

Income Instability and the Response of the Safety Net

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Abstract: This paper examines the response of safety net transfer and tax programs to earnings and income shocks across recessions since the early 1980's. Safety net programs in the U.S. are designed to dampen economic instability and maintain basic needs for families. Such programs, including TANF, SNAP (food stamps), and the Earned Income Tax Credit (EITC), have been tested during and between recessions of the past 30 years, including the recent 2007-2009 Great Recession. I use matched data in the March Current Population Survey (CPS) from 1980-2012 to estimate pre and post-transfer income instability over the 1980s, 1990s, and 2000s, as well as across recessions. The results are disaggregated by family structure, race, income, and education. Transfer programs are associated with lowered instability levels and flatter trend growth from 1980-2012 among socio-economically disadvantaged subgroups, while the tax system reduces income instability for families in the top 40th percentile of the income distribution. Although the largest instability reductions occur among the poor, since 1980 the safety net appears less responsive to instability for the bottom income quintile, female-headed families, and black families.

JEL Codes: I38, J63

1. Introduction

The Great recession and financial crisis of 2007-2009 tested the capabilities of fiscal and monetary policy in the United States (U.S) and throughout OECD countries (Elsby, Hobijn, and Sahin 2010). In the U.S., unemployment peaked at 10 percent in October 2010 (BLS 2012) and poverty rates rose to 15 percent by 2011, with even higher poverty among children, racial, and ethnic minorities (DeNavas-Walt and Proctor 2014). The size of the Great Recession motivated the American Recovery and Reinvestment Act (ARRA) of 2009, an \$833 billion fiscal stimulus of elevated spending and tax cuts (CBO 2012) that boosted spending on “safety net” transfer programs including the Supplemental Nutrition Assistance Program (SNAP) (food stamps), the Earned Income Tax Credit (EITC), and Unemployment Insurance. Whether within or between recessions, programs like these are designed to absorb negative economic shocks, but much of the evidence surrounding safety net effectiveness focuses on income, employment, and poverty *levels*; less emphasis has previously been given to understanding the stabilization or smoothing of incomes via multiple transfer programs, especially among socio-economically disadvantaged groups (Ben-Shalom, Moffitt, and Scholz 2012; Larrimore et al. 2014; Shaefer and Edin 2013).

This paper provides new information on effectiveness of social safety net programs as buffers against earnings and income *changes*, or instability. Using data from the Current Population Survey (CPS), I calculate income instability from 1980-2012 across family structure, race, income, and educational attainment to highlight socioeconomic groups historically at higher risk for poverty. I focus on business cycles to highlight the role and importance of safety net programs during periods of relative economic hardship, but I also find and report persistently high income instability between recessions for socio-economically disadvantaged families. To

measure instability, I construct 3 definitions of income: (1) income without safety net transfer spending programs or taxes, (2) income inclusive of safety net transfer spending programs, and (3) income inclusive of safety net transfer spending programs and taxes. Using these definitions, I follow CBO (2007), Dahl et al. (2011) and Ziliak et al. (2011), defining income instability as the standard deviation of the arc percent income change using the definitions described above to test the collective income-smoothing characteristics of transfer programs and the tax system, the way families practically experience the safety net (Currie 2006).

Across all U.S. families, transfer programs lower family income instability by 18 percent since the early 1980s, and the trend after accounting for the safety net is relatively stable towards the end of the 2000s. For lower and middle income families, as well as those headed by a high school graduate, the transfer and tax system effectively halts the growth in instability during the late 2000s. Although safety net transfer programs lower the level of instability, over a 30-year period there is evidence of a decline in the responsiveness of the U.S. safety net to rising instability over time for female-headed families, black families, and families in the bottom income quintile.

