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On the Evolution of Income Inequality in the United States

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The recent rise in income inequality in the United States has received considerable attention in policy debates.[1] This article discusses individual income inequality trends. In doing so, we summarize results presented in existing work. As in previous studies, the article shows that income inequality has increased since the 1960s—see, for example, Díaz-Giménez et al. (2002), Eckstein and Nagypal (2004), Weinberg and Steelman (2005), and Katz, Autor, and Kearney (2007). Furthermore, our article documents periods characterized by a decline in real income for lower income groups.

Figure 1 shows that between 1975 and 2002, only labor income in the top 10 percent of the income distribution (Current Population Survey March Supplement) increased more than the per-worker (total nonfarm employment, Bureau of Economic Analysis) wage and salary income (National Income and Product Account).[2] In particular, while during this period per-worker labor income increased 32 percent, labor income in the 10th percentile of the income distribution increased only 5 percent. In addition, Figure 1 shows

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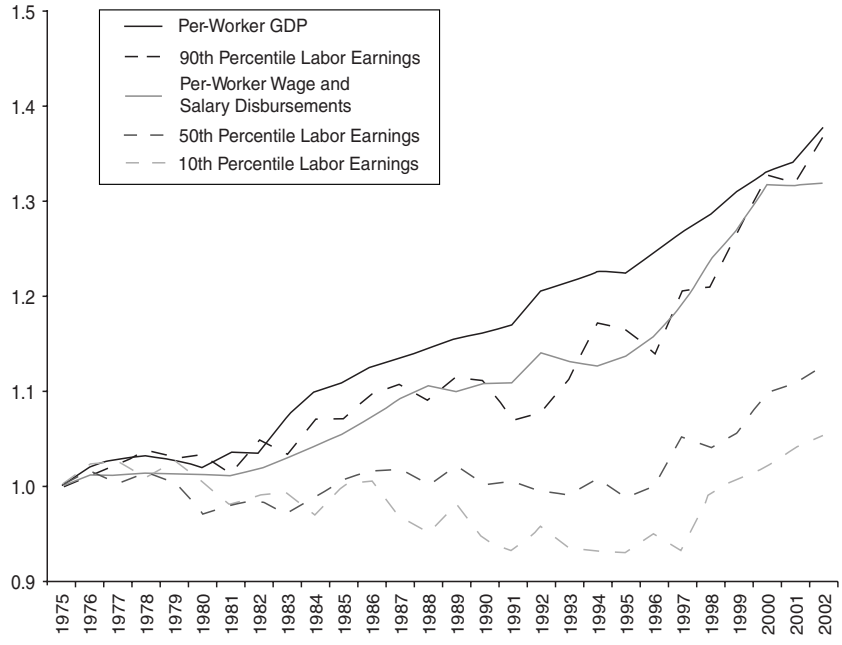
[1] For instance, it has been discussed recently by George W. Bush, Hillary Clinton, and Ben Bernanke—see Ip and McKinnon (2007), Achenbach (2007), and Bernanke (2007).

[2] Note that in Figure 1, per-worker income and percentile incomes are obtained from different sources. As explained later, the Current Population Survey, our source of percentile incomes, cannot be used to compute total income because income in this survey is topcoded. In order to check whether using different sources is problematic, we also calculated per-worker labor income by using the Current Population Survey to obtain the income for the bottom 90 percent of the distribution and by using the labor income shares of the top 10 percent of the distribution, as computed by Kopczuk, Saez, and Song (2007). We found that the growth of this measure of per-worker income is very similar to the growth of the measure reported in Figure 1.

Figure 1 Real Per-Worker GDP and Earnings (1975 = 1, All Workers)



that between 1975 and 1997, labor income in the 10th percentile decreased 7 percent.

We begin by discussing inequality trends for the whole population, and then we document how these trends vary across different subsets of the population. In doing so, we present findings that are consistent with those in previous studies and are robust to different data sets and inequality measures.

First, we show that the evolution of income inequality displays different patterns for the top and the bottom halves of the income distributions. In the bottom half of the distribution, income inequality rose in the 1980s but was stable after that. Income inequality in the top half of the distribution has risen continuously in recent decades.

Second, we show that trends in male and female income inequality are similar over the past few decades. However, the level of inequality is lower among females than among males. We also show that at the same time inequality among both males and females has been increasing, inequality between the two groups has been decreasing. This decrease in the gender gap implies that overall inequality has been lowered because female incomes caught up with male incomes.

Third, we show that income differentials have increased both between and within levels of education. We also show that the increase in between-education-group inequality has been greater for males than for females.

Our analysis focuses on labor income inequality trends, but brief discussions of wage inequality, welfare inequality, and wealth inequality are also presented. In particular, we discuss why the recent increase in income inequality may not be reflected in an increase in welfare inequality.

Finally, we discuss the pre-1960s period. Although data from before 1960 is fairly limited, studies of wage tables, state censuses, tax returns, and industrial surveys are available. We summarize the findings of these studies, which conclude that U.S. income inequality displayed an inverted U-curve pattern. In the 19th century, income inequality rose, but during the interwar period and especially during World War II, there was a marked decrease in inequality, with narrowing overall income differences, as well as shrinking income gaps between males and females, among different races, among blue- and white-collar workers, and among workers with different levels of education (see, for example, Goldin and Katz 1999a).

The rest of this article is organized as follows. Section 1 describes the data sources we use. Section 2 discusses measures of inequality. Section 3 shows that in recent decades income inequality increased and that this increase in inequality is explained mainly by an increase in inequality among individuals with higher incomes. Section 4 discusses income inequality trends and gender. Section 5 focuses on inequality trends and education. Section 6 comments on wage inequality, welfare inequality, and wealth inequality. Section 7 discusses inequality trends before the 1960s. Section 8 concludes.

1. DATA SOURCES

We use four data sources: the Current Population Survey (CPS) March Supplement, the CPS Outgoing Rotation Group (ORG) supplement, Piketty and Saez's (2003) Internal Revenue Service (IRS) top-income data set, and Kopczuk, Saez, and Song's (2007) Social Security data. The Personal Consumption Expenditures price index is used to deflate income figures—deflating with the CPI-U price index does not materially change our results.

