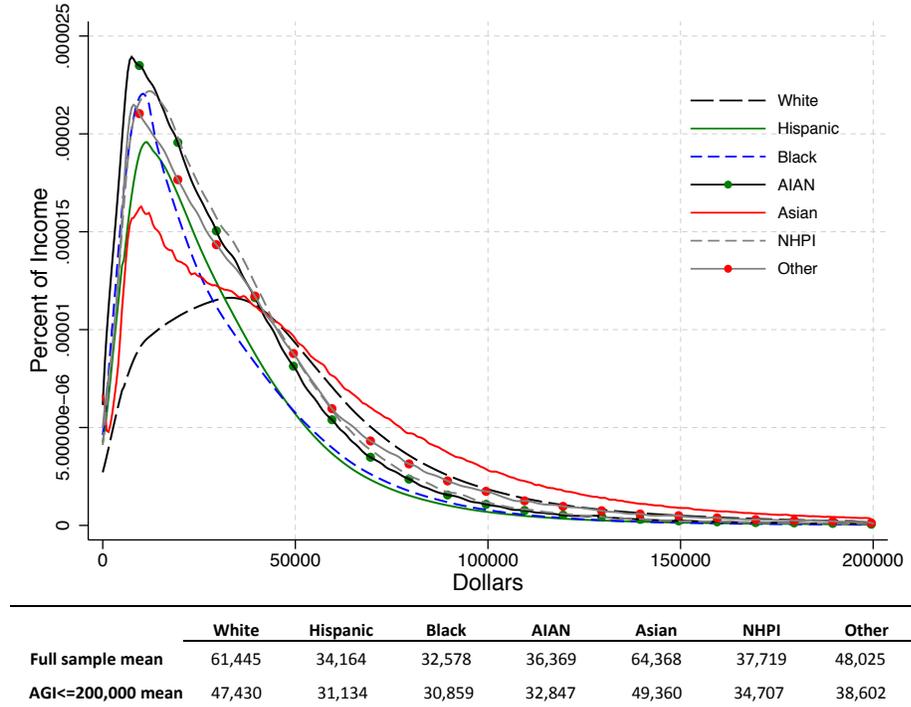
Source: Race and ethnicity file–Form 1040 data, 2000 and 2014.

mean AGI for Whites.

We next decompose the total share of income accruing to the top 10 percent, 1 percent, and 0.1 percent of the income distribution, as well as the income shares going to the bottom 10 percent and 1 percent. Piketty and Saez (2003) show that the proportion of income accruing to the top percentiles of the income distribution has been steadily increasing over the past few decades. Our analysis in this section identifies whether those at the top and bottom segments of the income distribution were proportionate to their group's share in the total population.

In Table 3, we show the share of income for the different income percentiles for 2000 and 2014.[12] The share of income accruing to the top 10 percent of the population of all tax filers was about 41 percent in 2000 and 40 percent in 2014. Looking across the columns for 2000, about 90 percent of the income that accrued to the top 10 percent of the income distribution of tax filers went to Whites, while about 2.5 percent went to Hispanics, 2.1 percent to Blacks, 0.25 percent to American Indians, and 5.3 percent to Asians. At the bottom of the panel, we report the proportion of the population of each of these groups for our restricted sample of tax filers ages 25 to 65. Comparing the share of the population to the share of income accruing to each group provides an additional measure of inequality. Whites received a strongly disproportionate share of top income, while Asians received slightly more than their proportionate share. Meanwhile Hispanics, Blacks, American Indians, Pacific Islanders, and Others accrued less than their proportionate share of total income in the top 10 percent. Looking at Panel B, there are noticeable changes over time: The share accruing to Whites decreased to about 84 percent and the share for Hispanics increased to 4 percent. However, the proportion of Whites in the population decreased to about 70 percent, while Hispanics increased to about 13 percent. Asians realized an increase to an 8 percent share while Blacks, American Indians, and Pacific Islanders did not realize any noticeable changes at the top 10 percent over this time period.

The next row provides a similar analysis for the top 1 percent of the income distribution of tax filers. Compared to the preceding row, inequality is even more pronounced at this percentile of the distribution. Examining the portion accruing to the various race and ethnic groups indicates that the share that went to Hispanics, Blacks, American Indians, and Pacific Islanders is smaller in percent terms than for the top 10 percent. In other words, there is even more inequality across race and ethnic groups at the uppermost ends of the income distribution. Changes over time indicate a similar pattern to the top 10 percent: Groups besides White and Pacific Islander improved their share while also increasing their representation in the

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[12]Appendix Table 1 shows the population distribution and top and bottom shares for every year of our data. Patterns of change roughly hold true when looking at every year rather than the first and last year, but interesting patterns can be observed for before, during, and after the Great Recession; future research intends to follow up on these differences.

Table 3: Shares of Income by Race, 2000 and 2014

			As a Percent of Row Total						
Panel A: 2000		Overall Total	White	Hispanic	Black	AIAN	Asian	NHPI	Other
Top	10	40.79%	89.73%	2.46%	2.11%	0.25%	5.26%	0.07%	0.13%
	1	17.87%	92.10%	1.88%	0.97%	0.19%	4.67%	0.06%	0.13%
	0.1	8.85%	92.53%	1.65%	0.95%	0.16%	4.54%	0.06%	0.12%
Bottom	10	1.20%	54.88%	19.57%	18.18%	1.56%	5.32%	0.23%	0.27%
	1	0.02%	59.51%	13.13%	19.66%	2.00%	5.18%	0.25%	0.26%
Population proportion			75.13%	9.61%	9.72%	0.84%	4.37%	0.17%	0.18%
			As a Percent of Row Total						
Panel B: 2014		Overall Total	White	Hispanic	Black	AIAN	Asian	NHPI	Other
Top	10	40.31%	84.13%	4.10%	2.76%	0.33%	8.40%	0.08%	0.20%
	1	16.01%	87.83%	3.13%	1.39%	0.25%	7.16%	0.05%	0.19%
	0.1	7.35%	89.10%	2.75%	1.37%	0.21%	6.35%	0.04%	0.18%
Bottom	10	1.00%	50.68%	20.35%	21.42%	1.39%	5.53%	0.30%	0.32%
	1	0.01%	66.18%	12.03%	14.34%	1.57%	5.32%	0.25%	0.30%
Population proportion			69.48%	12.79%	10.67%	0.85%	5.74%	0.22%	0.23%

The table reports the total income share accruing to persons within the portion of the income distribution reported in the row, broken out by race and ethnic group. Population proportions are reported for comparison.
Source: Race and ethnicity file–Form 1040 data, 2000 and 2014.

population.

The results for the top 0.1 percent of the income distribution indicate an even larger proportion accruing to a much smaller share of the population. Once again, Whites have the largest portion of the income share at this income percentile compared with their share of the population. Patterns are similar to the previous row, and changes over time exhibit the same trade-off in income and population shares.

For the bottom 10 percent and bottom 1 percent of the income distribution, only about 1 percent of the total income in the U.S. is accrued in each year. Whereas the top 10 percent received about four times their proportionate share of total income, the bottom 10 percent received about one-tenth of their proportionate share. The proportions of income accruing to the various race and ethnic groups indicates that Whites received less than their proportionate share while Hispanics, Blacks, American Indians, Pacific Islanders, and Others received more than their proportionate shares. Asians also received more than their proportionate share of income at the bottom of the overall distribution than their share of population would suggest. This group received more than its proportionate share at both the top and bottom income percentiles, suggesting strong heterogeneity within this group. The next rows provide the income share accruing to the bottom 1 percent. The share accruing to Hispanic and Black was lower than in the previous

panel and the share going to Whites was somewhat larger but still less than proportionate to their population share.

In terms of overall inequality, comparing 2000 to 2014 indicates a slight decrease in income shares at the very top (the top 1 and 0.1 percent). However, this is offset by a decrease in income shares at the bottom of the distribution. For example, for the bottom 10 percent, the income share decreased from 1.20 percent to 1.00 percent; the bottom 1 percent's share decreased from 0.02 to 0.01. This loss of resources at the lowest end of the distribution is consistent with analyses presented in Section 3.4, which indicate a rise in inequality over the time period.

In Figures 3 and 4 we present the same information in a slightly different manner, showing the relative size of the shares of top and bottom income percentiles. In Figure 3 we plot the share of income that accrued to the top 10 percent of the income distribution in 2000 (the open marker) and again in 2014 (the closed marker) for each race and ethnic group. The red vertical line at 1 indicates parity—this would indicate that a race or ethnic group received exactly the share of the top 10 percent that is proportionate to their share of the overall population. For Whites, for example, the two markers are to the right of the red vertical line, indicating that Whites receive more than their proportional share of income in the top 10 percent of the distribution. The other race and ethnic groups tend to be below parity and, in particular, below the 0.5 ratio. One exception is the Other race group, which went from below parity in 2000 to slightly above parity in 2014. The most striking result, however, is for Asians; this group starts above parity in 2000 and ends up at almost double their population share by 2014.

Figure 4 provides a view of the opposite end of the income distribution. Whites are under-represented in the bottom 10 percent of the income distribution as their proportion in the overall population would predict. This has not changed much over the 14 years, however, relative to the other races and groups. The remaining race and ethnic groups tend to always be above parity for the bottom of the income distribution. In this regard, only Asian and the Other Race group is above parity at both the top and bottom 10 percent portions of the income distribution, suggesting strong heterogeneity within these two groups.

