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# How Changes in Employment, Earnings, and Public Transfers Make the First Two Years of the Great Recession (2007-2009) Different from Previous Recessions & Why It Matters for Longer Term Trends

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## **Report Summary**

What distinguishes the first two years of the Great Recession from earlier recessions, especially the first two years of the double-dip recession of 1979-1983, is employment losses for household heads and their spouses – rather than changes in their wage earnings – are driving declines in median income and increases in income inequality. Furthermore, increases in unemployment insurance payments and other public transfers have played a much greater role than in the past. Future trends will depend on the economy's ability to generate higher employment rates as Congress scales back the temporary public-transfer programs which limited the impact of the Great Recession in its first two years.

## *How Changes in Employment, Earnings, and Public Transfers Make the First Two Years of the Great Recession (2007-2009) Different from Previous Recessions & Why It Matters for Longer Term Trends*

What accounts for the decline in median income and rise in income inequality during the first two years of the Great Recession (2007-2009), and how do these compare to previous economic downturns? Data on median income or income inequality trends will be most useful to policymakers if the underlying employment, demographic and source-specific income trends that account for them can be identified. For example, if the earnings of men and women who are still employed are stable and median income declines are solely accounted for by reduced employment, then the policy prescriptions may differ from a case where falling household incomes are primarily accounted for by the falling wage earnings of the employed. Similarly, while the indirect effects of public-transfer programs are difficult to measure, it is important for policy makers to understand the extent to which the direct effects of these short-term programs mitigated declines in private sources of income due to the recession.

This report uses a shift-share analysis to consider how such factors account for changes in median income and income inequality over the first two years of the Great Recession and other recessions since 1979. We show that falling real earnings of the employed have played a relatively minor role in the decline in median income and the rise in income inequality, especially when compared to earlier recessions. Instead, employment declines are primarily driving these outcomes, which would have been much worse, except for the major role that public transfers have played in offsetting these outcomes relative to previous recessions. As a result, how median income and income inequality will change over the remainder of the current business cycle and beyond will greatly depend on the economy's ability to generate higher employment rates as Congress scales back these temporary public-transfer programs.

## Data

The analyses in this report use data from the public use March Current Population Survey (1980-2010) supplemented with cell-means for top-coded incomes from Larrimore et al. (2008).<sup>1</sup> The public use CPS data is one of the most commonly used data sets for evaluating U.S. income and income inequality trends (see e.g. Gottschalk and Danziger 2005; Daly and Valetta 2006).

This report focuses on the pre-tax, size-adjusted household income of persons, including labor and non-labor earnings as well as cash government transfers. Size-adjusted household income accounts for economies of scale in household consumption by dividing income by the square root of household size.<sup>2</sup> This income measure is commonly used in U.S. and cross-national

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<sup>1</sup> Larrimore et al. (2008) demonstrates that the public use CPS data supplemented with cell-means for top-coded incomes produces results for income and income inequality trends that closely match those found in the internal CPS data used by the Census Bureau to produce their official income statistics (DeNavas-Walt, Proctor, and Smith 2010).

<sup>2</sup> This measure differs from the equivalence scale used by the Census Bureau in their annual report on income and poverty levels (DeNavas-Walt, Proctor, and Smith 2010) and the new supplemental poverty measures (Interagency

studies of inequality (see e.g. Gottschalk and Smeeding 1997; Atkinson and Brandolini 2001; Burkhauser et al. Forthcoming, a) as well as by the Organisation for Economic Co-operation and Development (OECD) in its official measures of income inequality and poverty (d’Ercole and Förster, forthcoming). It assumes that income is shared equally among all household members, so each individual in the household receives the same amount for their personal consumption. All income is adjusted for inflation using the Consumer Price Index Research Series (CPI-U-RS) to capture income trends in real dollar terms.<sup>3</sup>

## Long-term trends in median income and income inequality

Figure 1 shows the trends in the median size-adjusted household income of persons between 1979 and 2009. The left-axis denotes the median income in constant dollars and the right-axis normalizes 1979 to 1 in order to denote its percentage change since 1979.<sup>4</sup> Peaks of each business cycle (1979, 1989, 2000, and 2007) are denoted by solid vertical lines, while troughs of each business cycle (1982, 1992, and 2004) are denoted by dashed vertical lines.<sup>5,6</sup>

While median income is sensitive to business cycle variations, it traditionally has risen over time when measured at equivalent points in the business cycle. This was true in both the 1979-1989 business cycle, when it rose by about 9 percent, and the 1989-2000 business cycle, when it rose by about 13 percent. However, real median size-adjusted household income of persons failed to rise over the 2000-2007 business cycle, remaining constant at about \$35,500 or \$71,000 for a household of four. This was the first business cycle since the 1970s where it did not increase.<sup>7</sup>

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Technical Working Group 2010). Unlike these measures, it does not differentiate in its treatment of children and adults when adjusting for household size. However, dividing by the square root of household size closely matches the adjustments for household size implied by the Census Bureau poverty thresholds (Ruggles 1990).

<sup>3</sup> The CPI-U series reported by the Bureau of Labor Statistics has undergone methodological improvements which have not been incorporated retroactively. The CPI-U-RS accounts for these changes to provide a more accurate historical series of inflation which is typically below that found using the CPI-U (Stewart and Reed 1999).