The CPS is a monthly survey of households conducted by the Bureau of the Census. Survey questions are always related to employment, but some months also feature supplemental questions. In particular, the CPS March Supplement (available since 1962, recording income from 1961) asks detailed questions about annual labor income, while the CPS ORG (available since 1979, recording 1978 data) asks about hourly wage and hours worked. Though the CPS collects information on interest payments, social security receipts, and other nonwage income, this data is generally considered less reliable than wage data and as such is often not analyzed in studies of income inequality

(see Luxembourg Income Study 2007). The two CPS supplements are commonly used because of their large sample size (between 60,000 and 190,000 observations) and the length of the sample period.

As is standard when inequality measures are constructed using CPS data, we examine only income from the 10th percentile to the 90th percentile. This is because income data tends to be unreliable at the very bottom of the income distribution, and because CPS data sets are topcoded. That is, incomes above a certain level are capped for privacy reasons. For instance, if an individual earns $200,000 in a year where the cap is $99,999, the CPS would list that individual's income as $99,999. This implies that the CPS offers little guidance for examining the top of the income distribution. This may be a significant problem when analyzing income inequality trends because, as we will show later, over the past decades income inequality has risen very rapidly among the top percentiles of the income distribution and, therefore, using topcoded data biases the measured growth in inequality downward.

For CPS March Supplement data, we use a merged 1962–2003 file compiled by Zvi Eckstein and Eva Nagypal.[3] Our analysis of the CPS ORG data is based on the 2007 National Bureau of Economic Research (NBER) Labor Extracts CD-ROM. Our CPS ORG annual labor income figures are computed by multiplying the NBER ORG Labor Extracts weekly earnings figures by 52. In both CPS files, we keep only full-time, full-year workers, where full-year work is defined as 40+ weeks per year. Volunteers, the self-employed, workers younger than 22 years of age, and workers older than 65 years of age are removed from the sample. As in earlier literature, we multiply topcoded incomes by 1.4. This has little effect since we do not examine top incomes using these data sets, though the topcode is binding for 90th percentile incomes for male college graduates in the mid-1980s. Following Katz, Autor, and Kearney (2007), we drop workers with a stated annualized real wage of less than $1/hr. We drop entries with allocated earnings—meaning that missing data has been imputed—from the CPS ORG. Education dummies are constructed so that 0–11 years of school is "High School Dropout," 12 years is "High School Graduate," 13–15 years is "Some College," 16–17 years is "College Graduate," and 18+ years is "Postgraduate."

Kopczuk, Saez, and Song's (2007) Social Security Earnings Data allows us to study the top percentiles of the income distribution. The authors examine data from individual Social Security returns from 1937 to 2005. Since the data is based on Social Security returns, the income reported only includes pre-tax, pre-transfer wages. In this article, we only analyze publicly available

[3] This file can be found at http://faculty.wcas.northwestern.edu/˜een461/QRproject/.

statistics—income shares—of the Social Security data (which, in general, is not publicly available).[4]

Another data set for high-earner incomes is the one studied by Piketty and Saez (2003) in their examination of income tax returns since 1913. The large number of entries at the top of the distribution in this data set allows us, for instance, to compare the evolution of income of the 99.9th percentile and the 99th percentile of the income distribution. In this article, we analyze summary statistics for labor income made available by Emmanuel Saez.[5] As with the Social Security data, the underlying data set is not publicly available. Labor income data is available from 1927 to 2004 and is missing some years during this period. It should be emphasized that tax data is reported at the level of the tax unit, not the individual. Tax units are sometimes individuals, sometimes couples, and sometimes extended families, depending on how a household chooses to file its taxes and whom it chooses to count as dependents. The increasing correlation between spousal income and compositional changes in tax units makes trends in this data not fully comparable with individual income trends. Because income tax returns are only completed for workers above an exemption limit, it is not possible to examine trends in the bottom of the income distribution with this data set.

2. MEASURES OF INEQUALITY

We measure the degree of income inequality using range ratios and income shares. There are many other commonly used measures of inequality, such as Theil's T, variance of log income, Gini coefficients, the coefficient of variation, and the Atkinson Index. Cowell (1995) provides an overview of benefits and failures of each of these measures.

Range ratios, such as the ratio between the 90th percentile income and the 10th percentile income, are often used because they are easy to understand and unambiguous to compute. Furthermore, they allow us to conduct a quick decomposition of changes in inequality. For instance, we will decompose a change in inequality summarized by a variation in the "90-10 ratio" into changes in the bottom half of the income distribution summarized by a variation in the "50-10 ratio" and changes in the top half summarized by a variation in the "90-50 ratio."

As is standard in studies of income inequality, we focus on logged ratios, because the log of a ratio of two values is equal to the difference of the logs of these values, which is approximately equal to the percentage change between these values. For instance, an increase in the log 90-10 ratio from 0.10

[4] We use summary statistics made available by Wojciech Kopczuk at http://www.columbia.edu/˜wk2110/uncovering/.

[5] See http://elsa.berkeley.edu/˜saez/.

to 0.15 implies that the worker in the 90th percentile went from making approximately 10 percent more than the worker in the 10th percentile to making approximately 15 percent more.

Income shares are simply the share of income held by a given group, such as the top 10 percent of the income distribution. This measure is particularly useful for data sets that do not cover the entire income distribution. For instance, income tax data before World War II covers only the top few percents. Nonetheless, national accounts include total income, and trends in top income shares can therefore be calculated.

3. INEQUALITY TRENDS FOR ALL WORKERS

In this section we focus on pre-tax individual labor income. Focusing on individual income instead of household income allows us to present inequality trends that are not directly affected by changes in household composition. Piketty and Saez (2006) argue that changes in the progressivity of taxes and transfers have been small and, therefore, that pre-tax inequality trends are very similar to after-tax inequality trends.

We study the evolution of inequality since the 1960s. Data availability is significantly better for this period than for earlier periods. Comprehensive micro-level data was only available sporadically before 1940, and decennially from 1940 to 1960. Regular surveys beginning in the early 1960s, such as the CPS March Supplement, offer annual income data along with matched information on education levels, occupations, and other variables. This improved data availability allows us to present a detailed examination of inequality trends.