3.2 Percentile Parity Results by Race and Year

An alternative method to present differences across race and ethnic groups is to show a comparison of the actual dollar incomes that mark the 20th, 40th, and other percentiles for each race and ethnic group compared to Whites. In the next five figures (Figures 5–9), we plot the annual dollar threshold for selected percentiles in the within-group income distributions for all groups, where the value is expressed as a ratio of

Figure 3: Ratio of Top 10 Percent Income Share to Population Share, 2000 and 2014


○ Top 10% in 2000   ● Top 10% in 2014
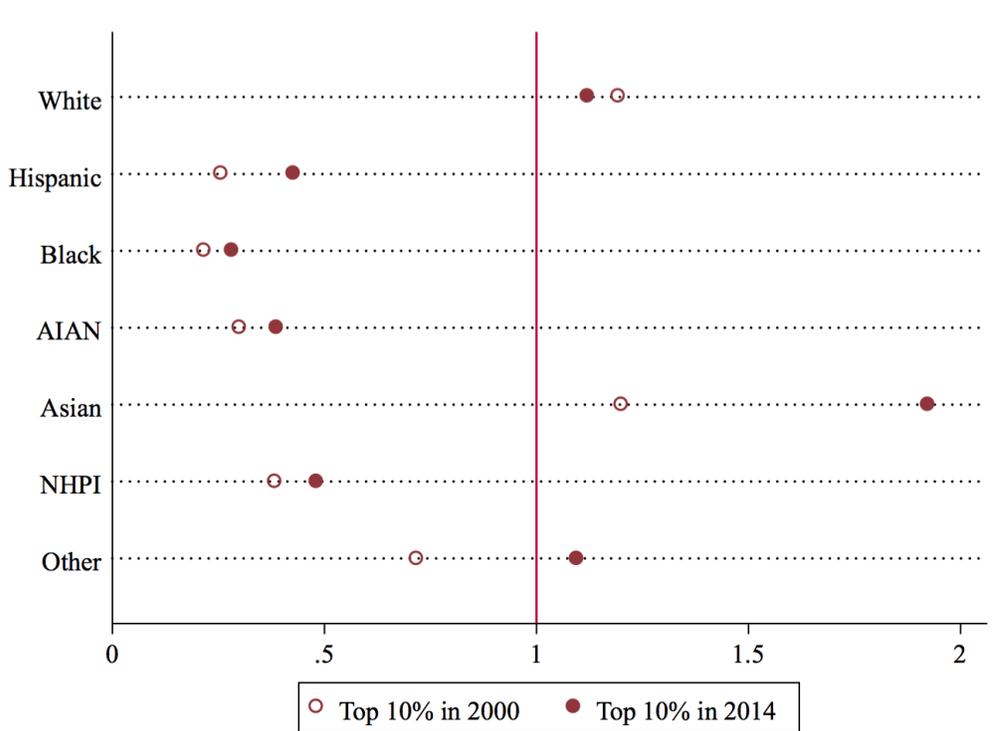
Figure 4: Ratio of Bottom 10 Percent Income Share to Population Share, 2000 and 2014

○ Bottom 10% in 2000   ● Bottom 10% in 2014
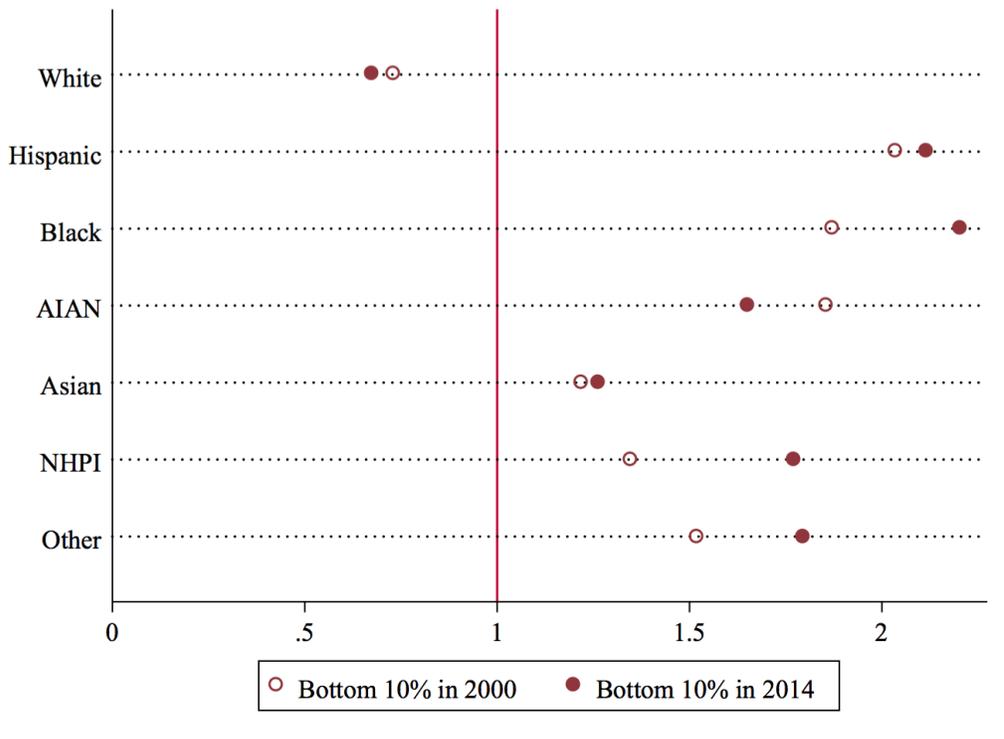
Source: Race and ethnicity file–Form 1040 data, 2000 and 2014.

the group-specific dollar threshold divided by the White threshold. For example, in the year 2000, the dollar amount associated with the 20th percentile of the White income distribution was \$21,160 while the dollar amount associated with the 20th percentile of the Asian distribution in 2000 was just \$16,935. This is an Asian-White ratio of approximately 0.8, which is plotted in Figures 5–9 for each year and reflected in the line labeled "Asian." To continue the example, at the low end of the income distribution—in this case the 20th percentile—the American Indian income level was only \$11,917, which is just 56 percent of the White value.

If a race group were at exact parity with Whites in all years, we would see a horizontal line for that race group at the value of 1. As shown here, all of the groups with the exception of Asians had substantially lower dollar values at their 20th percentile cutoff than the corresponding dollar value at the 20th percentile for Whites.[13] In this figure, Asians experienced gains relative to Whites over the time period. The remaining race and ethnic groups tended to gain somewhat over the period compared to Whites at their respective 20th percentiles; there is some evidence for a decline in the post-Great Recession period for Hispanics, Blacks, and the Other category.

The next figure repeats the analysis at the 40th percentile. The dollar amount associated with the 40th percentile of the Asian income distribution was fairly close to that of the White group at their 40th percentile. The other race and ethnic groups clustered at levels well below parity with Whites for all observed years in our data. Once again, there was a slight downturn for these same groups relative to Whites after the Great Recession.

The third, fourth, and fifth figures provide a similar analysis at the 60th, 80th, and 95th income percentiles, respectively. There continues to be a divergence in the dollar amounts associated with these income percentiles for both Asians and Whites and the rest of the race and ethnic groups in the data. Moreover, Asians began surpassing Whites in the 60th percentile after 2007, and they were above parity with Whites in all years in the 80th and 95th percentiles. All other race and ethnic groups continued to be clustered at lower levels below parity with Whites for all observed years in our data.

A striking result across most of the percentiles is that Blacks, American Indians, and Hispanics had income that is, at best, about two-thirds that of Whites and, at worst, about half the income of Whites.

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[13]The slight bump that occurs for most groups in 2007 is due to the tax rebates that required individuals to file a tax return in order to receive the rebate. Therefore, the year 2007 witnessed a dramatic increase in 1040 tax filers with low or zero incomes (those who would otherwise have not been required to file federal income taxes). The increase in the number of extremely low-income filers necessarily drove down the threshold for the 20th percentile. The results indicate that the filing of tax returns differed by group since the results are all relative to non-Hispanic White. Note that the bump disappears in the subsequent figures after the 40th percentile as the upper income points are less sensitive to changes associated at the bottom of the income distribution.