2. Background on Income Instability and the Safety Net

a. Policy Relevance

Income instability occurs via workers' fluctuating earnings and incomes, and is largely driven by labor force exits (Ziliak et al. 2011). Regarding the policy significance of instability, constant relative risk aversion utility models show that individuals experience lowered utility in the event of unstable income and seek insurance against the risk from such instability; theoretical models consequently predict lowered consumption as a consequence of unstable and hard-to-predict

income (Attanasio and Weber 2010). For socio-economically disadvantaged families lacking precautionary savings or easy access to loanable funds (Gottschalk and Moffitt 2009), safety net programs may improve economic well-being by insuring against exposure to involuntary economic instability. For example, programs such as SNAP, the EITC, Unemployment Insurance, and public housing may allow families to better maintain food, housing, and education consumption patterns in response to income shocks and uncertainty. In the absence of such insurance mechanisms, income instability could harm the individual earner and their family via diminished child well-being, human capital investment, and development (Attanasio and Weber 2010; Gennetian et al. 2015; Hardy 2014; Hill et al. 2013). Again, this may be especially true for socio-economically disadvantaged families, already at a relatively higher risk of unemployment and poverty exposure (Hardy 2012; Keys 2008; Ziliak et al. 2011).

b. Measurement and Evidence of Income Instability

The measure of instability used in this study is the standard deviation of the two-year arc percent change of family income. To utilize this measure, I match survey-respondents in the CPS to create 2-year longitudinal panels (Ziliak et al. 2011). This, along with the relatively larger sample sizes of the CPS, allows me to compare the income-smoothing benefits of anti-poverty programs and tax policies across family structure, race, income, and education. Many earnings and income instability studies have used longitudinal data in the Panel Study of Income Dynamics (PSID) due to the literature's early emphasis on decomposing instability into its permanent and transitory components (Cameron and Tracy 1998; Celik et al. 2012; Dahl et al. 2011; Gittleman and Joyce 1996; Gottschalk and Moffitt 1994; Juhn and McCue 2010; Winship 2009). By using the CPS, the larger sample sizes of the 2 year matched pseudo-panel data allow

me to examine trends across socioeconomic subgroups with greater precision relative to traditional panel data sets in which subgroup sample sizes are oftentimes small.

As a summary measure, income instability captures permanent shifts related to structural change alongside transitory shocks more likely related to job loss, as well as any non-separabilities that might drive both theoretical components. Income instability, v_{it} , is defined as the standard deviation of the arc percent change:

$$(1) \quad v_{it} = \sqrt{\text{Var} \left\{ 100 * \frac{y_{it} - y_{it-1}}{\bar{y}_i} \right\}},$$

where y_{it} is income for person i in time t (CBO 2007; Dahl et al. 2011; Dynan et al. 2012; Ziliak et al. 2011).¹ I use a “midpoint” or arc percent change formula to reduce the influence of large income swings between years, so that the arithmetic mean in the denominator is modified as $\bar{y}_i = \frac{\text{abs}(y_{it}) + \text{abs}(y_{it-1})}{2}$, where $\text{abs}(\cdot)$ refers to the absolute value. Unlike the variance of log incomes, another popular approach used in the literature, it is defined even if incomes are zero in one of the two years, and it is symmetric and bounded below by -200 percent and above by +200 percent. Because higher instability for many derives from labor force dropout, person-year observations with zero earnings and/or incomes can account for persons entering and exiting the labor force. Using this approach, Dynan et al. (2012) find rising instability in the PSID through the early 2000s, while Ziliak et al. (2011) use matched-CPS and find a 15 percent rise in male earnings instability and declining female instability over a forty year period. Not all studies conclude that instability is rising (Dahl et al. 2011; Winship 2009). For example, Dahl et al. (2011) use the arc percent change measure of instability on administrative earnings records

¹ It is possible for a worker to have nonzero income that is equal but opposite in sign across years, and instead of averaging to zero the measure reports the average as the absolute value of one of the years. In practice this is not an issue and no observations are lost due to equal and opposite in sign earnings or incomes.

matched to the Survey of Income and Program Participation (SIPP), where they find no evidence of rising instability beyond the mid 1980s.

c. Changes to the Social Safety Net and the Economy

Policy changes within safety net transfer programs potentially alter their income smoothing effects. The bulk of safety net spending for the poor throughout the 1980s and early to middle 1990s was on cash assistance, but since the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996—also known as Welfare Reform—direct assistance for the poor and near-poor has steadily shifted away from cash assistance to SNAP and refundable tax credits, particularly the EITC (Danziger 2010; Guzman, Pirog, and Seefeldt 2013). SNAP provides near-cash assistance for low-income families by subsidizing food purchases. Meanwhile, the EITC operates through the tax code to subsidize low-wage work, providing refundable tax credits up to almost \$6,000 for qualifying families. Programs like Unemployment Insurance, Social Security, and Supplemental Security Income did not experience substantial policy reform since the 1980s. Public housing benefits did gradually transition to a program based less on place-based assistance and more on providing tenant-based cash vouchers for recipients to acquire housing in the private market; today most recipients of low-income housing assistance receive vouchers or tax credits as the nation’s public housing units decline in number (Collinson, Ellen, and Ludwig 2015).