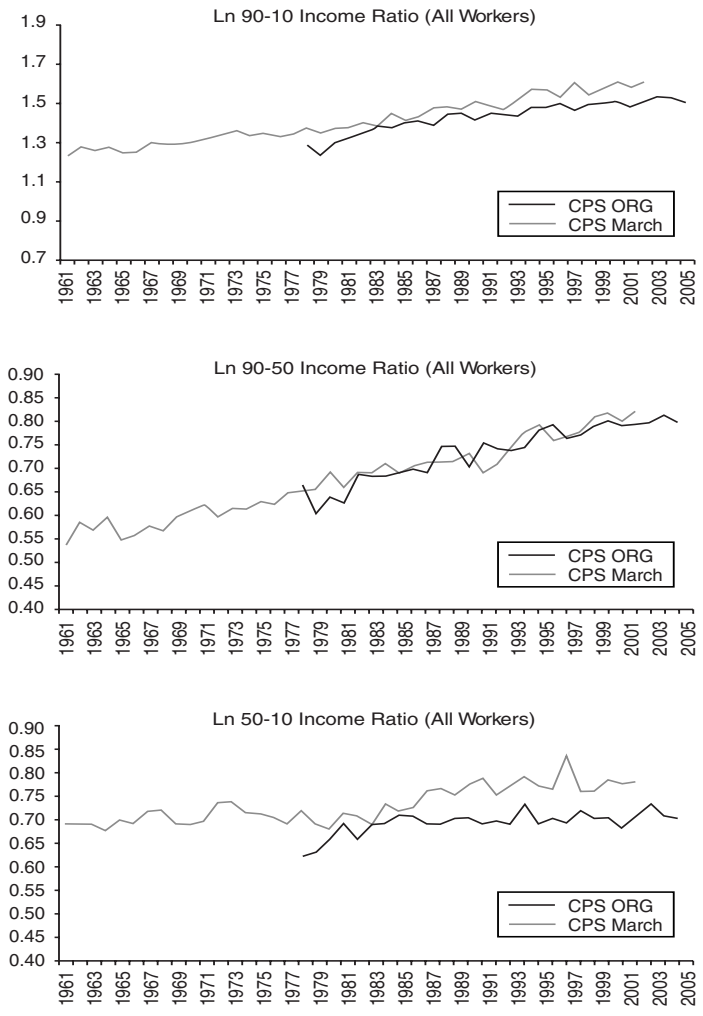
We look at the evolution of the 90-10, 90-50, and 50-10 income ratios. To compute these ratios, we use only the CPS data sets. We do not have exact data for 10th percentile and 50th percentile incomes in the IRS and Social Security data sets used in this article.

Figure 2 presents the evolution of log income ratios. It shows that from 1961 to 2002, the CPS March log 90-10 ratio increased from 1.23 to 1.61. The ratios computed using the CPS ORG data set behave similarly.

Figure 2 also shows that the vast majority of the increase in the log 90-10 ratio is due to an increase in the 90-50 ratio. Since 1961, the log 90-50 ratio grew 0.29, accounting for around 75 percent of the overall increase in 90-10 inequality during this period. The increase in 90-50 inequality also accounts for nearly all of the increase in 90-10 inequality since 1990. This squares with results presented in earlier studies (see, for example, Cutler and Katz 1991 and Katz, Autor, and Kearney 2007). The log 50-10 ratio increased 0.09 during the 1980s but was otherwise constant over the period studied.

The reason for the rise in the 50-10 income ratio during the 1980s has received considerable attention in the income inequality literature. Card and

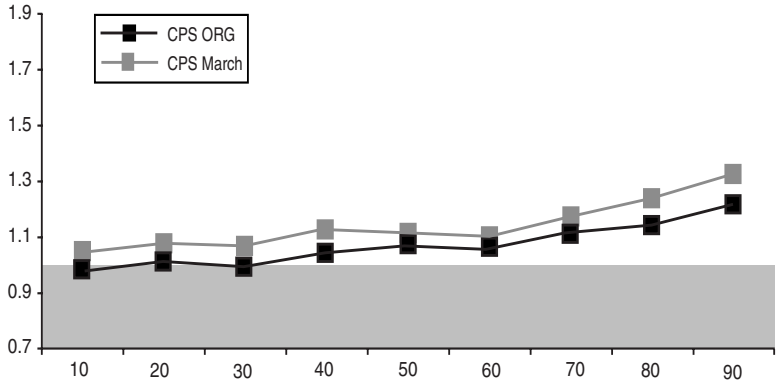
Figure 2 Logged Income Ratios



DiNardo (2002) conclude that the decrease in the real minimum wage is responsible for up to 90 percent of the increase in bottom-half income inequality in the 1980s.[6] Similarly, Lee (1999) uses state-level data on wages and unemployment, and finds that nearly all of the increase in bottom-tail income inequality in the 1980s is a result of changes in the real minimum wage. In

[6] The real minimum wage fell 30 percent between 1980 and 1988. It was roughly stable during the 1990s (Card and DiNardo 2002, Figure 22).

Figure 3 2002–1978 Income Ratios by Percentile for All Workers



contrast, between 1998 and 2006 the real minimum wage fell nearly 20 percent and no significant increase in bottom-half inequality was observed.

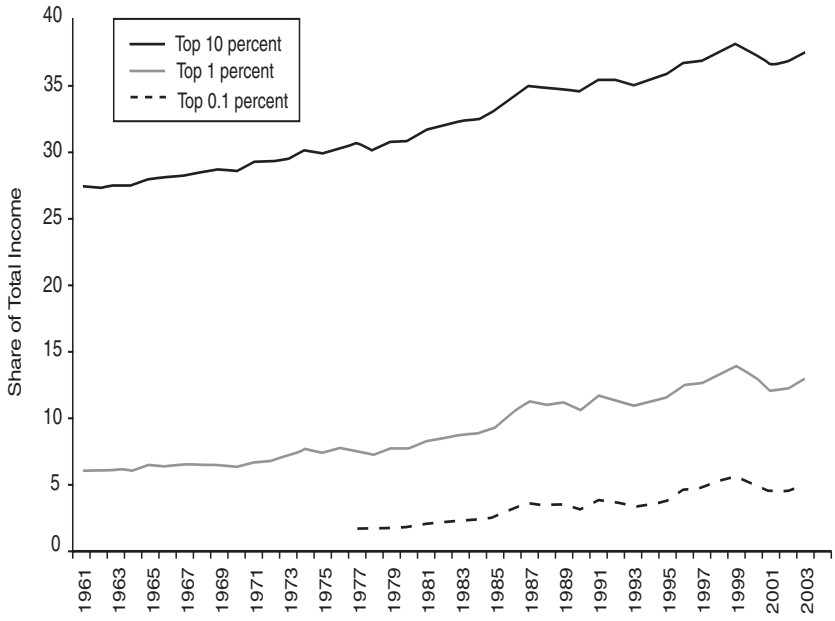
Figure 3 illustrates further that the increase in income inequality during the period under study is concentrated at the top of the income distribution. This figure presents the ratio between the real income in 2002 and the real income in 1978 for each decile of the income distribution. It shows that during this period, differences in income growth rates across percentiles are larger for the higher percentiles.[7] In particular, as in Figure 2, Figure 3 shows that 50-10 inequality increased less than 90-50 inequality during this period.