Figure 5: Income Ratio at the 20th Percentile Relative to White
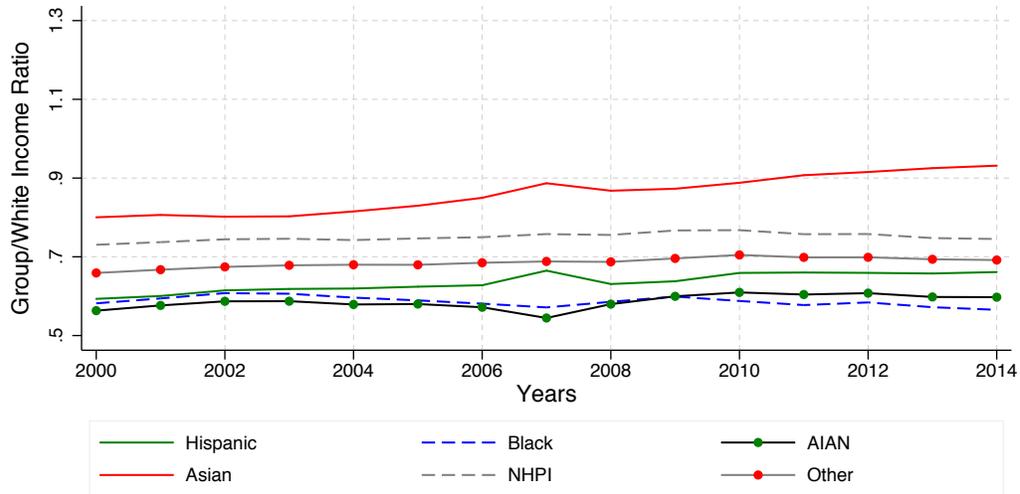
Figure 6: Income Ratio at the 40th Percentile Relative to White
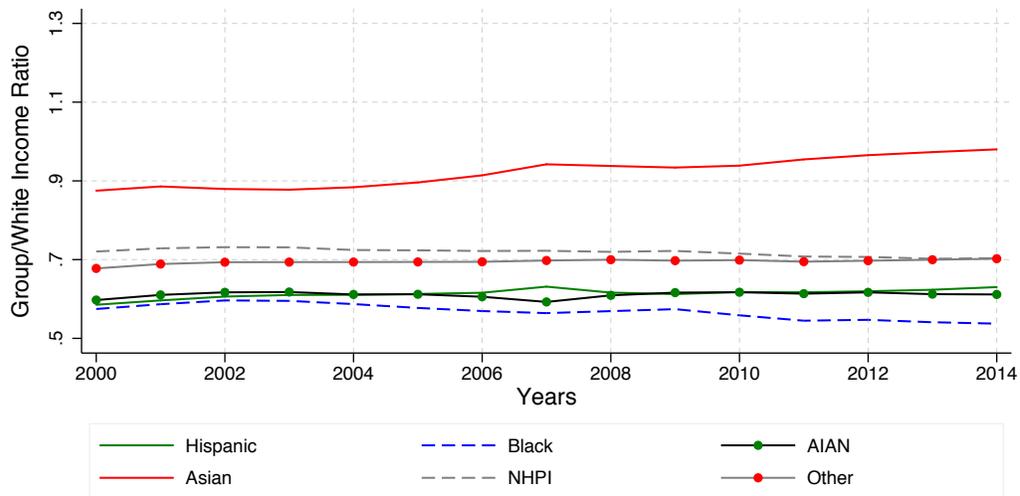
Source: Race and ethnicity file–Form 1040 data, 2000–2014.

The results appear to be constant whether we are examining the low, middle, or high ends of the income distribution. This result suggests that these differences are related to more than just class-based explanations or occupation- and industry-specific effects. The differences appear to persist across these various income

Figure 7: Income Ratio at the 60th Percentile Relative to White
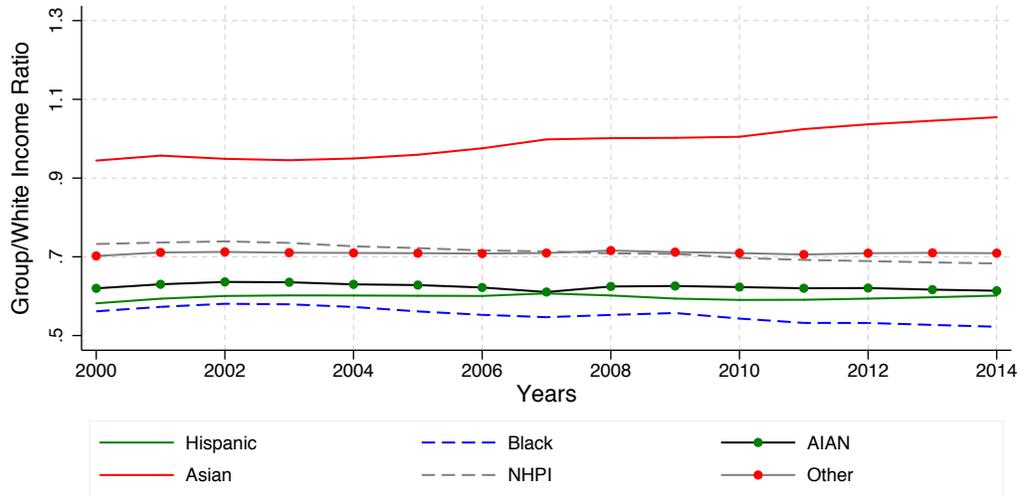
Figure 8: Income Ratio at the 80th Percentile Relative to White
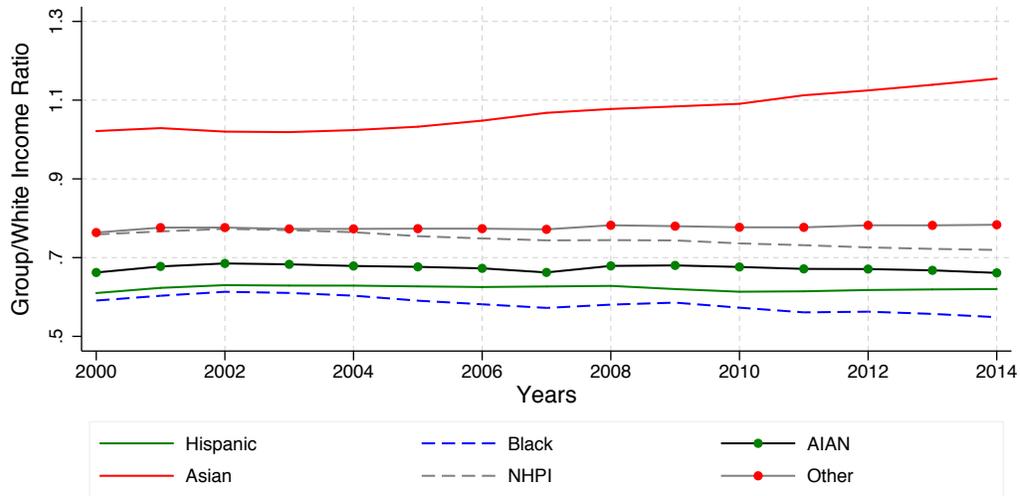
Source: Race and ethnicity file–Form 1040 data, 2000–2014.

percentiles by race. Another noticeable difference is the high rate of income growth relative to Whites for Asians over this time period.

Figure 9: Income Ratio at the 95th Percentile Relative to White
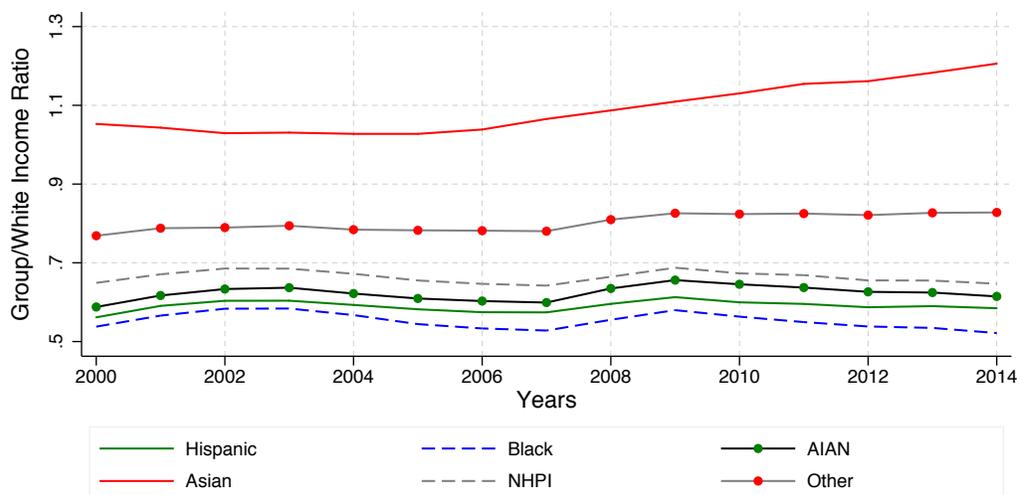
3.3 Measures of Within-Group Inequality Over Time

Figure 10 tracks the annual Gini coefficient for each race and ethnic group. There are three main findings to be taken from this figure. The first is that within-group inequality varies by race and ethnicity. The most unequal groups (the highest Gini coefficients) are Whites, Asians, and the Other group. The Hispanic, Black, American Indian, and Pacific Islander groups tended to have lower levels of within-group inequality for all years compared with the other three groups. These groups, on average, tended to be the poorest groups as well.

The second finding is that levels of within-group inequality increased from 2000 to 2014 for all race and ethnic groups. However, Black, American Indian, Other, and Hispanic within-group inequality increased more over the time period relative to Asian, White, and Pacific Islander within-group inequality. Our third finding is that within-group income inequality decreased for most groups during the recessionary periods. Whites and Asians experienced the largest decrease in within-group inequality during the recessionary periods relative to other groups. We note that the sharp increase in income inequality in 2007 is primarily due to the increase in tax filers for the tax rebates for that year; everyone eligible for the rebate had to file to receive, even if they were not legally required to file because their income was below the filing threshold. Therefore, a large number of individuals with very low or zero income filed taxes, which increased the lower bound of