[Figure 1]

That transfer programs and progressive tax systems historically respond in the event of job losses or hours reductions (Blundell, Pistaferri, and Preston 2008; Kniesner and Ziliak 2002; Parker and Vissing-Jorgenson 2009) leaves unanswered the magnitude of this response, whether

the pre post-transfer income instability relationship has changed since 1980, and whether these changes vary across subgroups. Throughout the 1980s and early 1990s, the U.S. safety net provided greater permanent income maintenance for low-income families, with fewer work requirements or time limits on benefit receipt (Ben-Shalom et al. 2013; Ziliak 2011). Confirming the importance of the aforementioned policy changes, government data from 1980-2012 in Figure 1 show that Aid to Families with Dependent Children (AFDC)/Temporary Assistance for Needy Families (TANF) cash welfare spending grew 50 percent from 1980 to 2000 (\$16.8 billion to \$25.2 billion), whereas SNAP spending fell 9 percent (\$20.2 billion to \$18.3 billion) and EITC spending grew 760 percent (\$4.5 billion to \$39.4 billion), respectively. Reforms to cash welfare, SNAP, and the refundable EITC throughout the mid 1990s and 2000s transitioned the U.S. safety net towards a more “work-based” system of programs for the poor (Moffitt 2014), depicted in Figure 1. The same spending data show that cash welfare expenditures are relatively flat during the 2000s, growing 5 percent from 2000 to 2012 (\$25 billion to \$27 billion), while EITC and food stamps/SNAP exhibit 59 (\$39.5 billion to \$63 billion) and 291 percent (\$18 billion to \$72 billion) expenditure growth respectively over this same time period. Food stamp expansions coincide with the implementation of the 1996 welfare reform that effectively capped spending on cash assistance. Expansions to the EITC in 1986, the early 1990s, and most recently 2009 (Ben-Shalom et al. 2012; Hoynes 2008) occur as well. Lastly, during recessions Unemployment Insurance expenditures increase, shown via the counter-cyclical pattern in Figure 1. Because unemployment is a social insurance program, workers qualify across the income distribution, explaining the near \$150 billion expenditure in 2010.

In addition to social welfare policy changes, evidence of rising income and earnings instability between the 1970s and 1980s (Dynan et al. 2012; Gottschalk and Moffitt 1994, 2009;

Haider 2001) coincides with warnings of economy-wide structural change (Autor et al. 2008; Jaimovich and Siu 2012), foretelling a shift of risk onto families with less educated workers (Hacker and Jacobs 2008).² A safety net promoting employment and temporary, time-limited income maintenance over this period raises the concern that recessions in the 2000s could be *riskier* for families lacking the education, private resources, or public transfers to absorb negative shocks to earnings (Blank 2008; Shaefer and Edin 2013). Controlling for state unemployment rates between 1980 and 2012, income instability is countercyclical across income and education groups, as shown in Table 1. The exception to the otherwise consistent countercyclical relationship are black families, for whom economic instability does not follow a business cycle trend but is instead uniformly elevated relative to other socio-economic groups. Even *if* labor market risk has intensified, the effectiveness of transfer and tax policies with respect to income instability requires program participation among eligible families experiencing a negative economic shock.

[Table 1]

The 2009 ARRA fiscal policy stimulus (CBO 2012) provided tax cuts and increased spending on income support programs, including benefit increases to the EITC as well as expanded unemployment insurance and SNAP coverage (CBO 2012; Elsby et al. 2010; Hardy et al. 2015; Monea and Sawhill 2009; Oh and Reis 2012; Ziliak 2011). Proponents of expansionary fiscal policies tout at least two benefits, one of which is enhanced liquidity among disadvantaged families with higher propensities to consume (Fisher, Johnson, and Smeeding 2014). These

² The baseline pre-tax and transfer income instability definition used here is primarily comprised of labor market earnings.

families can then boost aggregate demand, a second possible policy benefit (Ramey 2011). An additional benefit may be lowered income instability.