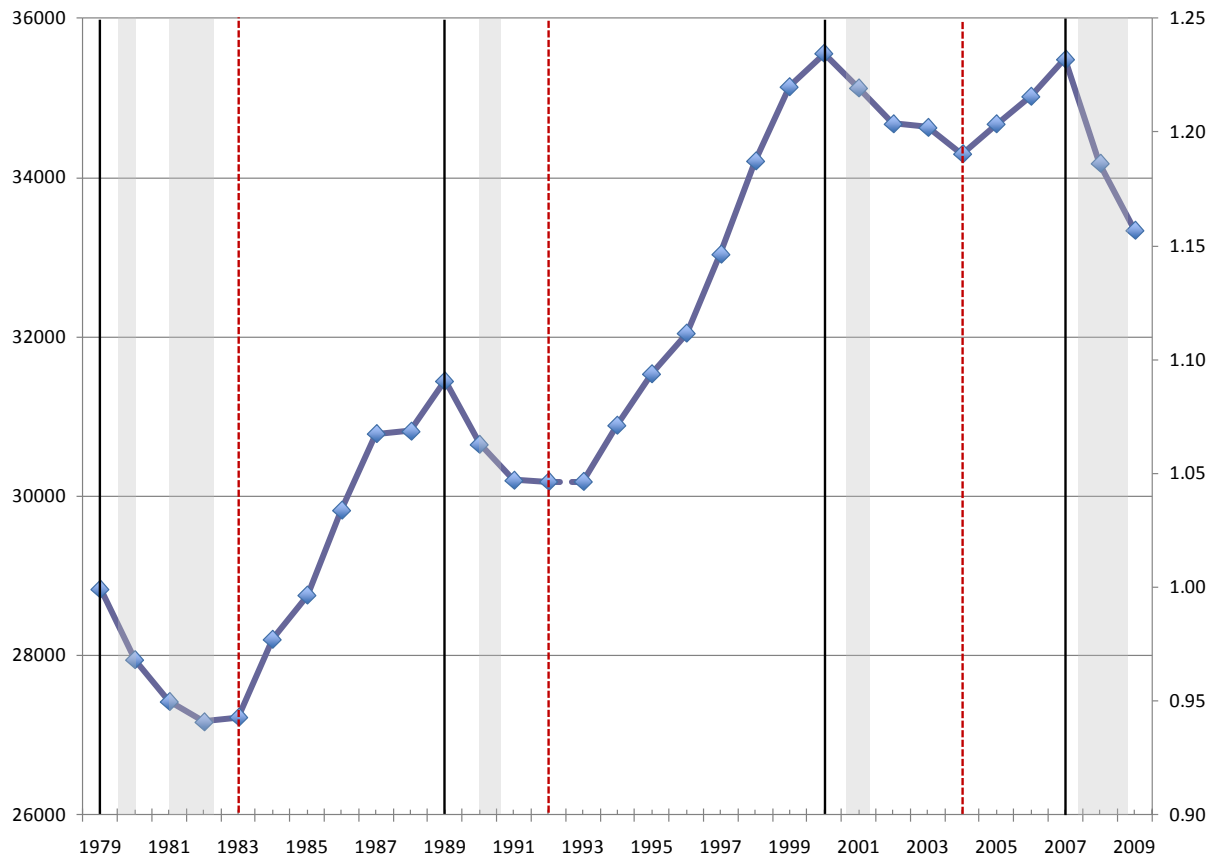
<sup>4</sup> A common refinement on size-adjusted household income of persons is to calculate it for a four-person household. Since the size-adjustment is the square-root of the household size, these values can be obtained by doubling the size-adjusted household income for a single person presented here.

<sup>5</sup> Peak and trough years are defined based on peaks and troughs in median income rather than strict NBER macroeconomic business cycles, which are denoted by gray vertical bars in Figures 1 and 2. Note that because median income declined continuously from 1979 to 1983, we consider this double-dip recession as a single continuous recession in our analysis.

<sup>6</sup> Due to the break in the CPS data between 1992 and 1993 around the trough of that recession, the trough was assumed to occur in 1992 before the break in the data series. (See Ryscavage 1995 and Weinberg 2006 for discussions of issues related to this data break).

<sup>7</sup> Burkhauser, Larrimore, and Simon (2010) demonstrate that this observation is sensitive to the measurement of income. If income is measured as post-tax income including non-cash fringe benefits rather than pre-tax income excluding non-cash benefits, then there was small income growth from 2000-2007. Nevertheless, income growth was slower over this business cycle’s peak years than the previous two business cycles.

**Figure 1: Trend in median size-adjusted household income of persons (1979-2009)**



Notes: (1) Left-axis is 2009 dollars, right-axis normalizes 1979 income to 1.

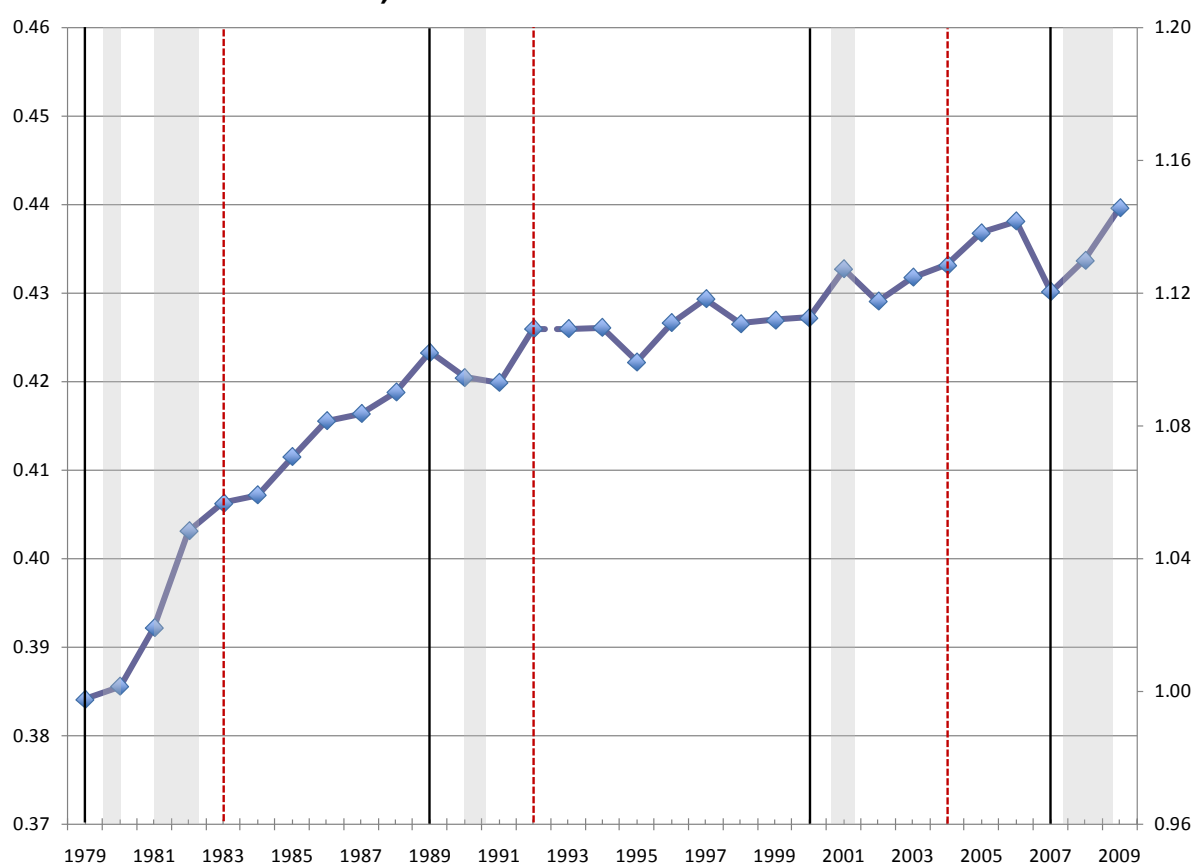
(2) Peak years of business cycle are denoted with black vertical lines and trough years are denoted with red dashed vertical lines. The starting year of the period (1979) also represents a peak business cycle year. Official NBER recession periods are denoted by vertical gray bars. Due to a change in CPS survey collection methods, income trends are not directly comparable between 1992 and 1993. Because we assume that the change in the income series in this year is due solely to collection method differences, in Figure 1 and Figure 2, we assume there is no change in the income series occurred in this year. This assumption matches that described in Larrimore (2010), which is similar to that used by Atkinson, Piketty, and Saez (Forthcoming) and Burkhauser et al. (Forthcoming, b).