Figure 10: Gini Ratios by Group for All Years.
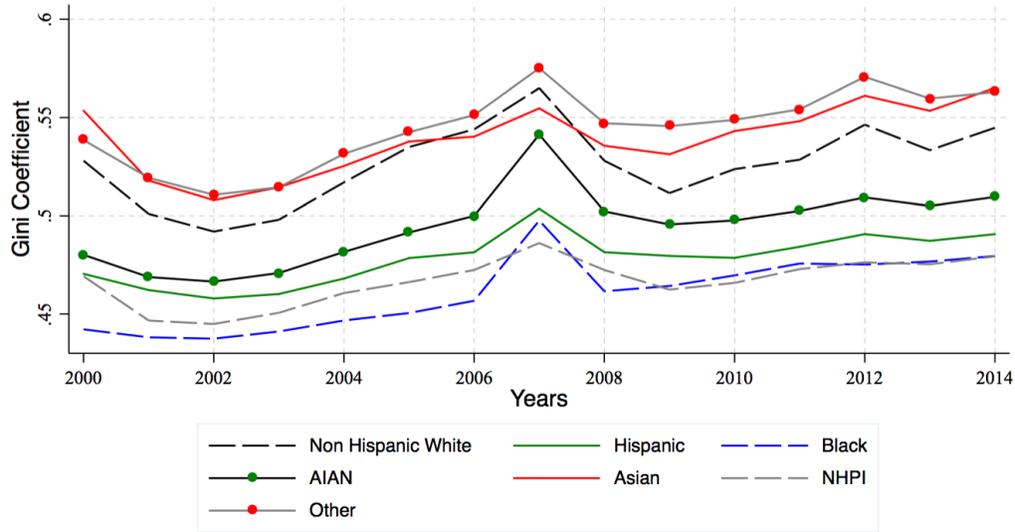
Figure 11: Log Ratio of the 90th and 50th Income Percentiles for Each Year
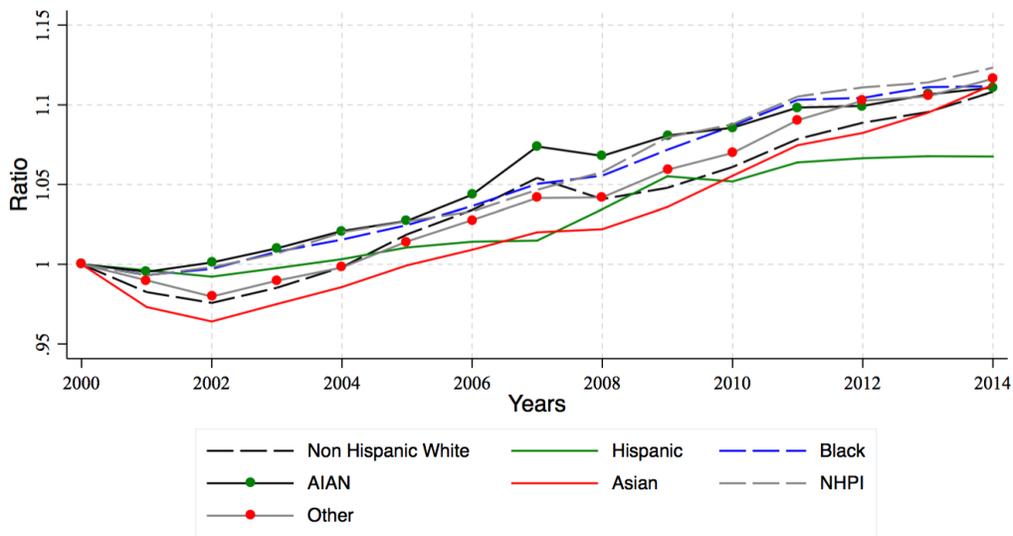
Source: Race and ethnicity file–Form 1040 data, 2000–2014.

incomes for all taxpayers in 2007.

Figure 12: Log Ratio of the 50th and 10th Income Percentiles for Each Year.
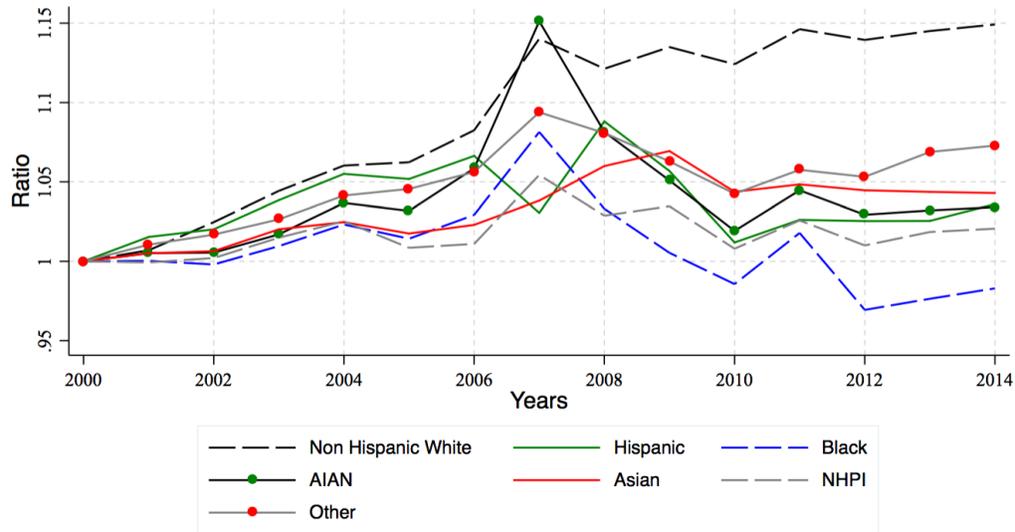
Figure 13: Log Ratio of the 90th and 10th Income Percentiles for Each Year.
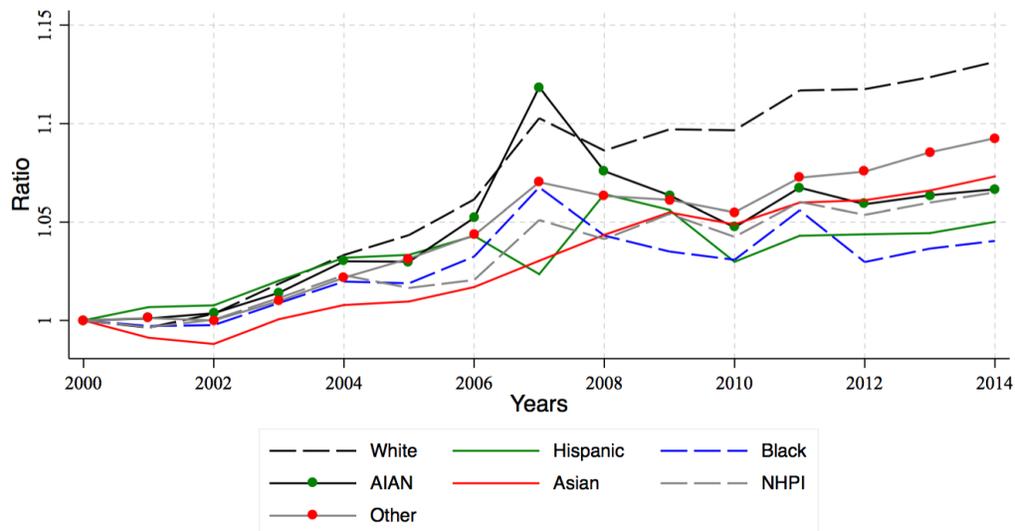
3.4 Within-Group Inequality by Income Deciles

The next set of figures display different parts of the within-group income distribution for each race and ethnic group. We create three figures that plot the log of the ratio for two different income percentiles by

race. The first two figures focus on the top and bottom halves of the income distributions. For the log ratio of the 90th percentile to the 50th percentile, we are able to examine whether inequality in the top half of the income distribution increased or decreased. In a similar fashion, the log ratio of the 50th percentile to the 10th percentile identifies whether there were changes in income inequality at the bottom half of the income distribution. Finally, we plot the logged ratio of the 90th percentile to the 10th percentile for each race or ethnic group by year. This measure indicates whether the top end of the income distribution is moving further away from the bottom end of the income distribution over time. We standardize all of the results by the initial ratio level in 2000 in order to show the progression of the change of the within-group inequality relative to the starting conditions in 2000.

Figure 11 examines the corresponding results for the upper part of the income distribution. In this figure, we plot the log of the ratio of the 90th to the 50th percentile for each race and ethnic group by year. The results indicate that there was an increase in income inequality for all groups over the 15-year time span. All groups experienced a 10 to 13 percent increase in the 90–50 ratio during this period except for Hispanics (7 percent). These results indicate that the rich are becoming richer within each race and ethnic group.

Figure 12 plots the log ratio of the 50th and 10th percentiles for all years in our data. On average most race and ethnic groups in the bottom half of the income distributions experienced little change in the level of income inequality over the period studied. In particular, Blacks appear to have realized a slight reduction in the log ratio of the 50th to 10th income since 2000. Examining the actual income thresholds for these percentiles indicates that this is driven primarily by a rise in the 10th percentile level of income relative to the 50th percentile. For Whites (and the Other race to some extent), the results indicate an increase in the level of income inequality for the bottom half of the income distribution over the 15 years studied; the results indicate that income inequality increased by almost 15 percent between 2000 and 2014 for this group. Examining the actual income thresholds for the 10th and 50th percentiles indicates that the increase in inequality was driven by a distinct drop in the income threshold for the 10th percentile. In this case, the poor are getting poorer over this time period. Note that all of these results are within-group (relative) changes and there are large, persistent absolute differences on average across all of the groups studied in terms income.

In Figure 13, we provide the logged ratio of the 90th percentile to the 10th percentile for each race and ethnic group, which essentially combines the results found in the two previous figures. There is an upward trend in this ratio for all groups over the 15-year period. Inequality within groups appears to have

increased at a relatively constant rate for all groups with the exception of Whites. There was approximately a 3 percent to 7 percent increase in within-group income inequality over this period for all groups other than Whites. In the case of Whites, income inequality increased by almost 12 percent over the 15 years studied. The observed increase is driven by the upward movement of the 90th percentile and the downward movement of the 10th percentile for Whites over this period. Both ends of the income distribution are moving away from each other for this group in particular.

4   Income Immobility

Inequality is not the only component that matters in measures of economic equity: levels of income mobility across race and ethnic groups matters as well. High levels of income immobility, coupled with the increase in income inequality, would tend to further entrench class differences across races. Previous research has shown that, in general, mobility has been stable for much of the previous 25 years (Kopczuk et al., 2010). Mitnik et al. (2016) finds that the increase in income inequality seen in previous decades is associated with a decline in mobility. In this section, we present measures of income mobility (or rather immobility) by race and ethnic origin. Specifically, we analyze three different measures of income mobility: the first measures within-group mobility, and the other two capture mobility for all race and ethnic groups across the full income distribution.