In assessing instability and the safety net, fiscal policy-driven spending or “stimulus” packages represent only one response to recessions (Bitler and Hoynes 2014; Moffitt 2015; Mulligan 2015; Mulligan 2012; Rothstein 2011). The 2009 ARRA was quickly followed by a “sequestration” policy of automatic spending cuts and tax increases (Zandi 2013), suggesting a lack of consensus with respect to optimal policy action during recessions. This debate spans the tradeoff between beneficial spending multiplier effects and adverse labor supply consequences (Blinder and Zandi 2010; Conley and Dupor 2011; Guzman, Pirog, and Seefeldt 2013; Larrimore et al. 2013; Mulligan 2015; Moffitt 2015; Taylor 2011), as well as concerns about short-term spending versus a rising debt-to-GDP ratio (Zandi 2013). On an individual level, income replacement could reduce the incentive to seek and maintain employment (Mulligan 2015), though recent estimates of work disincentives across safety net transfer programs appear to be small relative to their poverty-reduction benefits (Ben-Shalom et al. 2012). For these reasons taken together, the safety net—instability relationship over time is unclear.

3. Data

The information on families used in this study comes from the Annual Social and Economic Supplement of the Current Population Survey (CPS) for calendar years 1980-2012 (interview years 1981-2013). The focal variable is family income as reported by the household head, the unit of observation, measured using varying definitions to capture the role of safety net transfer programs and the tax system.³ The sample consists of household heads within families who are

³ Sample selection focuses on family income of the household head. Instability trends and levels using household income are qualitatively similar to those using family income. Specifically, household income instability levels are

between ages 25 and 60, where a family is defined as one or more persons related by birth, marriage, or adoption. I first estimate instability before taxes and transfer are accounted for. This earnings-based definition uses income from wages, child support, alimony, rent, interest, dividends, farming, pensions, and self-employment. Next, I construct a modified definition of income using the aforementioned pre-tax and pre-transfer earnings variables while introducing transfer income from cash assistance, referred to as Aid to Families with Dependent Children (Temporary Assistance for Needy Families after 1996), Social Security and Disability Insurance, Supplemental Security Income, General Assistance, the cash value of SNAP “food stamps,” the cash value of school lunches, housing assistance from public housing and the Section 8 voucher program, refundable EITC, and Unemployment Insurance payments from 1987 onward. A third definition of income incorporates taxes with earnings and social safety net transfers using the NBER TAXSIM program. Simulated taxes are the sum of federal, state, and payroll tax liabilities estimated yearly for each household head through 2012, and I use CPS constructed simulations for EITC values.⁴ The results are potentially biased by well-documented measurement errors via under-reported in-kind transfer income in the CPS and related survey data sets commonly used to examine income, poverty, and program participation questions (Bollinger and David 1997; Kreider et al. 2012; Meyer et al. 2009). This could understate the stabilizing impact of the safety net.

The CPS employs a rotating survey design so that respondents (family household head) are in the sample for 4 months, out 8 months, and in another 4 months. This makes it possible to match approximately one-half of the sample from one March interview to the next. Following

similar to family income instability levels after transfers are accounted for, consistent with findings by Hardy and Ziliak (2014). A related sensitivity check in Appendix Figure 1 depicts instability trends allowing for changing household headship between year 1 and year 2. The overall trends and levels are qualitatively similar to the baseline results shown in Figure 2.

⁴ EITC values from the CPS are robust to using NBER Taxsim-generated EITC values.

the recommended Census procedure I perform an initial match of individuals on the basis of five variables: month in sample (months 1-4 for year 1, months 5-8 for year 2); gender; line number (unique person identifier); household identifier; and household number. I then cross check the initial match on three additional criteria: race, state of residence, and age of the individual. If the race or state of residence of the person changed I delete that observation, and if the age of the person falls or increases by more than two years (owing to the staggered timing of the initial and final interviews), then I delete those observations on the assumption that they were bad matches. These additional criteria were important prior to the 1986 survey year, but thereafter the five base criteria match most observations.