Since the increase in 90-10 inequality observed in recent decades was concentrated at the top of the 90-10 income distribution, it may also be important to analyze the top 10 percent of the income distribution in order to have a better understanding of the overall trend in inequality. Unfortunately, the CPS data sets are topcoded and therefore do not allow us to conduct such analysis. One way of studying the evolution of income inequality for top incomes is to use Social Security data.

Figure 4 presents the shares of total pre-tax wage earnings of the top 10 percent, the top 1 percent, and the top 0.1 percent of the distribution computed using Social Security data by Kopczuk, Saez, and Song (2007). It shows that between 1961 and 2003, the labor income share of the top 10 percent rose from 27 to 37 percent, and that more than 60 percent of this rise is explained by an

[7] In Figure 3, CPS ORG income growth is lower than CPS March income growth. Although several studies examine differences between CPS ORG data and CPS March data (see, for example, Lemieux 2003, 2006a, and 2006b; Borghans and ter Weel 2004; and Katz, Autor, and Kearney 2007), we are not aware of a comprehensive explanation of the differences between the income growth rates in the two data sets.

Figure 4 Income Share of Top Labor Incomes (Social Security)



increase of the share of the top 1 percent of the income distribution. Kopczuk's data also includes the income share of the top 0.1 percent since 1977. More than 60 percent of the increase of the share of the top percentile between 1977 and 2003 is explained by a rise in the share of the top 0.1 percent. The top 0.1 percent of individuals earn between 2 and 5 percent of the national labor income in our sample.

Though there is much less robust data on working conditions other than labor income, evidence in previous studies suggests that including nonwage income and compensation would increase the growth in inequality observed in recent decades. Pierce (2001) compiles data on fringe compensation from census microdata and finds that including benefits such as leave and health insurance increases the growth of inequality. Mishel, Bernstein, and Allegretto (2006) provide evidence of declining medical insurance and pensions for low-wage workers. Hamermesh (1999) finds that workplace injury rates and the number of nighttime or weekend shifts have fallen more rapidly for high-wage workers than for low-wage workers. These findings suggest that inequality measures based on labor income alone should be taken as a lower bound of the increase in inequality.

4. INEQUALITY TRENDS AND GENDER

In this section we present inequality trends for males and females separately. We will show that trends in male and female income inequality over the past few decades are similar. While in 1961 females represented 34 percent of the labor force, in 2007 they represented 46 percent (Bureau of Labor Statistics).

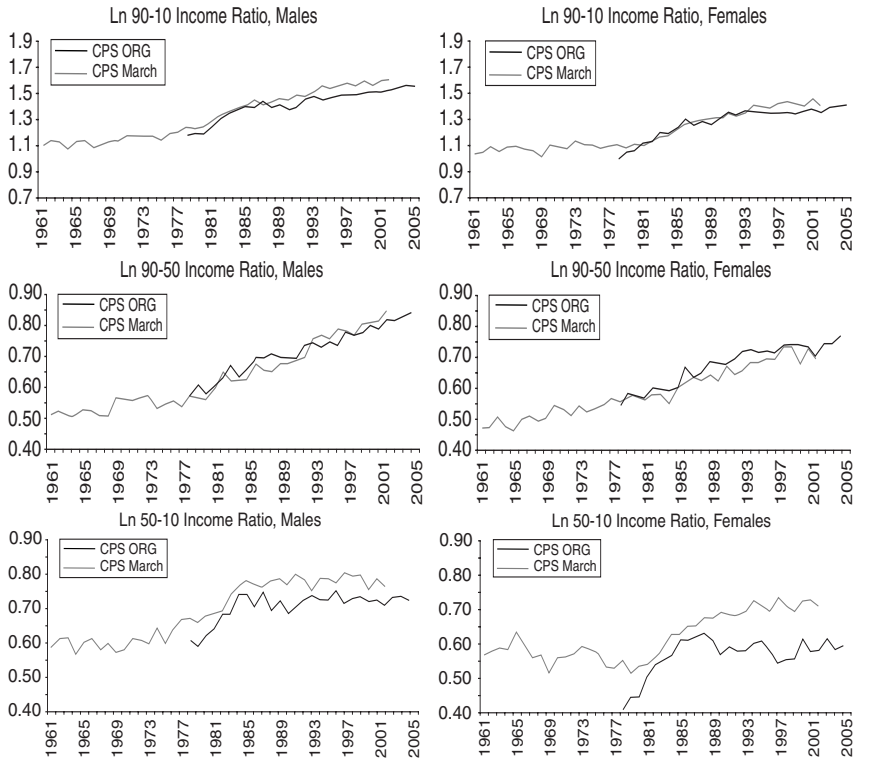
Figure 5 presents the evolution of income ratios for males only and females only. It shows that 90-10 inequality for males has been growing since the late 1960s and that the rate of growth has been higher since the second half of the 1970s. It also shows that 90-10 inequality grew more among males than in the entire population. As in the entire population, the inequality trend for males only is explained by a continuous increase in the 90-50 ratio (which accelerated in the second half of the 1970s) and a rise in the 50-10 ratio concentrated in the 1980s. This is consistent with results presented in previous studies (see, for instance, Katz, Autor, and Kearney 2007).

Figure 5 also shows that the level of inequality is lower among females than among males. The timing of the increase in female inequality is similar to that among males. As in the male population, the increase in inequality among females is mainly explained by an increase in 90-50 inequality and a rise in 50-10 inequality concentrated in the 1980s.

Figure 6 presents the ratios between real incomes in 2002 and 1978 for different percentiles for both males and females (Figure 3 presents the same ratios in the whole population). It shows that the bottom 50 percent of the male income distribution saw no more than a 5 percent increase in real income from 1978 to 2002. The picture is different for females, who have seen rising real wages between 1978 and 2002 across all deciles. Thus, Figure 6 shows that females are driving the income growth at the bottom of the income distribution presented in Figure 3.