4.1   The Shorrocks Index

A frequently used relative measure of mobility is the Shorrocks Index. This measure allows for a comparison between short- and long-run income inequality. In a society where there is no mobility, long-run income inequality will simply equal short-run inequality. However, with some amount of mobility in society, short-run income inequality will be equal to long-run societal inequality by a factor equal to the mobility measure. Similar to Kopczuk et al. (2010), we use the following equation to describe this relationship:

$$\text{Long-term income inequality} = \text{Short-term income inequality} * (1 - \text{Mobility}) \tag{1}$$

We use the Gini coefficient calculated over several years of income data as our long-term measure of income inequality. In our analysis, we select three years given our 15 years of data available. We define short-term income inequality as the average of three different Gini coefficients calculated for each year

independently. The following equation defines that relationship:[14]

$$G(\overline{Z}) \leq \frac{\sum_{t=1}^{K} G(Z_t)}{K} \times (1 - \text{Mobility})\qquad(2)$$

The Shorrocks Index is the term in parentheses on the right had side of the equal sign. The variable $\overline{Z}$ is the three-year aggregate of income while $K =$ the number of time periods, equal to three in our example. The equation tells us that for a given level of short-run inequality, higher levels of mobility (where Mobility $\in \{0, 1\}$) translate into a lower upper bound for long-run income inequality. In other words, more income mobility means that we should expect less income inequality in the long run if short-run inequality remains relatively stable. Income mobility is generally seen as an important characteristic in measuring and predicting income inequality.

We calculate the Shorrocks Index for each group separately and plot the results in Figure 14. The index is equal to $1 - $ Mobility; therefore, a value close to 1 indicates very low levels of mobility. The index is a relative ranking measure of mobility—in other words, it reflects group-specific mobility, where an individual's income is compared only to income from individuals in the same race or ethnic group. Our findings suggest that, on average, there are very low levels of mobility for all race and ethnic groups in our data. The groups with the lowest levels of within-group mobility tend to be White, Asians, and Other. Hispanics, Blacks, American Indians, and Pacific Islanders display relatively higher levels of within-group income mobility at all years in our data. The Black and American Indian groups in particular experienced higher levels of mobility in the years 2006–2008 than did other groups in our data (potentially due to the effect of the contemporaneous tax rebates), but they quickly return to the same levels as Pacific Islanders by 2009.

4.2 Two-Year Rank Correlations

While the Shorrocks Index measures within-group mobility, we also present an absolute mobility measure using the overall income distribution. We sort individuals, regardless of group membership, by their income in year t and then assign each person a rank in the income distribution according to their location. We then correlate that rank number for an individual with their rank for $t + 1$. If a person does not move very much in the income distribution between the first and second year, then the associated correlation coefficient will approach 1. Alternatively, if the person is mobile in the income distribution (moving either up or down),

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[14]The inequality symbol is due to the convexity of the Gini function and the fact that the function is also homogeneous of degree 0.

Figure 14: Shorrock's Index Measuring Within-group Income Mobility.
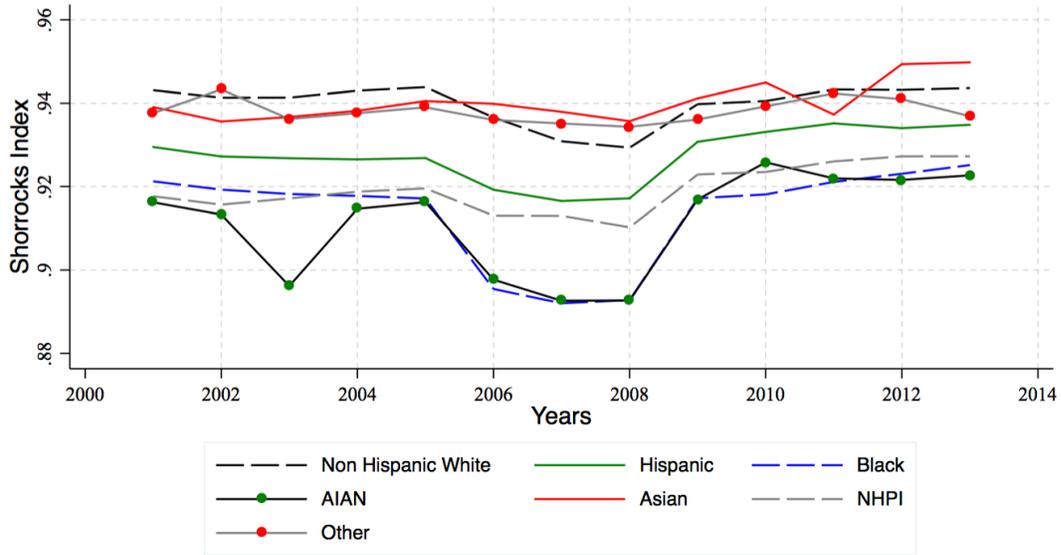
Figure 15: Rank-rank Correlation Measuring Overall Income Mobility.
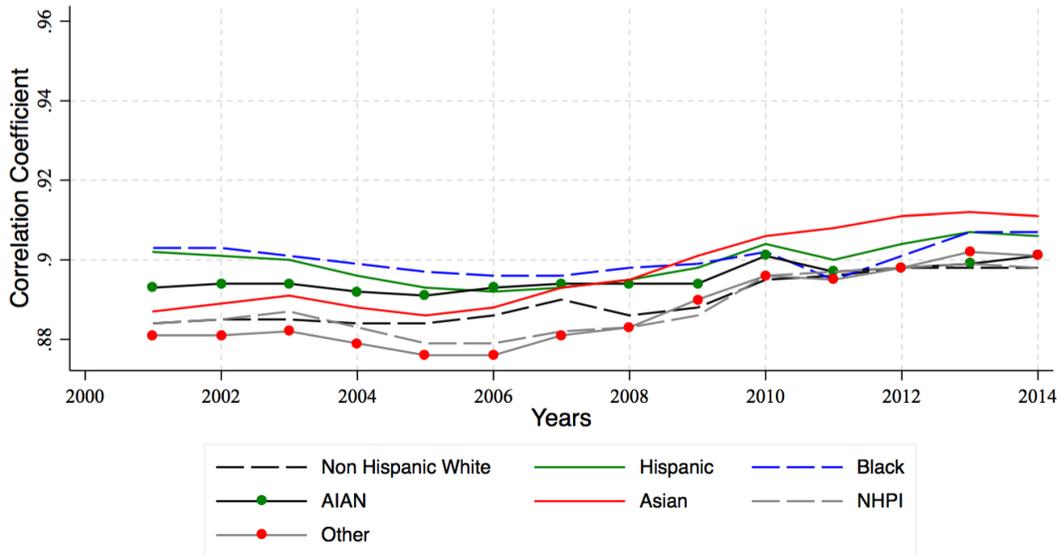
then this correlation will approach zero. Finally, we take the average correlation over all individuals by race or ethnic group. We limit the sample to individuals who appear in the tax data for two consecutive years.

In Figure 15 we provide the correlation coefficients by race and ethnic group by year. There are two points worth noting in this figure. First, there are high levels of immobility in income by race and ethnic group. In fact, it appears that all groups increased in their immobility from 2008 onward. Second, for some groups, immobility varied more when comparing individuals to the entire income distribution than it did when limiting the comparison to individuals from the same group. For example, Blacks were relatively more mobile within their own income distribution when compared with other groups, but until approximately 2010, they experienced the highest rank correlation of any group. Asians experienced the sharpest increase in income immobility over our time period, with Whites, those in the Other group, and Pacific Islanders following closely behind.

4.3   Transition Matrices

An additional method to examine income mobility is the use of transition matrices for individuals at two points in time (Bloome, 2014). We restrict our sample to individuals who are present in the first year of our data and at the final year of our data (years 2000 and 2014).[15] We identify the income quintiles (a total of five bins) in 2000 for all individuals in our selected sample. Then we identify the same person's location in the income quintile in 2014. We calculate the probability, by group, that a person will be in a given quintile at the end of the period based on the starting quintile. These probabilities are shown in transition matrices in Figures 16 Panels A-G. The first figure presents the results for Whites. The income quintiles for 2000 are given across the five rows and the income quintiles for 2014 are given across the columns. We arrange the quintiles in order from lowest to highest along a 1–5 ordering. The darkness of the shaded squares indicates a higher probability of being in a particular cell. The results are calculated based on row probabilities. For example, the first cell in Figure 16 Panel A is 44.15, which means that about 44 percent of Whites who started out in the first (lowest) income quintile in 2000 remained in the lowest income quintile in 2014. Along the diagonal, we observe that there is a high probability of remaining in the same income quintile over time. Individuals who start out in the highest income quintile are the most likely to remain there: we find that 55 percent of Whites remained in that same position in the income distribution. These results suggest strong immobility for upper-income Whites. There is a very small likelihood of low-income Whites moving

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[15]We restrict our analysis in Appendix Figures A1 through A7 to the years 2005-2014 and add individuals who have W2 earnings but do not file a 1040 form. This robustness check allows us to evaluate whether there is a significant difference when these individuals are included in the analysis. There are no strong qualitative (or quantitative) differences across the transition matrices with and without the additional individuals who were identified from using the W2 forms.

up to the highest income quintiles by 2014 (less than 5 percent). We also observe evidence of people sliding back—moving to lower quintiles from 2000 to 2014.