Prior to matching across years, I exclude families with imputed income (Bollinger and Hirsch 2006) and I drop the top 5 percent of incomes annually to accommodate changing topcode values over time and the transition to a rank proximity swapping method from 2011 onward (U.S. Census 2013). See Larrimore et al. 2008 for a discussion of Census topcoding procedures. There were major survey redesigns in the mid 1980s and mid 1990s so it is not possible to match across the 1985-1986 waves and the 1995-1996 waves. This yields an interrupted time series across 32 years with gaps in calendar years 1984-1985 and 1994-1995. As indicated in Table 2, I have roughly 7,834 observations in an average year when a match is possible, and I match approximately 53 percent across survey years on average. All income and earnings data are deflated by the Personal Consumption Expenditure Deflator with 2009 as the base year, and basic summary statistics are provided in Table 3, which are fairly robust to the use of weights; weighted summary statistics are included in the last two columns of Table 3. The gender distribution largely reflects the fact that males are more likely to report head of household status. Consistent with the reported summary statistics across weighted and unweighted samples,

Figure 2 shows instability is relatively unchanged when comparing trends with and without CPS person-level weights.

[Table 2][Table 3]

4. Income Instability and Safety Net Transfers

Figures 2-5 depict 1980-2012 income instability using three definitions of family income: pre-tax and transfer income, income after accounting for the social safety net transfer programs listed above, and income after safety net transfer programs and both federal and state tax liabilities. Table 4 summarizes the instability estimates and percent reductions after transfers during recessions. It is important to note that this analysis does not account for behavioral responses that can occur with or without policy activity. Thus, I do not rule out pre-transfer instability or subsequent reductions in instability as being influenced or caused by events beyond the public policies accounted for in this analysis. Across family structure, race, income, and education, the summary of results focuses on pre versus after-transfer income instability levels across decades and between recessions. Due to the size of the 2007-2009 recession, I disaggregate the 2000s into two periods: 2000-2006 and 2007-2012. I then discuss subgroup instability trends since 1980.

[Figure 2]

Beginning with “All Families” in the top panel of Figure 2, safety net transfer programs are associated with a 19 percent average income instability reduction throughout the 1980s (0.55 to 0.45) and an 18 percent reduction throughout the 1990s (0.60 to 0.50). From 2000-2006 transfers are associated with 15 percent lower instability (0.63 to 0.54) and 17 percent lower instability from 2007-2012 (0.67 to 0.55). Looking over recessions from 1981-1983, 1990-1992, 2001-2003, and 2007-2009, transfers are associated with instability reductions of 20, 18, 14.5,

and 15 percent. Transfer programs include cash assistance from AFDC/TANF, Social Security disability and supplemental security cash payments, food assistance payments from food stamps/SNAP and school lunches, refundable EITC, and unemployment insurance payments (from 1986 onward). Table 4 provides the full set of instability estimates over the 4 recessions spanning 1980-2012 for “All Families” as well as sub-group families at higher risk of poverty and unemployment (DeNavas-Walt and Proctor 2014).⁵

Pre-tax and transfer family income instability rises 35 percent between 1980-2012 and 21 percent from 1980 to 1999. The trend stabilizes from 2000-2006 (0.01 percent growth) and then rises 8.5 percent to 0.66 throughout the 2007-2009 period. Given that employment was slow to recover in the immediate aftermath of the Great Recession (Elsby, Hobijn, Sahin, and Valletta 2011), instability trends over the 2007-2012 period are also reported. Over this period pre-tax and transfer instability rose 15 percent, and 7 percent after transfers were accounted for. For the full sample of families, descriptive evidence of sharply increased earnings instability from 2007 onward emerges, coinciding with the Great Recession and slow employment recovery of the late 2000s. Before taxes and transfers, instability growth during the 1981-1983, 1990-1992, 2001-2003, and 2007-2009 recessions is 8, 5, 5, and 9 percent, respectively. After safety net transfer programs are accounted for in the definition of family income, after-transfer instability growth during the 1981-1983, 1990-1992, 2001-2003, and 2007-2009 recessions is 14, 1, 5, and 3 percent, respectively. Not only were the early 1980s and late 2000s recessions the most severe with respect to unemployment (BLS 2012) – 10.8 percent in December 1982 and 9.5 percent in June 2009 – the growth rate of pre-tax and transfer income instability was the largest as well – ranging from 9 (2007-2009) to 15 (2007-2012) percent during the Great Recession and 8 percent

⁵ The NBER identified two recessions over the 1980-1982 time frame, but the annual design of the CPS data leads me to define this as a single recession from matched CPS year 1980-1981 to 1982-1983. The matched-CPS design is explained in the Data section.

from 1981-1983. The growth rate after including transfers is slower than before transfers during the early 1990s and late 2000s recessions, but faster for after-transfer income in the early 1980s and early 2000s recessions.