Source: Authors' calculations using Public-Use March CPS data (1980-2010).

The picture is similar when comparing troughs of business cycles. Unlike the previous business cycles, measured trough to trough, median income fell between 2004 and 2009 and is likely to fall again in 2010. In this case, however, the 2.8 percent drop between 2004 and 2009 is already much larger than the 0.2 percent drop between peak years 2000 and 2007.

Figure 2 uses a Gini coefficient to capture income inequality trends since 1979, again displaying the actual Gini values on the left-axis and normalizing 1979 to 1 on the right-axis.<sup>8</sup> Income inequality rose rapidly, by about 10 percent, between the business cycle peak years of 1979 and 1989. While it continued to increase over the business cycles of 1989-2000 and 2000-2007, these increases slowed substantially to less than 1 percent in each business cycle.

**Figure 2: Trend in the distribution of size-adjusted household income of persons (Gini Coefficient 1979-2009)**



Notes: (1) Left-axis is Gini coefficients, right-axis normalizes 1979 Gini coefficient to 1. (2) See note 2 for Figure 1.

Source: Authors' calculations using Public Use March CPS Data (1980-2010).

<sup>8</sup> The Gini is a commonly used measure of inequality that, unlike P90/P10 ratios or top income shares, satisfies the desirable properties of an inequality index described by Jenkins and Van Kerm (2009). A Gini coefficient of zero indicates that all individuals have identical incomes and a value of one indicates that a single individual controls all income in the society.

These results may appear at odds with many popular reports of income-inequality trends based on the work of Piketty and Saez (2003). However, as demonstrated by Burkhauser et al. (Forthcoming, b), the differences occur for three reasons. Following the traditional income inequality literature (see Salverda, Nolan, and Smeeding 2009 for a review of this literature), we include non-taxable income; we account for sharing of income among all household members; and we measure inequality using the broad-based Gini coefficient rather than focusing only on the share of taxable income going to the top part of the distribution of tax units.

## Median income and income inequality during economic declines

Researchers commonly compare peaks to peaks or troughs to troughs of business cycles as we did above, because this presents income trends devoid of business-cycle variations.<sup>9</sup> Such an approach abstracts from the individual effects of the periods of economic decline and economic growth within each business cycle.

But it is also possible to focus on the relative severity of economic downturns across business cycles by examining similar periods after each business-cycle peak. This can be done by either comparing a fixed length of time after each peak year, or by comparing peak years to the subsequent trough year to capture the entire period of decline regardless of its length.

Since the final trough year of the Great Recession may not occur until 2010 or 2011, for which CPS data are not yet available, we will examine its severity and the factors that account for it by comparing the two-year period following the 2007 peak to the two-year periods following each of the previous three business-cycle peaks. However, we will also examine how the first two years of business cycles compare to the entire peak/trough periods of the previous three recessions.

Table 1 provides the percentage changes in median household income and income inequality during the first two years of each recession since 1979. The severity of the most recent recession is evident as median income fell by more than six percentage points in real terms from 2007 through 2009. This is more than one percentage point greater than 1979-1981, the previous high point in two-year median-income declines since yearly CPS individual level data became available to researchers in 1967. It is more than double the 2.46 percentage point decline in median income that followed the peak of 2000.

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<sup>9</sup> Choosing uniform comparison years should be of particular concern to researchers doing economic research using decennial census data, because the 1980, 1990, and 2000 Censuses all occurred at or near peak years of business cycles while the 2010 Census occurred near a business cycle trough.



**Table 1: Percentage change in the median size-adjusted household income and income inequality of persons during the first two years of economic downturns (1979-2009)**

	Percentage change	
	Median Income	Gini Coefficient
1979-1981	-4.89	2.09
1989-1991	-3.96	-0.81
2000-2002	-2.46	0.43
2007-2009	-6.05	2.20

Source: Authors' calculations using Public Use March CPS Data (1980-2010).

The effects of the recession on income inequality have been equally pronounced. Income inequality was relatively stagnant from the early 1990s through 2007; the 2.20 percent growth in inequality from 2007 through 2009 by far exceeded inequality growth seen during either the 2000-2002 or 1989-1991 downturn. It was somewhat higher than the 2.09 percent inequality growth during the first two years (1979-1981) of the 1980s recession, although this difference may not be statistically significant. However, as seen in Figure 2, rapid inequality increases were not limited to the first two years of the 1980s recession, but continued for the rest of the decade. It is not yet apparent whether the inequality increases in the latest recession are the beginning of a similar long-term trend or a temporary blip.

## Method of accounting for shifts in median income and income inequality

While it is valuable to document trends in median income and income inequality within and across business cycles, it is more useful for policymakers and analysts to know what factors account for these trends. This report considers these factors using a shift-share analysis similar to that used by Burtless (1999), Iceland (2003), Daly and Valetta (2006), and Larrimore (2010). To separately account for the impact of each factor in median income and inequality changes during the first two years of the past four economic downturns, the distribution from the peak year prior to each downturn is changed one factor at a time.