All race groups follow this general pattern, with high probabilities of immobility across quintiles, very high immobility in the lowest and highest income quintiles, and people sliding back to lower quintiles. However, the levels vary across race and ethnic groups. Asians exhibit the highest level of immobility at the highest quintile, where 61.5 percent were in the fifth quintile in both 2000 and 2014. Asians experience the greatest mobility in quintiles two through four relative to other groups. For these quintiles, while many Asians are sliding backwards, a greater proportion of Asians moved up in comparison with other groups.

Blacks have the highest level of immobility in the bottom quintile compared to all other groups: strikingly, 60 percent of Blacks who started in the lowest income quintile in 2000 remained in the lowest quintile in 2014. About 33 percent of Blacks who started in the second quintile in 2000 remained in that quintile in 2014; only Hispanics have a higher level of immobility in the second quintile at 35 percent. Conversely, Blacks had the lowest percentage of people relative to other race and ethnic groups that remained in the highest quintile from 2000 to 2014: 45 percent. Blacks and Hispanics were also more likely to slide back to lower quintiles compared to Whites and Asians. Twenty-nine percent of Blacks and Hispanics who started out in the second quintile in 2000 slid to the first quintile in 2014. Moreover, 41 percent of Blacks who started out in the third quintile in 2000 fell to the first or second quintiles by 2014. In other words, 69 percent of Blacks who started in the third quintile in 2000 were either immobile (28 percent) or downwardly mobile (41 percent).

Generally, all other race groups fall in between Whites and Asians on one hand, and Blacks on the other. Immobility and downward mobility patterns for Hispanics and American Indians more closely resemble those of Blacks and the Other group, while the pattern for Pacific Islanders more closely resembles those of Whites and Asians. To our knowledge, the stark differences in mobility patterns seen when comparing groups to one another is a new finding in the literature.

5 Conclusion

Our analysis examines incomes for the universe of tax filers for the U.S. over the period 2000 to 2014 by race and ethnic group. To our knowledge, we are the first to be able to provide in-depth analysis of relatively smaller race and ethnic groups, overcoming the limitations of survey data or administrative records used separately. Through the use of restricted IRS tax data and U.S. Census race and ethnicity data, we have

Figure 16: Transition Matrices for All Races and Ethnicities between 2000 and 2014.

Panel A: White

	NHW	2014 1	2	3	4	5
2000	1	44.15	28.46	15.02	8.00	4.37
	2	21.22	30.87	26.35	15.27	6.29
	3	12.17	20.98	29.14	25.86	11.85
	4	7.80	12.91	22.51	32.15	24.63
	5	4.84	6.34	10.99	22.36	55.47

Panel B: Hispanic

	Hispa nic	2014 1	2	3	4	5
2000	1	58.81	27.04	9.16	3.58	1.41
	2	29.55	34.63	21.78	10.49	3.54
	3	16.78	25.04	27.85	21.56	8.77
	4	10.14	15.63	23.30	30.33	20.60
	5	6.10	7.82	12.61	24.04	49.43

Panel C: Black

	Black	2014 1	2	3	4	5
2000	1	60.27	25.20	9.33	3.93	1.27
	2	28.97	32.88	22.13	12.12	3.90
	3	16.93	24.47	27.66	22.21	8.73
	4	10.59	15.63	23.42	31.24	19.12
	5	6.46	8.39	13.44	26.68	45.03

Panel D: AIAN

	AIAN	2014 1	2	3	4	5
2000	1	56.14	26.11	10.96	4.84	1.95
	2	27.58	31.74	23.36	12.75	4.57
	3	16.66	23.53	27.61	22.49	9.71
	4	11.19	15.28	23.23	29.71	20.59
	5	7.07	8.46	13.03	24.57	46.86

Panel E: Asian

	Asian	2014 1	2	3	4	5
2000	1	51.10	22.38	11.44	7.83	7.25
	2	26.47	29.13	21.36	13.72	9.32
	3	14.77	21.03	25.63	23.35	15.21
	4	8.56	11.94	19.48	29.96	30.07
	5	5.09	5.16	8.92	19.34	61.50

Panel F: NHPI

	NHPI	2014 1	2	3	4	5
2000	1	50.28	27.79	13.28	6.26	2.39
	2	24.71	30.98	24.69	14.38	5.25
	3	14.42	22.74	27.78	24.52	10.55
	4	9.29	14.16	23.20	31.36	21.99
	5	5.76	7.90	12.55	25.19	48.60

Panel G: Other

	Other	2014 1	2	3	4	5
2000	1	53.96	25.26	11.27	5.86	3.65
	2	28.53	30.51	21.84	12.54	6.58
	3	17.33	21.87	26.50	21.99	12.31
	4	11.28	13.87	20.79	29.05	25.00
	5	6.91	7.02	10.51	20.04	55.52

Figure 16 Panels A-G: Transition matrices showing probability of arriving in quantile in 2014 from quantile in 2000.
Source: Race and ethnicity file–Form 1040 data, 2000 and 2014.

created a novel data set that allows for an examination of annual incomes, income inequality, income shares, and income mobility by race and Hispanic origin.

We find, as expected, that there are large differences in income shares across race and ethnic groups over this time period. What is more startling is the persistence of disadvantage of certain minority groups relative to Whites at every point in the income distribution. Whites and Asians tend to accrue higher income shares at all points in time, especially towards the end of our time period. Asians occupy a unique position and have more than their proportionate population share of income both at the top and the bottom of the income distribution. Blacks, Hispanics, and American Indians tend to be clustered at the low end of the income distribution across all years, while Pacific Islanders and our Other group are slightly higher than these groups but still never at parity with Whites and Asians.

Within-group inequality analysis shows that for all races, individuals at the 90th percentile gained income at a pace that far surpassed that of the 50th percentile. While there were some differences across race and ethnic groups in intensity, this pattern held for each group. Additionally, we find that that for most groups the log 50th/10th ratio remained mostly constant except for Whites. This suggests that the upper half of the income distribution for all race and ethnic groups is becoming less equal, and the bottom half remains mostly unchanged. Notable differences are for Whites which are experiencing an increase in both the top and bottom half of the income distribution; the bottom change is being driven primarily by a reduction of the threshold level of income for the 10th percentile. For Blacks we find that there is a reduction in inequality for the bottom half of the distribution driven primarily by an increase in the threshold level of income for the 10th percentile over time.

Using several different measures, we calculate income mobility across race and ethnic groups in the U.S. Our findings indicate that there is a high level of immobility for all groups in general. We find differences in mobility for different groups: Blacks, Hispanics, and American Indians have lower levels of overall mobility compared with Asians. However, these same groups have the highest levels of mobility within their own groups. This indicates that there is movement within each of the relatively poorer groups in our data, but such movement is confined to the lower end of the overall income distribution.

By our measures, the race and ethnic groups with generally high levels of income also tend to have the highest measures of inequality and within-group immobility. The evidence that high-income groups are less mobile and more unequal will be useful in thinking about how to alleviate persistent poverty in certain race and ethnic groups. Mobility by itself is not the solution when it results in movement only within the lowest parts of the respective income distribution. Additionally, income inequality can mask changes in

different parts of the income distribution. Blacks have witnessed a slight increase in income inequality as measured by a standard Gini coefficient; however, there are stark differences at different points within the income distribution. Income inequality for this group has increased in the log 90th/50th income ratio while there has been a reduction in the log 50th/10th income ratio. The overall Gini increases obscure important changes occurring within the upper and lower part of each group-specific income distribution.

Our results tell the following story about income inequality and mobility by race and ethnic groups. First, Whites and Asians simply have more income than other groups at every point in the income distribution. Second, Whites, Asians, and those in the Other group experience both higher income inequality and income immobility when looking at within-group measures. Third, while within-group measures for lower-income groups, such as Black, Hispanic, American Indian, and Pacific Islanderi ndicate lower within-group inequality, this is more due to individuals being clustered at the low end of the overall income distribution. Finally, when looking at this overall distribution, low-income groups start the period with high levels of immobility; higher-income groups, however, eventually catch up in this measure. This picture that emerges is of a rigid distribution of income, with Whites, Asians, and, to a lesser extent, those in the Other group protected at the top and all other groups confined to the bottom. These results suggest that race and ethnicity continue to play a central role in explaining the persistence of inequality and income immobility.

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A Appendix

A.1 Income Shares

Table A1: Income Shares by Race and Ethnic Group, 2000 to 2014

Panel A: Population share of race or ethnic group

Year	White	Hispanic	Black	AIAN	Asian	NHPI	Other
2000	75.13%	9.61%	9.72%	0.84%	4.37%	0.17%	0.18%
2001	74.70%	9.91%	9.73%	0.84%	4.47%	0.17%	0.18%
2002	74.26%	10.21%	9.73%	0.84%	4.59%	0.17%	0.18%
2003	73.85%	10.46%	9.76%	0.84%	4.72%	0.18%	0.19%
2004	73.41%	10.69%	9.84%	0.84%	4.84%	0.18%	0.19%
2005	73.18%	10.73%	9.90%	0.87%	4.94%	0.19%	0.19%
2006	72.72%	11.03%	9.94%	0.90%	5.03%	0.19%	0.20%
2007	72.33%	11.95%	9.47%	1.29%	4.59%	0.21%	0.16%
2008	71.63%	11.53%	10.20%	0.92%	5.31%	0.20%	0.20%
2009	71.18%	11.76%	10.25%	0.90%	5.49%	0.21%	0.21%
2010	70.66%	12.02%	10.45%	0.90%	5.55%	0.21%	0.22%
2011	70.40%	12.19%	10.52%	0.91%	5.55%	0.21%	0.22%
2012	70.32%	12.27%	10.47%	0.89%	5.62%	0.22%	0.22%
2013	69.94%	12.47%	10.59%	0.87%	5.68%	0.22%	0.23%
2014	69.48%	12.79%	10.67%	0.85%	5.74%	0.22%	0.23%