The remaining panels, 2-4, of Figure 2 provide a series of checks on the sensitivity of the instability estimates to the use of weights, as well as conditioning on year-over-year upward (panel 3) versus downward income changes (panel 4). Figure 2 shows that pre and after-tax and transfer income instability is robust to the use of person-level CPS weights. During the 1980s pre-tax and pre-transfer instability levels fall 19 percent after transfer programs are accounted for (0.55 to 0.44), 18 percent during the 1990s (0.60 to 0.49), and 13.5 percent from 2000-2006 (0.64 to 0.56), and 17 percent from 2007-2012. In terms of trend growth, pre-transfer instability rises 39 percent from 1980-2012 (versus 35 percent without weights), 21 percent from 1980 to 1999, 2 percent growth from 2000-2006 (versus 0.01 percent without weights), and then rises 9 percent to 0.68 throughout the 2007-2009 period (versus 0.66 without weights). 2007-2012 pre-tax and transfer instability growth is 16 percent, as compared to 15 percent without weights. Because the findings are not especially sensitive to and, if anything, are more conservative without the use of weights, results shown from this point forward are unweighted. The bottom panels 3-4 of Figure 2 isolate instability occurring from year-to-year income gains versus income losses. Particularly during the 2007-2009 recession and previous recessions, the *level* of volatility from positive income changes (panel 3) is at times 0.20 standard deviation points below that of the pooled volatility estimates (panel 1); this pre-tax and transfer definition of instability grows from 0 to 2 percent between the 1990-1992 and 2007-2009 recessions. The inquiry into income instability across demographic groups continues below, turning attention to heterogeneity across family structure and race.

a. Instability Across Family Structure and Race

Historically, poverty in United States has been higher among families headed by single parent females when compared to married couples, and higher also for blacks compared to whites. For example, in 1980 the poverty rate among female headed households was 36 percent and 32.5 percent among black families. By 2012, the female-headed household poverty rate fell a mere 3 percentage points to 33.2 percent, and black poverty fell 5 percentage points to 27.1. Compare these to overall U.S. poverty rates of 13 (1980) and 14.5 percent (2012) (DeNavas-Walt and Proctor 2014). In addition to relatively limited income resources at the mean, do female-headed and black families face greater exposure to income instability as well?

[Figure 3]

To begin answering this question, in Figure 3 I compare how married and single parent female headed families fare with respect to instability over the past 32 years (panels 1-2). I then turn attention to a comparison of instability between white and black families (panels 3-4). For married families, safety net transfer programs are associated with a 13 percent average income instability reduction throughout the 1980s (0.44 to 0.38) and a 14 percent reduction throughout the 1990s (0.48 to 0.41). From 2000-2006 transfers are associated with 13 percent lower instability (0.51 to 0.45) and 17 percent lower instability from 2007-2012 (0.55 to 0.45). Looking over recessions from 1981-1983, 1990-1992, 2001-2003, and 2007-2009, transfers are associated with progressively smaller instability reductions of 14, 13.7, and 12 percent. The exception to this pattern was a 15 percent reduction during the 2007-2009 recession. For married families, earnings instability rose 42 percent since 1980, including 15 percent during the early 1980s recession (1981-1983), 4 percent in the early 1990s, and 3 percent during the early 2000s recession, relative to a 7 percent increase during the 2007-2009 recession.

Instability levels for married families are low relative to those of single female headed families, ranging from 0.4 (1980) to 0.57 (2012), whereas single parent female-headed family instability spans 0.74 (1980) to 0.83 (2012). For female headed families, transfers are associated with instability reductions of 30 percent during the 1980s, 25 percent during the 1990s, 19 percent from 2000-2006, and 21 percent from 2007-2012. Across recessions, instability falls for this group by 32 (1981-1983), 26 (1990-1992), 20 (2001-2003), and 19 percent (2007-2009). With the exception of 1990-1992, the earnings instability growth rate is 2-3 percent within each recession. For married and single parent female heads, the Great Recession point-to-point instability growth rate is 12 percent once the slow employment growth period of 2010-2012 is included.