For example, to account for the impact of the changing racial composition of the country while holding all else constant, it is assumed that the income distributions of white, black, and Hispanic individuals are unchanged from the economic peak. But the percentage of the population in each of these groups is allowed to shift to match actual population trends. The median income change

accounted for by the changing racial composition of the population is the shift that results from this change alone. The other demographic variables considered are the individual's age and the marital status of the household head.

Also considered were the employment status of the household head and their spouse along with the trends in the distribution of income from several sources: the labor earnings of male or female household heads and their spouses; the labor earnings of other members of the household; earnings from private non-labor income sources; and earnings from public-transfer programs. These sources sum to total household income in the CPS data. Although we are also interested in the employment and earnings of all household members, here we will primarily focus on the importance of changes in the earnings and employment of the primary members of a household on that household's income. That is, on the household head and, if that head is married, on his or her spouse. Hence in all cases when we discuss changes in male or female earnings or employment we mean changes in male or female heads and their spouse's earnings or employment. We do this both because the household head and spouse are in most cases the primary earners in a household (they are defined in the CPS as the primary owners or primary renters of the dwelling) and because their earnings and employment outcomes are correlated.

To separately consider the change accounted for by shifts in the distribution of income sources, the distribution of that income source — conditional on age, race, and marital status as well as employment — may change, but all other income sources and their correlation cannot. To avoid double-counting effects, the impact of each factor is considered conditional on the previously considered factors. For example, the changes accounted for by declining marriage rates are calculated conditional on the age and race of the individual. For more details on the specific procedures used to evaluate the contribution of each factor, see Larrimore (2010).<sup>10</sup>

## Accounting for shifts in median income during economic declines

The first four values in Row 1 of Table 2 provides the same information as the first column of Table 1. The rest of Table 2 show how much each named factor accounts for these trends using the shift-share method described above. Columns 1-4 of Table 2, which explore the first two years of each economic downturn and thus provides a balanced period of analysis. Later, we will compare Columns 5-7 to observe factors accounting for changes over all years of each recession. This analysis starts with three major demographic trends: an aging population, a more racially

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<sup>10</sup> As with all shift-share analyses, a potential concern is that the order of analysis may impact the results due to the interaction between the considered factors. While this concern cannot be completely eliminated without analyzing all possible analysis orders, it is mitigated here for several reasons. First, in a similar analysis of inequality changes over the past 30 years, Larrimore (2010) analyzed effects in both the order of those presented here and its reverse and found that the results were largely consistent. Since interaction effects should increase with longer time periods, this concern is smaller for our analysis of just the recession periods. Additionally, since our primary analysis is comparing effects in the same way across different business cycles, the comparison will be impacted only if interaction effects differ substantially from one period to the next. Since there is no reason to expect this to be the case, we do not expect the order of analysis to impact our findings greatly.



and ethnically diverse population, and the decline in the population's marriage rate.<sup>11</sup>

Rows 2 through 4 of Table 2 illustrate the change in median income accounted for by changes in the demographic makeup of the country. These estimated effects focus exclusively on changes in the number of people in the demographic groups and not on changes in the income gaps between these groups over the various recession years. This latter change will be captured in the decomposition of changing source-level income distributions below.

As demographic factors rarely change substantially over the two-to-four year period of a recession, they are included largely as controls. But the median income trend accounted for by the population's changing racial composition is large enough to warrant further attention.

As seen in Table 3, since 1979 the Hispanic share of the population has increased and this increase has accelerated in recent years. From 1979-1981, the Hispanic share of the population grew just 0.06 percentage points per year (0.12 percentage points over the two-year period). In contrast, it grew over five-times as fast at approximately 0.35 percentage points per year or by 0.70 percentage points over the two-year period 2007-2009.<sup>12</sup> While these changes may seem small, given that the mean size-adjusted household income of Hispanics has recently been around 60 percent of that of whites (last column of Table 3), a small increase in the Hispanic share of the population can translate into sizable shifts in median income. As seen in Row 3 of Table 2, during the first two years of each business cycle, decline in the increase in racial minorities accounted for at least a 0.19 percent reduction in median income, holding constant each racial group's income distribution. In the most recent recession, the 0.72 percent decline in median income accounted for by changing racial compositions account for more than 10 percent of the total 6.05 percent drop in median income.

This does not imply that increases in racial diversity are deterministic. These findings are the result of persistently wide racial income gaps over the past four decades. That is, mechanistically our shift share analysis is showing that as long as the distribution of income of minority group members is to the left of the income distribution of whites (i.e. a greater percentage of the minority population is at lower income levels than are whites), increases in their share of the population is likely to reduce overall median income. For this not to be the case their income distribution would have to move to the right (i.e. a greater percentage of the minority members would have to command income above the old overall median level).<sup>13</sup> Given that the U.S. population is expected to become increasingly more Hispanic over the next four decades, it may

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<sup>11</sup> Aging patterns are considered using four categorical age groups: children (0-18), young adults (19-44), older adults (45-64) and the aged (age 65 and older). Races considered are white non-Hispanic, black, and Hispanic. Other races besides blacks and Hispanics are included with white non-Hispanics because the small size of these groups prevents analyzing them separately. Marital status is the marital status of the household head, who can either be married, a single male, or a single female.

<sup>12</sup> Changes in the racial composition come both from differences in the birth and death rates of individuals of different races and differences in immigration rates. However, distinguishing between racial trends from immigration and from birth and death patterns is beyond the scope of this paper.

<sup>13</sup> Over this period, at both the peaks and troughs of business cycles, incomes of blacks have consistently been approximately 60 percent those of whites. In contrast, the ratio of the incomes of Hispanics compared to the incomes of whites has fallen over the past 4 decades from 68 percent in 1979 to 59 percent in 2009.