Panel B: Income Share for Top 10 Percent

Year	Overall Total	As a Percent of Row Total						
		White	Hispanic	Black	AIAN	Asian	NHPI	Other
2000	40.79%	89.73%	2.46%	2.11%	0.25%	5.26%	0.07%	0.13%
2001	37.46%	88.94%	2.79%	2.49%	0.27%	5.30%	0.06%	0.14%
2002	36.22%	88.43%	2.98%	2.79%	0.29%	5.29%	0.07%	0.14%
2003	36.70%	88.24%	3.03%	2.81%	0.30%	5.41%	0.07%	0.14%
2004	38.62%	88.39%	3.06%	2.62%	0.29%	5.42%	0.07%	0.15%
2005	40.55%	88.34%	3.20%	2.39%	0.30%	5.55%	0.07%	0.15%
2006	41.30%	88.21%	3.20%	2.34%	0.30%	5.73%	0.07%	0.15%
2007	42.14%	87.71%	3.23%	2.39%	0.30%	6.13%	0.07%	0.16%
2008	39.00%	86.42%	3.55%	2.78%	0.34%	6.65%	0.08%	0.17%
2009	36.90%	84.97%	3.85%	3.26%	0.35%	7.30%	0.08%	0.19%
2010	38.22%	84.96%	3.79%	3.15%	0.34%	7.49%	0.08%	0.19%
2011	38.52%	84.70%	3.87%	3.04%	0.34%	7.78%	0.08%	0.19%
2012	40.61%	85.02%	3.84%	2.77%	0.33%	7.76%	0.08%	0.20%
2013	39.05%	84.20%	4.06%	2.91%	0.33%	8.21%	0.08%	0.20%
2014	40.31%	84.13%	4.10%	2.76%	0.33%	8.40%	0.08%	0.20%

Table A1

Panel C: Income Share for Top 1 Percent

		As a Percent of Row Total						
Year	Overall Total	White	Hispanic	Black	AIAN	Asian	NHPI	Other
Year	Overall Total	White	Hispanic	Black	AIAN	Asian	NHPI	Other
2000	17.87%	92.10%	1.88%	0.97%	0.19%	4.67%	0.06%	0.13%
2001	14.53%	92.09%	2.15%	1.19%	0.20%	4.19%	0.05%	0.14%
2002	13.31%	91.88%	2.27%	1.31%	0.21%	4.15%	0.05%	0.14%
2003	13.76%	91.80%	2.22%	1.25%	0.21%	4.34%	0.05%	0.14%
2004	15.65%	91.95%	2.22%	1.16%	0.21%	4.25%	0.05%	0.15%
2005	17.45%	91.72%	2.45%	1.05%	0.22%	4.36%	0.05%	0.14%
2006	18.04%	91.78%	2.41%	1.04%	0.22%	4.33%	0.06%	0.15%
2007	18.45%	91.30%	2.40%	1.06%	0.22%	4.81%	0.05%	0.16%
2008	15.61%	90.32%	2.68%	1.26%	0.27%	5.23%	0.07%	0.17%
2009	13.28%	88.67%	2.99%	1.64%	0.28%	6.15%	0.06%	0.21%
2010	14.60%	88.69%	2.85%	1.58%	0.26%	6.37%	0.05%	0.19%
2011	14.57%	88.47%	2.95%	1.44%	0.25%	6.64%	0.06%	0.20%
2012	16.80%	88.78%	2.92%	1.31%	0.25%	6.48%	0.05%	0.20%
2013	14.79%	87.94%	3.11%	1.48%	0.25%	6.96%	0.05%	0.20%
2014	16.01%	87.83%	3.13%	1.39%	0.25%	7.16%	0.05%	0.19%

Panel B: Income Share for Top 0.1 Percent

		As a Percent of Row Total						
Year	Overall Total	White	Hispanic	Black	AIAN	Asian	NHPI	Other
2000	8.85%	92.53%	1.65%	0.95%	0.16%	4.54%	0.06%	0.12%
2001	6.62%	92.78%	1.93%	1.28%	0.15%	3.68%	0.04%	0.14%
2002	5.83%	92.79%	2.01%	1.40%	0.16%	3.45%	0.05%	0.14%
2003	6.15%	92.88%	1.84%	1.31%	0.15%	3.63%	0.05%	0.13%
2004	7.34%	93.02%	1.91%	1.14%	0.16%	3.55%	0.06%	0.16%
2005	8.43%	92.61%	2.21%	0.98%	0.18%	3.83%	0.05%	0.14%
2006	8.73%	92.83%	2.10%	1.01%	0.17%	3.67%	0.06%	0.15%
2007	8.98%	92.32%	2.07%	0.99%	0.17%	4.23%	0.05%	0.18%
2008	7.32%	91.48%	2.34%	1.21%	0.24%	4.45%	0.07%	0.19%
2009	5.82%	89.67%	2.72%	1.78%	0.26%	5.25%	0.05%	0.27%
2010	6.73%	89.85%	2.52%	1.68%	0.23%	5.45%	0.05%	0.22%
2011	6.59%	89.66%	2.61%	1.40%	0.22%	5.83%	0.05%	0.22%
2012	8.01%	89.76%	2.61%	1.28%	0.23%	5.85%	0.04%	0.23%
2013	6.60%	89.14%	2.77%	1.48%	0.22%	6.13%	0.04%	0.22%
2014	7.35%	89.10%	2.75%	1.37%	0.21%	6.35%	0.04%	0.18%

Panel D: Income Share for Bottom 10 Percent

		As a Percent of Row Total						
Year	Overall Total	White	Hispanic	Black	AIAN	Asian	NHPI	Other
2000	1.18%	54.85%	19.57%	18.20%	1.56%	5.32%	0.23%	0.27%
2001	1.24%	55.04%	19.63%	17.85%	1.54%	5.43%	0.24%	0.27%
2002	1.24%	55.47%	19.41%	17.48%	1.50%	5.62%	0.24%	0.28%
2003	1.20%	55.46%	19.35%	17.38%	1.48%	5.81%	0.25%	0.28%
2004	1.14%	55.07%	19.36%	17.69%	1.49%	5.86%	0.25%	0.28%

2005	1.09%	54.46%	19.49%	18.09%	1.48%	5.93%	0.25%	0.29%
2006	1.04%	53.99%	19.62%	18.37%	1.47%	6.00%	0.26%	0.29%
2007	0.61%	54.77%	19.00%	18.20%	1.56%	5.91%	0.26%	0.30%
2008	1.02%	53.73%	19.83%	18.25%	1.43%	6.19%	0.27%	0.30%
2009	1.07%	53.53%	20.38%	17.84%	1.40%	6.27%	0.27%	0.31%
2010	1.08%	52.69%	20.26%	18.92%	1.39%	6.15%	0.28%	0.31%
2011	1.02%	52.49%	20.12%	19.42%	1.39%	5.98%	0.29%	0.31%
2012	1.01%	51.94%	20.22%	20.00%	1.38%	5.86%	0.29%	0.32%
2013	1.02%	51.26%	20.29%	20.76%	1.38%	5.68%	0.30%	0.32%
2014	0.98%	50.69%	20.34%	21.43%	1.39%	5.53%	0.30%	0.32%

Panel B: Income Share for Bottom 1 Percent

		As a Percent of Row Total						
Year	Overall Total	White	Hispanic	Black	AIAN	Asian	NHPI	Other
2000	0.02%	59.97%	12.87%	19.44%	2.00%	5.20%	0.24%	0.27%
2001	0.02%	61.43%	12.58%	18.52%	1.88%	5.06%	0.24%	0.26%
2002	0.01%	63.81%	11.86%	16.91%	1.85%	5.08%	0.23%	0.26%
2003	0.01%	64.90%	11.65%	15.85%	1.82%	5.30%	0.25%	0.27%
2004	0.01%	65.36%	11.54%	15.39%	1.83%	5.40%	0.23%	0.27%
2005	0.01%	65.28%	11.76%	15.27%	1.86%	5.29%	0.25%	0.29%
2006	0.01%	67.19%	11.46%	13.82%	1.76%	5.32%	0.24%	0.29%
2007								
2008	0.00%	68.10%	11.23%	12.93%	1.55%	5.55%	0.24%	0.28%
2009	0.00%	68.87%	10.91%	12.37%	1.53%	5.88%	0.24%	0.27%
2010	0.01%	68.77%	10.47%	12.93%	1.56%	5.64%	0.24%	0.28%
2011	0.00%	68.37%	10.77%	13.38%	1.38%	5.64%	0.23%	0.30%
2012	0.01%	67.81%	11.19%	13.35%	1.54%	5.53%	0.24%	0.27%
2013	0.01%	66.93%	11.65%	13.92%	1.59%	5.35%	0.24%	0.30%
2014	0.00%	66.60%	11.87%	13.99%	1.50%	5.44%	0.24%	0.30%

Source: Race and ethnicity file–Form 1040 data, 2000 to 2014.