While inequality among both males and females has been increasing, inequality between the two groups has been decreasing. Figure 7 presents the evolution of the ratio of female income to male income at the 10th, 50th, and 90th percentiles in the CPS March Supplement data set—the behavior of these ratios in the CPS ORG data set is similar. It shows that, in general, the gender gap is larger at higher levels of income distribution. This is consistent with the fact that inequality is higher among males, as seen in Figure 5. Figure 7 also shows that the gender gap closed substantially over time. The relative increase in female incomes started in the 1970s for the 10th percentile and in the 1980s for the 50th and 90th percentiles. This increase stopped in the mid-1990s. The change in the gender gap implies that overall inequality has been lowered as female incomes caught up with male incomes.

Figure 5 Logged Income Ratios for Males and Females

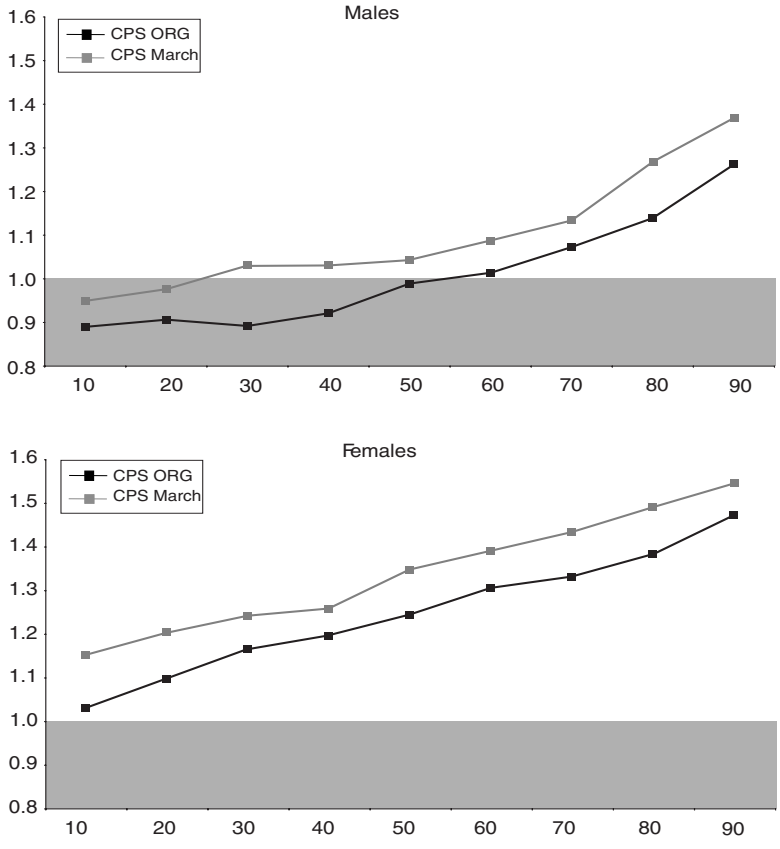


5. INEQUALITY TRENDS AND EDUCATION

In this section we show that inequality has increased both *between* education groups and *within* education groups. That is, real labor income increased more for people with more years of education (an increase in between-group inequality) and the dispersion in labor incomes increased within education groups (within-group inequality increased).

Table 1 presents the evolution of CPS March Supplement male and female labor income for different levels of education. Inequality trends are similar in the CPS ORG data set. This table shows a substantial increase in within-group inequality. For example, for males with a college degree, the 10th percentile income increased 11 percent and the 90th percentile income increased 71 percent between 1963 and 2002. The importance of within-group inequality illustrated in Table 1 is consistent with results in previous studies that show that observable characteristics—mainly education and experience—can only

Figure 6 2002–1978 Income Ratios by Percentile

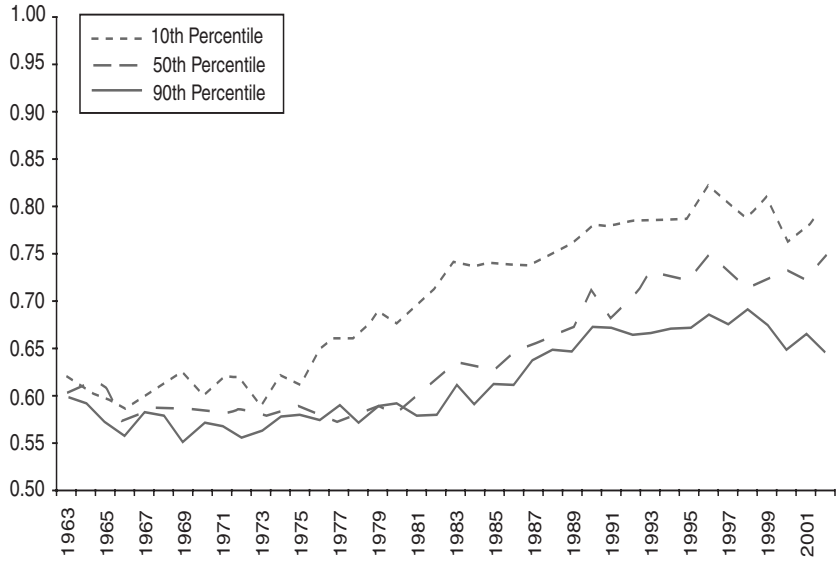


explain a small fraction of observed inequality (see, for example, the discussion in Lemieux 2006b).

An increase in between-group inequality is also present in Table 1. For example, between 1963 and 2002, the median male income increased 78 percent for postgraduates, 41 percent for college graduates, 17 percent for some college, and 11 percent for high school graduates; it decreased 10 percent for high school dropouts. Table 1 also shows that the increase in between-group inequality has been larger for males than for females.

One can also see in Table 1 that there are periods characterized by declines in real income for certain groups. The largest decline is a 27 percent decrease in the median income of high school dropouts between 1972 and 1992. Note that since the 1960s, the percentage of the labor force without a high school degree has halved for both males and females, falling to around 10 percent for

Figure 7 Female-Male Income Ratio



each gender by 2006. The declines in real income seem to have stopped in the 1990s.