**Table 2: Factors accounting for changes in median size-adjusted household income of persons during the first two years of economic downturns and during each full economic downturn**

	1979-1981 (1)	1989-1991 (2)	2000-2002 (3)	2007-2009 (4)	1979-1983 (5)	1989-1992 (6)	2000-2004 (7)
(1) Percentage change in median income	-4.89	-3.96	-2.46	-6.05	-5.60	-4.01	-3.55
<i>Change accounted for by:</i>							
(2) Age	0.06	-0.07	0.28	0.00	0.14	-0.04	0.56
(3) Race	-0.19	-0.26	-0.73	-0.72	-0.43	-0.33	-1.32
(4) Marriage	-0.30	-0.37	-0.42	-0.11	-0.43	-0.43	-0.39
(5) Male Employment (a)	-1.07	-1.25	-0.91	-2.92	-2.07	-1.40	-1.07
(6) Male Earnings (a)	-2.95	-1.36	0.72	-1.01	-3.54	-1.55	0.00
(7) Female Employment (a)	0.34	0.43	-0.63	-0.79	0.81	0.72	-0.74
(8) Female Earnings (a)	-0.03	0.04	0.91	0.03	0.61	0.57	0.76
(9) Spouse Correlation	-0.17	-0.03	0.51	-0.47	-0.48	0.15	0.37
(10) Earnings of Others in Household	-1.06	-0.84	-1.11	-0.65	-1.34	-1.45	-1.23
(11) Earnings of Others Correlation	0.01	0.11	-0.37	-0.11	-0.09	-0.15	-0.38
(12) Private non-labor income	0.66	-0.57	-1.15	-1.24	1.32	-1.15	-0.45
(13) Private non-labor correlation	-0.19	0.00	0.17	0.31	-0.29	0.14	0.23
(14) Public Transfers	0.05	0.21	0.21	1.75	0.21	0.62	0.17
(15) Public Transfers Correlation	-0.04	0.04	0.14	-0.08	0.02	0.28	-0.04

Source: Authors' calculations using Public Use March CPS Data (1980-2010).

Notes: (a) household heads and the spouses of household heads

**Table 3: Racial characteristics of the U.S. population and size-adjusted household income by race during the first two years of economic downturns (in 2009 dollars)**

	White			Black			Hispanic			Income Ratio		
	%	White mean income	% Black	Black mean income	Black / White	% Hispanic	Hispanic mean income	Hispanic / White				
1979	82.45	36388	11.48	21534	59.18	6.08	24598	67.60				
1981	82.11	34919	11.69	20400	58.42	6.20	23059	66.04				
Change	-0.34	-1468	0.21	-1134	-0.76	0.12	-1538	-1.56				
% Change		-4.035		-5.27			-6.25					
1989	79.48	42577	12.09	24745	58.12	8.43	25873	60.77				
1991	78.98	40771	12.20	23902	58.62	8.82	24455	59.98				
Change	-0.50	-1806	0.11	-843.2	0.51	0.39	-1418	-0.79				
% Change		-4.24		-3.41			-5.48					
2000	75.17	51379	12.55	31556	61.42	12.28	29111	56.66				
2002	73.72	50203	12.50	31074	61.90	13.78	30183	60.12				
Change	-1.45	-1175	-0.05	-481.9	0.48	1.50	1072.2	3.46				
% Change		-2.29		-1.53			3.68					
2007	71.9	51561	12.68	31775	61.63	15.42	30185	58.54				
2009	71.16	49833	12.72	30191	60.58	16.12	29381	58.96				
Change	-0.74	-1728	0.04	-1585	-1.04	0.70	-804.6	0.42				
% Change		-3.35		-4.99			-2.67					

Source: Authors' calculations using Public Use March CPS Data (1980-2010).

prove difficult to return to periods of substantial median income growth over this and subsequent recessions without addressing this underlying divide in Hispanic incomes.

Even though demographic trends are important in accounting for long-term trends by providing a baseline for changes during both periods of economic growth and decline, they alone are not sufficient to account for the rapid changes that occur in median income during recessions. Thus, we now shift our attention to changes in specific income sources. It is here that the differences between this recession and previous recessions become most apparent.

In considering the impact of all earnings changes on household income in Table 2, we first focus on the household head and his or her spouse, if applicable. (In the CPS data, individuals are defined as household heads if they are the primary owners or primary renters of the dwelling.) Rows 5 and 6 of Table 2 focus on male heads and spouses. Rows 7 and 8 focus on female heads and spouses. Household heads and spouses make up 78 percent of people over age 18 in 2009, representing 86 percent of all U.S. labor earnings in 2009.

Row 5 of Table 2 shows that during each recession since 1979, the employment rate of these males declined, which accounts for some of the reduction in median household income. However, the decline in median income accounted for by their employment declines was substantially greater during 2007-2009 (2.92 percentage points) than any of the previous three recessions and nearly 2 percentage points greater than 1979-1981.

In contrast, as can be seen in Row 6 of Table 2, the decline in median income accounted for by changes in the earnings distribution of these men who were still employed during the 2007-2009 recession (1.01 percentage points) was substantially smaller than the 2.95 percentage point decline during 1979-1981. Thus, declining male employment rates and not declining male wage earnings accounted for the severity of the first two years of the Great Recession: a dramatic difference from the first two years (1979-1981) of the last great recession.<sup>14</sup>

The first four columns of Table 4 provide an explanation for the changing importance of male earnings and employment on median size-adjusted household income. Over recession years 1979-1981, the decline in male full-time employment (2.81 percentage points) was much smaller than over 2007-2009 (6.81 points). However, the mean earnings of full-time male workers over recession years 1979-1981, dropped by over 4.57 percent, compared to a 2.27 percent drop between 2007-2009. Part-time male employment partially offset these declines in full-time employment, but not enough to fully counteract the median income declines from the earnings and employment changes of full-time male workers.

One potential explanation for this result is the different influence of inflation over the two periods. During 2007-2009, inflation was at historic lows (-0.4 percent in 2009 based on the CPI-U-RS) while during 1979-1981 inflation was very high (9.5 percent in 1981 based on the CPI-U-RS). Since nominal wages rarely fall, in periods of low inflation it is difficult to lower real

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<sup>14</sup> References to male or female earnings or employment always refer to that of the male or female household head and their male or female spouse, while references to other labor earnings refer to that of all other members of the household regardless of gender.