A.2 Robustness Checks using Transition Matrices

The preceding analysis employed AGI reported on the Form 1040 for the income measure, thus limiting the analysis to tax filers. This choice of sample may bias our reported estimates due to the loss of information on non-filers and non-earners who are working age, since race and ethnic origin are correlated with tax filing. This bias may be especially problematic in the case of the transition matrices, where upward or downward mobility may be impacted by individuals who have zero earnings in the first period and positive earnings in the later period, and vice versa. If these types of transitions vary by group, transition matrices without information on these types of transitions may lead to erroneous comparisons. We address this concern using two further analyses: first, we add observations from W-2 data to the race and ethnicity file when these W-2 recipients do not file a 1040; and second, we look at the universe of working age men in the 2000 and 2010

NHW	1	2	3	4	5
1	50.37	27.92	12.26	6.08	3.36
2	21.04	36.10	26.40	11.98	4.48
3	10.07	20.86	34.31	25.75	9.00
4	5.61	10.46	22.58	38.01	23.34
5	3.27	4.45	8.53	21.66	62.09

Hispanic	1	2	3	4	5
1	64.18	25.09	7.10	2.62	1.02
2	29.13	39.85	21.00	7.78	2.24
3	14.26	26.05	32.63	20.79	6.27
4	7.81	13.68	24.28	35.42	18.81
5	4.66	6.06	10.59	24.06	54.63

Black	1	2	3	4	5
1	65.81	23.43	7.16	2.72	0.89
2	29.00	37.95	21.62	9.04	2.38
3	14.29	24.92	32.45	21.84	6.51
4	7.72	13.13	24.08	36.86	18.21
5	4.12	5.78	10.66	26.65	52.79

AIAN	1	2	3	4	5
1	62.24	24.77	8.47	3.27	1.25
2	27.61	37.18	22.92	9.55	2.75
3	14.02	24.13	32.52	22.18	7.15
4	8.32	12.96	23.99	35.36	19.37
5	4.65	5.98	10.67	24.75	53.95

Asian	1	2	3	4	5
1	56.51	22.47	9.70	6.13	5.19
2	24.74	33.50	22.25	11.95	7.56
3	11.45	20.27	30.48	24.79	13.01
4	5.88	9.23	19.13	35.33	30.43
5	3.40	3.59	6.61	17.72	68.67

NHPI	1	2	3	4	5
1	58.67	26.28	9.65	3.81	1.58
2	26.18	36.64	23.71	10.32	3.15
3	12.91	23.06	32.74	23.76	7.54
4	6.91	12.90	22.92	36.88	20.39
5	4.20	5.86	10.55	25.10	54.29

Other	1	2	3	4	5
1	58.78	24.37	9.45	4.59	2.81
2	28.73	34.63	21.73	10.21	4.71
3	14.57	22.61	30.33	22.50	9.99
4	8.44	12.15	20.99	34.08	24.35
5	5.03	5.28	8.64	19.31	61.74

Figure A1 through A7: Transition matrices showing probability of arriving in quantile in 2014 from quantile in 2005.
Source: Race and ethnicity file–Form 1040 data, 2005 and 2014.

decennial censuses, linking them to their 1040 information as before and setting any observation without a 1040 to zero AGI.

In the case of the W-2 data, we do not know what dependents—if any—a person might claim, nor do we know marital status. For the earners in the W-2, we assign a 1 as the equivalency scale and the sum of W-2 wage and salary earnings as income. W-2 data are available only from 2005 forward. For the sake of comparison, we show transition matrices between 2005 and 2014 using both our main data and the data including the W-2 in this appendix.

Because of the shorter time frame, individuals are more "fixed" in position in the distribution compared with the 15-year span of data in the main results. However, patterns by group remain similar to those seen in the main data, with only slight changes in values in comparable cells. Not surprisingly, the inclusion of W2 data has the most impact for each group at the low end of the distribution, appearing to move the

NHW	1	2	3	4	5
1	49.87	27.53	12.54	6.41	3.65
2	21.38	35.65	26.28	12.06	4.64
3	10.33	20.60	34.24	25.74	9.10
4	5.81	10.35	22.33	38.05	23.46
5	3.45	4.50	8.52	21.60	61.94

Hispanic	1	2	3	4	5
1	59.72	26.69	8.53	3.46	1.60
2	28.74	39.96	21.07	7.89	2.34
3	14.59	26.00	32.53	20.54	6.33
4	8.42	13.88	24.11	34.97	18.62
5	5.31	6.43	10.79	23.89	53.59

Black	1	2	3	4	5
1	63.90	24.16	7.83	3.07	1.03
2	29.21	37.63	21.61	9.09	2.46
3	15.21	25.00	32.03	21.27	6.50
4	8.82	13.51	23.93	35.91	17.84
5	5.30	6.21	10.84	26.08	51.57

AIAN	1	2	3	4	5
1	61.75	24.55	8.78	3.51	1.41
2	28.69	36.46	22.60	9.43	2.81
3	15.06	24.14	32.12	21.65	7.04
4	9.30	13.27	23.62	34.78	19.04
5	5.51	6.35	10.83	24.60	52.72

Asian	1	2	3	4	5
1	53.93	23.51	10.24	6.59	5.73
2	24.21	33.73	22.31	11.97	7.77
3	11.36	20.21	30.63	24.67	13.13
4	5.87	9.18	19.01	35.25	30.68
5	3.45	3.65	6.58	17.54	68.78

NHPI	1	2	3	4	5
1	55.90	27.10	10.61	4.42	1.97
2	26.48	36.07	23.72	10.47	3.27
3	13.49	23.12	32.51	23.22	7.65
4	7.78	13.00	22.93	36.12	20.17
5	4.84	6.33	10.88	24.84	53.11

Other	1	2	3	4	5
1	56.86	24.94	10.02	5.04	3.15
2	28.64	34.84	21.60	10.19	4.73
3	14.84	23.08	30.15	22.09	9.84
4	8.83	12.08	21.18	33.52	24.38
5	5.47	5.41	8.82	19.31	60.99

Figure A8 through A14: Previous sample plus W-2 non-filer observations. Transition matrices showing probability of arriving in quantile in 2014 from quantile in 2005.
Source: Race and ethnicity file–Form 1040–W-2 data, 2005 and 2014.

proportion of observations who were in the lowest quintile in each year into higher quintiles (this is with the exception of American Indian, where those in the second quintile at the start appear to also move down).

For the final set of matrices, we took decennial census data from 2000 and 2010 and selected all men between the ages of 25 and 65 in each year. We then linked these men to 1040 data as before, but retained the observations not found in the 1040 data and set AGI to zero. We also set AGI to zero for observations found in the 1040 who had AGI less than zero (in the main analysis, these observations were dropped). Our choice of men aligns this analysis more closely with traditional economic research on labor market participation and wage inequality. The years chosen allow us to make statements based on two point-in-time populations of working-age men (2000 and 2010). In other words, while 2014 is the final year in the main analysis, there is no corresponding complete population from which to select the population of men—thus we use 2000.

Allowing men of working age to have zero earnings in either period may give a more complete picture of transitions from one period to the next. Comparing these matrices to those reported in the main analysis indicates that the stark differences we find between Whites and lower-income minority groups may be understated. Whites show a slightly greater probability of upward mobility, while Blacks show an even more pronounced downward mobility and stagnation in the first quintile. The picture for Hispanics is slightly better than for Blacks, but both this group and American Indians also show evidence of greater downward mobility into lower quintiles. Pacific Islanders and those in the Other category show a greater dispersion into both higher and lower quintiles, while Asians show slightly higher upward mobility.

The preceding results highlight the advisability of including observations with zero income, when possible, to income inequality studies. However, this opens up questions on who should be included as a potential income earner and who should not, and from what data sources we can expect to gain insight into whom should be included and whom excluded. We leave these questions for future research.

NHW	1	2	3	4	5
1	54.91	23.77	10.24	6.19	4.89
2	18.48	36.32	28.84	12.35	4.01
3	9.99	18.88	33.29	28.14	9.71
4	6.91	10.59	21.14	35.84	25.52
5	6.01	5.52	9.47	20.78	58.21

Hispanic	1	2	3	4	5
1	49.55	36.61	8.44	3.53	1.87
2	19.14	48.21	23.24	7.50	1.92
3	12.63	25.49	32.29	22.62	6.98
4	9.62	13.69	22.36	32.97	21.35
5	8.35	6.71	10.86	21.84	52.24

Black	1	2	3	4	5
1	66.00	20.18	7.46	4.19	2.17
2	28.60	37.19	22.15	9.43	2.63
3	17.84	21.96	29.49	23.01	7.70
4	13.37	12.41	20.67	32.65	20.90
5	10.97	6.65	10.77	22.61	48.99

AIAN	1	2	3	4	5
1	65.57	22.50	7.03	3.22	1.68
2	26.98	37.23	23.75	9.41	2.62
3	16.81	20.97	30.01	24.17	8.04
4	11.56	12.76	20.78	32.38	22.52
5	9.51	7.02	10.99	21.96	50.52

Asian	1	2	3	4	5
1	40.13	34.46	10.84	7.17	7.40
2	16.29	41.26	24.53	11.37	6.56
3	9.21	21.90	30.95	25.40	12.54
4	6.45	10.39	19.27	33.49	30.41
5	5.53	4.54	7.89	18.47	63.57

NHPI	1	2	3	4	5
1	53.06	28.42	10.51	5.47	2.54
2	21.44	36.99	27.01	11.57	3.00
3	14.37	20.48	31.14	25.33	8.68
4	10.19	11.46	21.01	33.83	23.52
5	10.20	6.64	10.57	22.36	50.22

Other	1	2	3	4	5
1	56.86	24.94	10.02	5.04	3.15
2	28.64	34.84	21.60	10.19	4.73
3	14.84	23.08	30.15	22.09	9.84
4	8.83	12.08	21.18	33.52	24.38
5	5.47	5.41	8.82	19.31	60.99

Figure A15 through A21: Working-age men in the 2000 and 2010 census. Transition matrices showing probability of arriving in quantile in 2010 from quantile in 2000.
Source: 2000 Census and Census 2010–Form 1040 data, 2000 and 2010.