Turning attention to black-white comparisons of instability, panels 3-4 of Figure 3 compare instability before and after taxes and transfers for white and black families. For white families, transfers lower instability by 15, 16, 14, and 17 percent over the 1980s, 1990s, 2000-2006, and 2007-2012 respectively. After-transfer instability reduction during recessions follows the same pattern—16 percent lower in 1981-1983 and 1990-1992, and roughly 14 percent lower from 2001-2003 and 2007-2009. White family trend instability rises 46 percent over the entire period, including 12 percent during the early 1980s recession, 27 percent from 1980-1999, and 8 percent during the Great Recession – up to 18 percent once 2010-2012 are added to the period. For black families, instability *levels* are on par with those of single-parent female heads, but devoid of any trend, ranging from 0.81 (1980) to 0.80 (2012). Average black family after-transfer instability is 32, 25, 18, and 19 percent lower after accounting for transfer programs over the 1980s, 1990s, 2000-2006, and 2007-2012 respectively. Similar to female-headed families, the safety net is descriptively less responsive over time for black families, and this pattern is

maintained over the 1981-1983, 1990-1992, 2001-2003 recessions with reductions of 35, 25, and 16 percent after transfers, respectively. During the 2007-2009 recession, the after transfer descriptive “reduction” rises to 20 percent. Among whites, there is less evidence of a decline in safety-net buffering over time, as the pre-post instability percent difference of averages holds at 16 percent from 1981-1983 through 1990-1992, falling to roughly 14 percent for recessions in the 2000s. The 2007-2009 recession instability growth rate falls to 2 and 3 percent for black and white families, respectively, after accounting for transfer programs. That average black and female-headed family after-transfer income instability is roughly equivalent to that of pre-tax and transfer white instability further illuminates differences with respect to income dynamics across race and family structure, perhaps reflecting in part the income dynamics of the poor, who are over-represented among black and female-headed families. The declining trend in instability buffering among black and female-headed families raises concerns relating to group differences in safety net participation and effectiveness (Boadway, Cuff, and Marceau 2008; Fording, Soss, and Schram 2011). For families headed by women and blacks, income is not only lower but more volatile.

b. Instability Across The Income Distribution

[Figure 4]

Like previous recessions, the 2007-2009 Great Recession was felt disproportionately among lesser-educated, lower and moderate income households (OECD 2009). Accordingly, it is important to examine whether incomes were more or less unstable during this and other time periods, and how safety net programs did or did not respond to labor market risk for low versus higher income families. Also, we can begin to consider whether cross-race and family structure

differences in instability are explained in part by position within the income distribution. Figure 4 depicts instability trends across quintiles of the income distribution, starting from the bottom 20 percent. Among this poorest group of the sample, where average real disposable family incomes (2010 dollars) are approximately \$19,000, safety net transfers are associated with substantial instability reductions—reductions that fall in magnitude over time (Figure 4). Instability is 26 and 23 percent lower after transfers are accounted for throughout the 1980s and 1990s respectively, and 18 percent lower from 2000-2006 and 2007-2012. The safety net transfer percent “difference” in 1981-1983 is 27 percent, 24 percent from 1990-1992, 18.5 percent from 2001-2003, and 17 percent from 2007-2009. Instability exhibits 21 percent trend growth before taxes and transfers between 1980 and 2012, from 0.90 (1980) to 1.09 (2012); instability within the lowest income quintile is the highest of any subgroup throughout the analysis. Compared to pre-transfer income, after-transfer instability growth over the 1990-1992 and 2007-2009 recessions is slower, 0.2 percent from 7 percent (early 1990s) and 1.6 percent from 7 percent (2007-2009 recession), respectively. That poor families exhibit the highest instability across the income distribution also finds support in a recent study by Morris et al. (2014), which estimates the coefficient of variation with data from the SIPP.