**Table 4: Employment and earnings of household heads and their spouses by gender during the first two years of economic downturns (in 2009 dollars)**

	Males				Females			
	Percent employed Full-Time	Mean FT Earnings	Percent employed Part-Time	Mean PT Earnings	Percent employed Full-Time	Mean FT Earnings	Percent employed Part-Time	Mean PT Earnings
1979	63.42	55459	19.36	26687	26.99	30374	29.59	11429
1981	60.61	52926	20.66	24563	27.82	30255	28.51	11167
Change	-2.81	-2533	1.30	-2124	0.83	-120	-1.08	-261
% Change		-4.57		-7.96		-0.39		-2.29
1989	62.39	59487	17.77	26811	33.92	36196	27.01	14246
1991	59.39	56959	19.82	25510	34.61	36417	26.45	14499
Change	-3.00	-2528	2.05	-1300	0.69	221	-0.56	253
% Change		-4.25		-4.85		0.61		1.78
2000	64.6	68345	14.20	31132	40.35	42352	23.81	18778
2002	62.05	68145	15.71	32267	39.3	44569	23.63	19192
Change	-2.55	-199	1.51	1135	-1.05	2217	-0.18	415
% Change		-0.29		3.65		5.23		2.21
2007	62.76	66485	14.62	33290	40.95	45690	21.84	20196
2009	55.95	67994	18.79	28563	38.65	47104	22.60	19549
Change	-6.81	1509	4.17	-4726	-2.30	1413	0.76	-647
% Change		2.27		-14.20		3.09		-3.20

Source: Authors' calculations using Public Use March CPS Data (1980-2010).



wages, which may lead firms to increase their reliance on layoffs to cut costs. In contrast, during periods of high inflation, real wages can fall more easily; it is possible that inflation, especially if it is unexpected, can help blunt unemployment increases by making cuts in real wages easier.

A similar picture emerges when considering the employment and earnings of female household heads and spouses (Rows 7 and 8, Table 2). During the 1979-1981 and 1989-1991 periods, their employment grew despite the recession and therefore offset other factors accounting for declining median income. The strength of the long-term secular movement of women into the work force during the 1970s and 1980s was large enough to overcome cyclical employment declines during recession years, and resulted in their continued employment growth over this entire period. However, by the 2000s, the secular movement of women into the work force slowed and no longer offset cyclical declines in female employment during recession years.<sup>15</sup> Thus, in 2007-2009 female employment fell and accounted for a 0.79 percentage point decline in median income. As with the employment of their male counterparts, this female trend is a reversal from 1979-1981.

The combined decline in male and female employment in Rows 5 and 7 of Table 2 accounted for a 3.71 percentage-point decline (2.92 plus 0.79) or 60 percent of the 6.05 percentage-point decline in median income over the first two years of the Great Recession. In contrast, the combined decline in male and female employment over 1979-1981 accounted for only a 0.73 percentage point decline (-1.07 + 0.34) or 15 percent of the decline in median income over that period.

Row 9 of Table 2 accounts for another factor related to the earnings patterns of the household heads and spouses discussed above — the correlation of their earnings. The extent to which layoffs or wage reductions of spouses are correlated can impact where in the distribution income declines are most pronounced. During 2007-2009, the wage earnings of spouses became more correlated and this increased correlation accounted for further declines in median income beyond that seen at the start of earlier recessions. This is in marked contrast to 2001-2003, where spouses' earnings became less correlated and actually accounted for a rise in median income. It is not clear, however, whether this difference reflect changes in the correlation of spouses' industries or if it comes from differences in the extent to which recessions have large localized effects on communities where a husband and wife work, even if they are in different industries. Finding the pathway for the different correlation patterns may be an avenue for future research.

Declines in the employment of male and female household heads and spouses discussed above accounted for greater reductions in median income than in previous recessions. Yet the median income decline during the current recession accounted for by declines in the labor earnings of other household members was smaller than in previous recessions (Row 10, Table 2). However,

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<sup>15</sup> Blau and Kahn (2007) document the slowdown in female labor supply growth in the 1990s. More recent statistics from the Bureau of Labor Statistics (2011) indicate that female labor force participation for adults age 16 and over peaked in 2000 and has fallen over the past decade. Blau and Kahn (2007) also find that the cross-price elasticity of female employment to their husband's wages has declined since the 1980s, which suggests that women are now less likely to increase their employment to compensate for a decline in their husband's wages.



this result may in fact be a further indication of the severity of the recession. It is possible that this smaller-than-usual drop in the earnings of others in the current household during the Great Recession may come from an increase in previous household heads or spouses moving in with relatives or friends to weather the economic storm, thus increasing the number of adults in a household who are no longer heads or spouses yet who may be employed and earning wages.<sup>16</sup>

Although labor earnings receive more attention during recessions, non-labor income (e.g. interest or dividends) and public transfers (e.g. Unemployment Insurance (UI), social security or cash welfare) are important components of many households' incomes. As such, changes to these income sources also can account for changes in median income during recessions.

Column 1 of Table 5 provides details on the changes in mean size-adjusted non-labor income during each of the past four recessions: Mean private non-labor income fell by 10.95 percent over the first two years of the Great Recession, due in part to the decline in real interest rate observed during this period. Yet during the first two years (1979-1981) of the 1980s recession, inflation fears increased real interest rates, pushing up private non-labor income by 5.03 percent.

**Table 5: Mean size-adjusted income sources, first two years of economic downturns (in 2009 dollars)**

	Mean Private Non-Labor Income	Mean Public Transfer Income	Mean Total Private Income
1979	3042	2410	31557
1981	3196	2520	29967
Change	153	110	-1590
% Change	5.03	4.57	-5.04
1989	4457	2542	36471
1991	4222	2728	34545
Change	-235	186	-1926
% Change	-5.27	7.30	-5.28
2000	4522	2798	43358
2002	3904	2960	42094
Change	-620	162	-1264
% Change	-13.71	5.77	-2.91
2007	4474	2963	42792
2009	3984	3710	40327
Change	-490	747	-2464
% Change	-10.95	25.20	-5.76

Source: Authors' calculations using Public Use March CPS Data (1980-2010).

<sup>16</sup> For example, during the recession years 1979-1981, the mean household size for the middle quintile of the income distribution fell from 3.86 to 3.74 people. In contrast, during the recession years 2007-2009 the mean household size of the middle quintile of the income distribution grew from 3.38 to 3.46 people.

This decline in private non-labor income during the Great Recession (Row 12, Table 2) was quite important in accounting for declining median income, especially when compared to the 1979-1981 period. Declines in private non-labor income during this recession accounted for a 1.24 percentage point decline in median income, which was greater than the 1.01 point decline accounted for by the falling wage earnings of employed male in Row 6 of Table 2. While reduced pensions, smaller dividends and low interest on savings accounts undoubtedly impact those with high incomes, Row 12 of Table 2 shows that the decline in private non-labor income also accounts for declines in the income of the median American as well.