A common explanation for the increase in the education premium is skill-biased technological change (SBTC). The SBTC hypothesis suggests that the introduction of computers increased returns to skills, education, and experience, and therefore resulted in a rise in inequality (see, for example, Juhn, Murphy, and Pierce 1993). However, more recent studies challenge this hypothesis by noting that the return to skills grew only in the 1980s and SBTC should have resulted in an increase in the demand for skills in both the 1980s and the 1990s since technological improvements continued into the 1990s (see, for example, Card and DiNardo 2002).

6. WAGE INEQUALITY, WELFARE INEQUALITY, AND WEALTH INEQUALITY

So far, our analysis has focused on annual income inequality trends. In this section we present brief discussions of hourly wage inequality, welfare inequality, and wealth inequality.

Table 1 Real Labor Income (1963=1)

	1972	1982	1992	2002
Postgraduate				
Males 90th Percentile	1.43	1.65	TC	TC
Males 50th Percentile	1.31	1.29	1.44	1.78
Males 10th Percentile	1.40	1.38	1.50	1.64
Females 90th Percentile	1.19	1.25	1.49	1.98
Females 50th Percentile	1.22	1.14	1.33	1.55
Females 10th Percentile	1.22	1.25	1.51	1.74
College Graduate				
Males 90th Percentile	1.34	1.28	1.34	1.71
Males 50th Percentile	1.27	1.15	1.23	1.41
Males 10th Percentile	1.13	1.02	0.95	1.11
Females 90th Percentile	1.14	1.17	1.47	1.86
Females 50th Percentile	1.18	1.15	1.31	1.50
Females 10th Percentile	1.11	1.00	1.09	1.20
Some College				
Males 90th Percentile	1.28	1.20	1.22	1.41
Males 50th Percentile	1.18	1.12	1.06	1.17
Males 10th Percentile	1.15	0.97	0.91	1.04
Females 90th Percentile	1.21	1.32	1.52	1.72
Females 50th Percentile	1.19	1.20	1.33	1.45
Females 10th Percentile	1.15	1.14	1.14	1.23
High School Graduate				
Males 90th Percentile	1.24	1.23	1.20	1.31
Males 50th Percentile	1.25	1.17	1.06	1.11
Males 10th Percentile	1.16	0.95	0.83	0.89
Females 90th Percentile	1.27	1.34	1.45	1.62
Females 50th Percentile	1.18	1.16	1.21	1.33
Females 10th Percentile	1.21	1.18	1.13	1.21
High School Dropout				
Males 90th Percentile	1.31	1.24	1.11	1.14
Males 50th Percentile	1.24	1.07	0.91	0.90
Males 10th Percentile	1.28	1.07	0.88	0.98
Females 90th Percentile	1.19	1.14	1.19	1.25
Females 50th Percentile	1.20	1.15	1.07	1.23
Females 10th Percentile	1.31	1.25	1.15	1.24

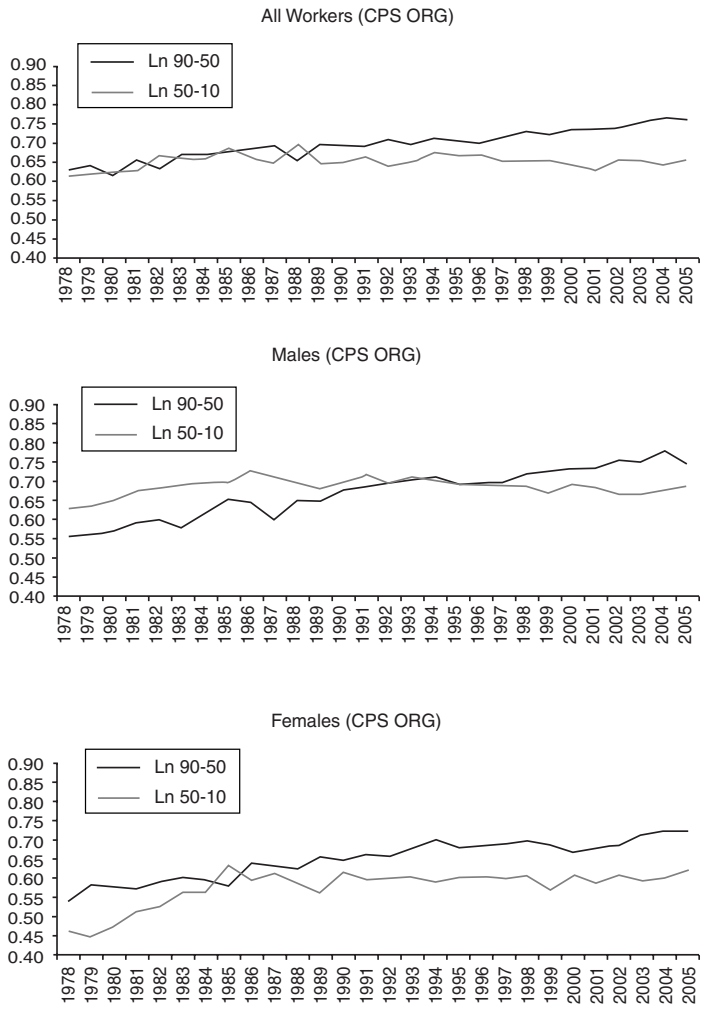
Notes: TC indicates that data was topcoded.

Wage Inequality

Wage inequality trends may be different from the annual income inequality trends discussed in previous sections because of different trends in hours worked across the income distribution.

We construct wage inequality trends using CPS ORG data—as discussed by Lemieux (2006b), CPS March Supplement data only includes intervals of hours worked (e.g., 20–25 hours). The CPS ORG asks hourly workers for