Also important for many households, especially during recessions, is public transfer income. The growth in public transfers during each recession can be seen in the column 2 of Table 5. Although public transfers such as UI increase during all recessions, the extent of this increase in the most recent recession well surpasses that of the earlier three periods. While mean household size-adjusted public transfers per person increased by 4.57 percent during recession years 1979-1981, they increased by 25.20 percent or from \$2,963 in 2007 to \$3,710 in 2009. During this period UI benefits were extended to 99 weeks, an unprecedented extension in this program, at the same time that the criteria for establishing eligibility based on past work for UI benefits were relaxed. This substantial increase in mean public transfer income (\$747) during the first two years of the Great Recession importantly mitigated the mean decline from all sources of private income of \$2,464 reported in column 3 of Table 5. Burtless (2010) observes that in 2009, American Recovery and Reinvestment Act stimulus spending represented 1.25 percent of the national economy and twice that in 2010. Based on the increase in government transfer income, which was much larger than that seen in previous recessions, clearly these programs increased the short-term pre-tax income of many individuals.

As can be seen in Row 14 of Table 2, this increase in public transfers during the first two years of the Great Recession offset the declines in private sector income to a much greater extent than that seen in earlier recessions. While changes to public transfers programs during recession years 1979-1981 only offset declines in median income by 0.05 percentage points, public transfers mitigated median income declines by 1.75 percentage points in the 2007-2009 period. Thus, at least in the short-run, it appears that the increase in public transfers—especially the growth and extension of UI benefits beyond that seen in previous recessions and the automatically triggered eligibility for means-tested transfer programs—mitigated the negative effects of the recession on median income.

A limitation of shift-share analysis is that its results do not demonstrate causality. Thus, it is possible that the substantial increase in UI and other public transfers during this period could have delayed a return to work and hence partially contributed to the drop in employment discussed above.<sup>17</sup> Similarly, it is possible that the layoff of one spouse may impact the employment decision or work effort of the other, resulting in indirect effects that would alter the

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<sup>17</sup> Jurajda and Tannery (2003) and Meyer (1990) suggest that this is the case. For an early review of the literature on the relationship between increasing unemployment compensation and the duration of unemployment, see Danziger, Haveman, and Plotnick (1981).

magnitude of each factors causal relationship with median income. Nevertheless, these results demonstrate that the direct effect of these payments had a substantial mitigating effect on median income declines over this period.

## Accounting for shifts in income inequality during economic declines

The same procedure used to explore factors accounting for median income trends during the Great Recession and previous economic downturns can also be used to consider the factors accounting for trends in income inequality during these periods. Table 6 provides such information, with the first row providing the observed change in income inequality in the first two years of each downturn and the remaining rows illustrating the factors accounting for the trend.

Similar to that seen for median income, rising inequality during the Great Recession starts with an underlying increase accounted for by demographic trends. As was the case for median income, increased racial diversity was the most important of the three demographic factors reported in Table 6, accounting for a 0.12 percent increase in inequality during the Great Recession. However, this is only about 5 percent of the total increase in inequality.

While the overall increase in inequality is similar during 2007-2009 and 1979-1981, the non-demographic factors accounting for this rising inequality are quite different. The first two years (2007-2009) of the Great Recession saw substantial increases in inequality accounted for by falling male employment (1.18 percentage points), increasingly unequal male earnings (0.77 percentage points), falling female employment (0.50 percentage points), and increasingly unequal female earnings (0.49 percentage points).<sup>18</sup>

Additionally, as employment and wages of spouses became increasingly correlated, these trends accounted for a further 0.23 percentage point increase to inequality. The combined effect of these factors accounted for inequality growth of 3.16 percentage points during this period.

In contrast, the first two years (1979-1981) of the 1980s recession saw substantially smaller amounts of inequality growth accounted for by these factors with the exception of correlated spouses' earnings (0.23 percentage points). As a result, the combined effect of these factors accounted for inequality growth of only 1.30 percentage points, considerably less than the 3.16 percentage point increase during the first two years of the Great Recession.

So why then was inequality growth in these two recessions so similar? They both had similar inequality increases accounted for by other members of a household's labor earnings and inequality declines accounted for by changes in the private non-labor income distribution. It is the dramatic increases in public transfer program benefits during the first two years of the Great

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<sup>18</sup> As was the case in our creation of Table 2, Table 6 focuses on how much the changes in the earnings and employment of male and female household heads and their spouses account for an economic outcome. But in this case it is changes in the household size-adjusted distribution of income as measured by a Gini coefficient. Males and females considered here are the primary members of the household.

**Table 6: Factors accounting for changes in the Gini coefficient of size-adjusted household income of persons during the first two years of economic downturns and during each full economic downturn**

	1979-1981 (1)	1989-1991 (2)	2000-2002 (3)	2007-2009 (4)	1979-1983 (5)	1989-1992 (6)	2000-2004 (7)
(1) Percentage change in Gini coefficient	2.09	-0.81	0.43	2.20	5.77	0.62	1.39
<i>Change accounted for by:</i>							
(2) Age	-0.09	0.07	0.04	0.04	-0.14	0.12	0.09
(3) Race	0.06	0.11	0.24	0.12	0.15	0.17	0.34
(4) Marriage	0.27	0.33	0.16	0.04	0.45	0.31	0.22
(5) Male Employment (a)	0.49	0.41	0.30	1.18	0.88	0.49	0.28
(6) Male Earnings (a)	0.48	-1.24	-0.36	0.77	2.07	-0.38	-0.46
(7) Female Employment (a)	0.01	-0.09	0.36	0.50	-0.05	-0.15	0.52
(8) Female Earnings (a)	0.09	0.19	0.33	0.49	0.53	0.24	0.50
(9) Spouse Correlation	0.23	-0.03	-0.30	0.23	0.56	-0.03	-0.20
(10) Earnings of Others in Household	0.37	-0.03	0.68	0.44	0.97	0.32	0.77
(11) Earnings of Others Correlation	0.25	0.01	-0.08	0.03	0.48	0.05	-0.14
(12) Private non-labor income	-0.04	0.01	-0.25	-0.09	-0.39	0.29	-0.07
(13) Private non-labor correlation	-0.07	-0.20	-0.44	-0.29	0.19	-0.25	-0.28
(14) Public Transfers	-0.02	-0.30	-0.22	-1.20	-0.06	-0.45	-0.11
(15) Public Transfers Correlation	0.06	-0.08	-0.01	-0.02	0.15	-0.08	-0.03

Source: Authors' calculations using Public Use March CPS Data (1980-2010).