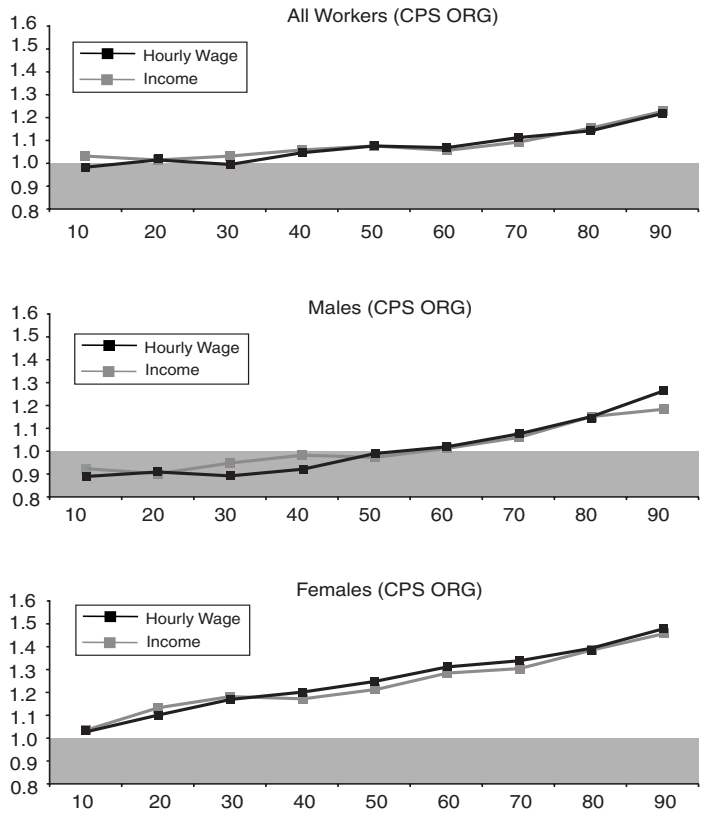
Figure 8 Ln 90-50 and Ln 50-10 Hourly Wage Ratios



their hourly earnings and it asks salaried workers for usual weekly earnings and usual weekly hours worked.

Figure 8 presents logged 90-50 and logged 50-10 wage ratios for all workers, males only, and females only. The figure shows that bottom-tail inequality rose among all groups around the early 1980s, and it increased more among females. Like 90-50 income inequality, 90-50 wage inequality rose continuously from 1978 to 2005. The comparison of Figure 8 with Figures 2 and 5 shows that wage inequality trends are similar to income inequality trends (note that the scale for the horizontal axis in Figure 8 is different than the

Figure 9 2005–1978 Ratios by Percentile



scales in Figures 2 and 5 and, thus, it may appear that inequality increases less in Figure 8 even though this is not the case).

Figure 9 presents the ratio between the real wage in 2005 and the real wage in 1978 for each decile and for all workers, males only, and females only. It also presents the same ratios for real income. The figure shows that the distribution of real wage growth is similar to the distribution of real income growth.

Welfare Inequality

Changes in welfare inequality should not be naïvely inferred from trends in income inequality. Welfare measures depend on the consumption of goods and leisure. It could very well be that while income inequality has increased,

Table 2 Mean Leisure Hours per Week for Males (Aguiar and Hurst 2007)

	Years of Schooling			
Year/Category	**0–11**	**12**	**13–15**	**16+**
1965	104.12	101.66	99.21	101.64
1985	106.94	107.53	105.03	107.02
2003	116.34	108.94	105.42	101.44
Change 1965–2003	12.22	7.28	6.21	-0.20
Change 1985–2003	9.40	1.41	0.39	-5.58

consumption inequality has not increased, or that individuals who benefited from higher consumption growth also experienced a smaller increase in leisure.

Regular surveys on individual consumption have existed since the early 1980s. Krueger and Perri (2006) find both that the level of consumption inequality is lower than the level of income inequality and that consumption inequality increased less than income inequality. They find that, between 1980 and 2003, household income (after-tax labor earnings plus transfers) inequality, measured as the variance of the logs of income in the Panel Study of Income Dynamics (PSID) data set, increased 21 percent.[8] They also find that during the same period, depending on the treatment of durable goods, consumption inequality increased between 2 and 10 percent. Blundell, Pistaferi, and Preston (2006) argue that the difference between the rise in income inequality and the rise in consumption inequality is explained by an increase in the variability of transitory income shocks. They also explain that it is more problematic for low wealth households to insure against these shocks. Attanasio, Battistin, and Ichimura (2004) find a larger increase in consumption inequality than Kreuger and Perri (2006) but nonetheless argue that consumption inequality has increased less than income inequality. These findings indicate that welfare inequality may have increased less than income inequality.

Aguiar and Hurst (2007) examine leisure inequality by aggregating irregular time-use surveys going back to 1965. Leisure is defined as time not spent at work or on household production. They find that the income-poor have seen the largest increase in leisure time. Table 2 shows that, since 1965, leisure has increased the most for those with less education.[9] Since people

[8] Krueger and Perri (2003) find that trends in household income are very similar in equivalent samples of the CPS ORG, the PSID, and the Consumer Expenditure Survey.

[9] This table reports Aguiar and Hurst's (2007) "median" measure of leisure, which includes time sleeping, eating, and activities "pursued solely for direct enjoyment." Note that this definition of leisure does not discriminate between individuals who voluntarily choose not to work and those who are involuntarily unemployed.

with more education have, on average, higher incomes, Aguiar and Hurst's (2007) findings imply relatively larger gains in leisure at the bottom of the income distribution.[10] Thus, these findings also imply that welfare inequality may have increased less than income inequality.

Wealth Inequality

Wealth data is not as readily available as data on income, but surveys such as the Federal Reserve's Survey of Consumer Finances and estate tax returns filings are analyzed in studies of wealth inequality. It is well known that wealth is distributed much more unequally than income. For instance, Casteñada, Díaz-Giménez, and Ríos-Rull (2003) find that in the United States, while the top 1 percent of the wealth distribution holds 26 to 30 percent of the wealth, the income share of the top 1 percent of the income distribution is only 10 to 15 percent of total income.

Trends in income inequality may influence trends in wealth inequality through savings. However, studies have shown that the increase in income inequality observed in recent decades has not been reflected in an increase in wealth inequality. For example, Kopczuk and Saez (2004) find that there has been very little change in the holdings of the top of the wealth distribution since 1970 and that the only major change in the wealth distribution during the 20th century is a massive reduction in the wealth share of the top of the distribution between 1929 and 1945.

7. INEQUALITY TRENDS BEFORE THE 1960S

In this section, we summarize findings of studies of the evolution of income inequality in the United States before the 1960s. There are no large-scale regular population surveys that include individual labor income data during this period. Before 1940, even the decennial U.S. Census did not ask about income (see Williamson and Lindert 1980 and Margo 1999 for discussions of these data limitations). Thus, income inequality before 1940 can only be roughly estimated from sources such as irregular local surveys, state censuses, and tax returns.

Kuznets (1955) famously discusses the basic trends in American income inequality for this period: rising inequality before World War I and falling inequality since the 1920s. Later studies confirmed these trends.

[10] The increase in leisure inequality documented by Aguiar and Hurst (2007) is not inconsistent with the trends in income and wage inequality being similar in Figures 2, 5, 8, and 9. These figures are constructed by considering only full-time workers, and Aguiar and Hurst (2007) construct leisure trends by considering both full-time and part-time workers.

Table 3 Standard Deviation of Manufacturing Wages (Margo 1999, Censuses of Manufacturing)

	1860	1880	Change
Log Wage	0.23	0.36	0.13
Log Wage with State Dummies	0.23	0.32	0.09

There is evidence of increasing wage inequality before the Civil War. For instance, Margo (2000) identifies a compilation of wages paid at government forts for hired labor (clerks, manual laborers, cooks, etc.) from 1820 to 1860. He finds that in this period, wages of clerks rose over a half percentage point more per year than wages of manual laborers. This trend suggests that wage inequality rose—recall that clerks were relatively educated workers in that period. Related wage ratios for skilled artisans and other broad occupation classes show similar patterns. Margo (2000) suggests that this increase in inequality may have been driven in part by a change in the education premium.

Studies also find that income inequality continued to increase, and the premium to skilled labor continued to rise until the end of the 19th century. For example, Table 3 presents the increase in the dispersion of manufacturing wages in the United States from 1860 to 1880 documented by Margo (1999). This increase shows that not only did wage inequality grow across industries, but it also grew within some industries—manufacturing, in this case. Margo (1999) explains that this increase is partially driven by changes in wages across regions after the Civil War. Barro and Sala-i-Martin (1992) report similar trends in their study of the convergence in incomes among states during the postbellum period, documenting a large drop in manufacturing wages in the South. Williamson (2006) provides further evidence of these trends, which he argues are explained in part by the increase in the supply of unskilled labor resulting from high levels of immigration from Europe.

It has also been shown that wage differentials between blue-collar and white-collar workers as well as inter-industry wage differentials shrank around World War I and were stable until the end of the Great Depression. Goldin and Katz (1999a) examine wage series for manufacturing workers, university professors, engineers, and bookkeepers. They find a decrease in the wage premium of the high-education professions over manufacturing wages. Table 4 presents examples of this decrease. The same data show a 20 to 30 percent decrease in the 90-10 wage ratio among manufacturing workers in a number of different industries from 1890 to 1940. Most of this change is concentrated in the bottom half of the distribution. Further, a 1915 Iowa Census was conducted containing information on both income and education, which can then be compared to 1940 United States census data restricted to include only entries in Iowa. Goldin and Katz (1999b) use this data to estimate the return in wages

Table 4 Ratio of Wages of Educated Workers over the Average Manufacturing Wage (Goldin and Katz 1999a)

	Starting Engineers	Male Clerical Workers
1895	—	1.691
1909	1.202	1.652
1914	1.149	1.696
1919	1.005	1.202
1929	1.037	1.128
1939	1.008	1.150
1949	1.012	1.076
1959	—	1.019

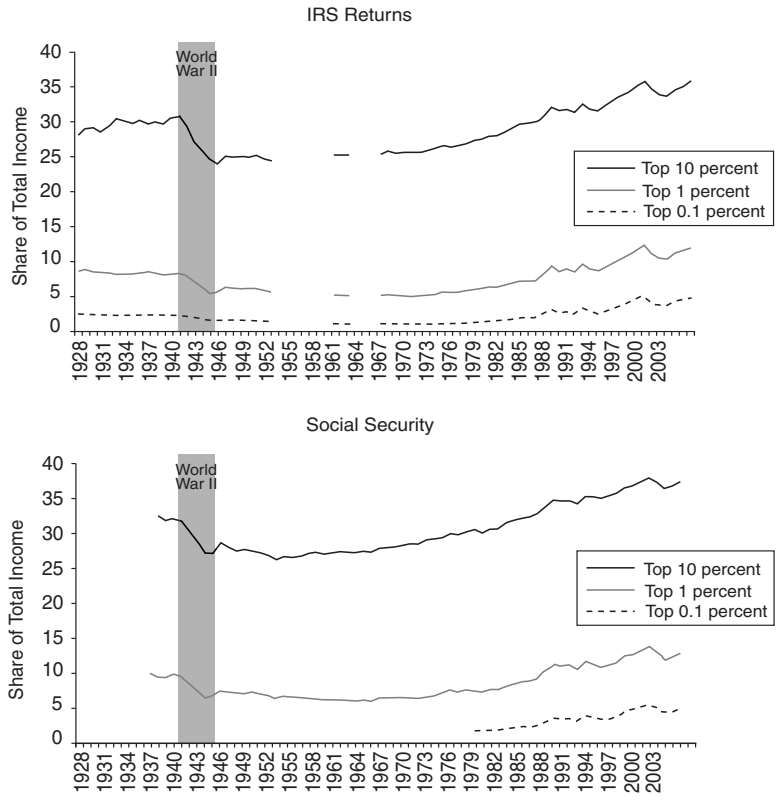
to a year of high school education and find a decrease in this return from 13 percent in 1915 to around 9.5 percent in 1940.

The period around World War II is characterized by decreases in income inequality, an event often called "The Great Compression." Goldin and Margo (1992) explain that this compression is accounted for in part by the National War Labor Board's control of wages during the war. They study public use microdata samples from the 1940 and 1950 censuses and find a large drop in income inequality during this decade, with a low level of income inequality persisting through the 1960s. The return to a year of education computed by Goldin and Katz (1999b) fell two to four percentage points between 1940 and 1950. Piketty and Saez's (2003) data on annual labor income reported in tax returns to the IRS, and Kopczuk, Saez, and Song's (2007) Social Security data show a large drop of the relative income of the top earners around World War II. Figure 10 presents the behavior of the income shares in these two data sets. Although IRS data uses tax units income rather than individual income, the behavior of the two series is quite similar.

8. CONCLUSIONS

This article documents an increase in income inequality in the United States in recent decades. Furthermore, the article documents periods characterized by a decline in real income for lower income groups. We show that this increase in inequality is explained mainly by an increase in inequality at the top of the income distribution. Significant increases in inequality within lower incomes are only observed during the 1980s. We also explain that welfare inequality may have increased less than income inequality. Finally, we show that the recent period of increasing inequality followed a period of decreasing inequality since World War I, which in turn followed a period of increasing inequality in the 19th century.

Figure 10 Income Share of Top Labor Incomes



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