Notes: (a) household heads and the spouses of household heads

Recession that accounted for over a full percentage point greater drop in inequality beyond that provided by public transfer increases over 1979-1981. Thus, the direct effect of public transfer increases had a major mitigating effect on inequality growth well beyond that seen during any of the previous recessions and accounts for why inequality growth was not substantially greater than during the first two years of the 1980s recession.

## Median income and inequality changes over full recessions

Thus far we have focused on the first two years of each recession since 1979. While the vast majority of median income declines occurred during the first two years of each of these recessions, it is possible that the factors accounting for the trends at the tail-end of recessions differ than those in the first two years. Therefore, it is natural to ask whether the patterns for the full periods of economic decline match those observed thus far. To address this, Columns 5 through 7 of Tables 2 and 6 provide a similar analysis of trends in median income and income inequality to those discussed above, but do so comparing the peak year of each business cycle to the trough year of that cycle rather than focusing solely on the first two years of each recession. No full business-cycle information is provided for the most recent recession, as data beyond 2009 is not yet available.

Looking first at median income trends in Table 2, by definition when we include all years of a given recession, the median income decline is greater than when we focus on the first two years of that recession.<sup>19</sup> Nevertheless, when we do so for each of the previous three recessions, the full-business-cycle median income decline is still smaller than that seen over the first two years of the Great Recession. This highlights the severity of the current recession.

In general, the factors accounting for declines in median income over the full recessions are comparable to those for the first two years. A few factors, such as declines in male employment, account for further median income declines once all recession years are considered. This is especially the case in the double-dip recession of 1979-1983, where a substantial number of jobs were lost late in the business cycle. Others, such as changes in private non-labor income during that same recession, account for smaller declines or greater median-income increases over all years rather than during the first two years alone. But the overall patterns of the severity of median-income declines and the factors accounting for the declines are substantively similar to those seen when analyzing just the first two-year periods. This is especially true with regards to our main finding that the mitigating effect of public transfers on short-term median income declines in the Great Recession well surpasses that seen in earlier recessions.

When looking at income inequality there are more differences between the first two years of each recession and the full period of economic decline. This starts with the simple trend in inequality. In the second-half of each previous recession, 1981-1983, 1991-1992, and 2002-2004,

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<sup>19</sup> When comparing periods of different lengths it is common to annualize changes to account for the different periods of analysis. Since the majority of median income declines occurred in the first two years of each recession period, the annualized declines for each full recession are smaller than those for the first two years. Decompositions of annualized median income and inequality changes for each recession are available upon request from the authors.

inequality growth accelerated. As a result, in all cases the inequality growth from the full decline is more than double that from the first two years of the recession (and in the case of 1989-1992 switched directions from inequality declines to inequality growth).

Focusing on the 1979-1983 recession, which was most similar in terms of inequality growth to the Great Recession for the first two years, much of the additional income inequality increase in the full recession came from further growth in labor-earnings inequality. In the first two years of the 1979-1983 recession, inequality growth from male employment and male earnings changes were approximately the same with each accounting for nearly 0.5 percent of the 2.09 percent income inequality growth. But in the second half of the recession, male earnings inequality substantially increased, accounting for 2.07 percent of the 5.77 percent increase in inequality over the full recession. This also was the case for women, as female earnings changes accounted for only a 0.09 percent increase in inequality in the first half of the recession but a 0.53 percent inequality increase for the full period. This suggests that at the tail-end of the 1979-1983 recession, high-earners began seeing their income stabilize faster than low-earners, which helps us understand the acceleration of inequality during this period. At the same time, however, public transfers, which accounted for only a slight decline in inequality in the first two years of the 1979-1983 recession, continue to do so over the entire period.

It remains to be seen whether inequality growth in the current recession will follow the path of earlier recessions by accelerating as we approach the business cycle trough. The increase in inequality over the first two years of the Great Recession was approximately the same as the increase in inequality over the first two years of the recession of 1979-1983, but Table 6 shows that the factors underlying these trends differ. Given that the temporary public-transfer increases which successfully mitigated inequality growth for the past two years cannot continue indefinitely, it will undoubtedly be a challenge to limit further inequality growth while scaling back these programs.

## Conclusions

Median income fell at a faster pace over the first two years of the Great Recession than over the first two years of any other recession since the CPS first began releasing annual individual level data in 1968. In addition, income inequality rose at a rate matching inequality increases over the first two years of the 1979-1983 recession. While falling real earnings of males and the increased inequality of male and female earnings contributed to these trends, they did so at a pace similar to previous recessions. The distinguishing characteristic of this recession is, instead, the extent to which employment declines account for lowered median income and increased inequality. The combined contribution of falling male and female employment on median income declines (3.71 percentage points) is far greater than that from any of the past recessions documented here. Similarly, these declines in employment combined to account for inequality growth that is far faster than any of the previous three recessions.

We also show that the direct effect of public transfers largely accounts for why median income declines and inequality growth were not more severe during the first two years of the Great Recession. The expansion of public transfers far exceeded that of earlier recessions and the direct impact of these program benefits offset declines in private sector income. A potential drawback is that the extension of unemployment benefits and the increase in other government transfers



may have indirectly discouraged work over the period. Thus, we cannot rule out the possibility that increased public transfers lengthen unemployment spells and thus degrade labor-market skills, so that the benefits of these programs during the first two years of the Great Recession may be offset by making a return to work and wage earnings during the coming recovery more difficult for these workers.

While inequality growth in the first two years of the Great Recession matched that of the early 1980s recession, it is important to recognize that the inequality increases of the 1980s extended far beyond the recession years of 1979-1981. Our observations for 2007-2009 may or may not reflect such a long-term trend. How median income and income inequality will change over the remainder of the current business cycle and beyond will depend on our ability to return individuals to the labor market via a growing economy as we scale back the temporary public-transfer programs which limited median-income declines and inequality growth over the past two years.

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