Like the bottom 20 percent, including transfer and tax programs consistently results in lower income instability levels among families between percentiles 20 and 40. With relatively lower-to-moderate average disposable incomes of \$31,000, families within this range of income would still qualify for programs such as the EITC (Nichols and Rothstein 2015) and SNAP (Hoynes and Schanzenbach 2015). The pattern of a diminished “level” reduction since 1980, observed for female headed families, black families, and the bottom income quintile disappears for the 20-40 percentile group. Looking across decades, transfers are associated with instability

reductions of 18 and 19 percent throughout the 1980s and 1990s, respectively. For 2000-2006 there is an 18 percent reduction, which then rises to 24 percent during the 2007-2009 recession. Across recessions, the average percent reduction in pre versus after-transfer instability levels ranges from 19.5 percent in the 1981-1983 recession, falls to 17 and 18 percent in 1990-1992 and 2001-2003, but then rises to 22 percent from 2007-2009. Overall, pre-transfer instability rises 42 percent between 1980 and 2012, from 0.52 to 0.68. The growth rate of instability after-transfers are accounted for falls by 10 percent (1990-1992), 179 percent (2001-2003), and 67 percent (2007-2009).

To understand the target efficiency of safety net transfer programs, middle and upper family income instability is also examined throughout panels 3-5, looking at income percentiles 40-60, 60-80, and the top 20 percent. Perhaps as expected, relative to lower and moderate income families, families within percentiles 40 to 60 with average disposable income of \$42,300 exhibit smaller percent-reductions in instability levels after transfers than lower income groups. However, this masks noteworthy reversals, especially during the Great Recession. Safety net transfers for this group are associated with *larger* after-transfer instability reductions over time – a reversal of the pattern observed among the bottom 20 percent, female-headed families, and black families. Instability is 10 (1981-1983), 11 (1990-1992), 12 (2001-2003), and 15 percent (2007-2009) percent lower over time after transfers. This descriptive after-transfer relationship is notable given that, since 1980, *pre-transfer* instability rose 58 percent (0.34 to 0.54), including 40 percent from 1980-1999, 8 percent from 2000-2006, 25 percent from 2007-2009, and 19 percent from 2007-2012.

Families in income percentiles 60-80 operate with average real pre-tax income of \$70,000 and disposable income of \$54,000. *Taxes* begin to take precedence moving up the

income distribution looking across three decades and four recessions. The after-transfer instability reduction is 6 percent during the 1980s—but 20 percent after taxes and transfers; roughly 9 percent after transfers and 24 percent after taxes and transfers during the 1990s; and, from 2000-2006 8 percent after transfers and 23 percent after taxes and transfers. Transfers reduce instability by 12 percent during the 2007-2009 recession, whereas taxes and transfers reduce instability by 28 percent. Across recessions, the after-tax and transfer instability reduction rises from 18 percent (1981-1983) to 21 percent (2007-2009), compared to a 7 to 11 percent reduction when accounting for transfers alone. Families within the top 20 percent of the income distribution, where pre-tax mean income is \$92,000 on average, descriptively yield most of their instability level reductions from the tax system. 1980-2012 instability rises 47 percent, from 0.29 to 0.42, but safety net transfers are associated with lower average recessionary levels of instability by 5 to 7 percent comparing 1981-1983 and 2007-2009, respectively, compared to after-tax and transfer percent reductions of 19 to 17 percent across the 1981-1983 and 2007-2009 recessions.

Figure 4 and Table 4 describe a safety net reducing income instability the most for families that are poor, female-headed, or headed by a black adult. However, these same groups experience less of an instability-reduction over time since 1980. The opposite is true for families between the 20th and 60th percentile of the income distribution. This may be explained by policy reforms to the safety net including Welfare Reform in 1996 and the diminished role of cash assistance along with expansions to the EITC, which collectively shifted resources away from the jobless poor towards workers at or near poverty (Ben-Shalom et al. 2012; Hardy et al. 2015; Moffitt 2014; Ziliak 2011).

c. Instability Across Education

[Table 4] [Figure 5]

Incomes are typically most unstable among lower-income and less educated individuals and household heads, who may experience higher rates of labor market instability and job loss. Several studies (Autor, Katz, and Kearney 2008; Piketty and Saez 2003) document rising inequality since the 1980s and a dispersion in wages connected to differences in returns to education. Since 1980, higher skilled workers have made larger wage gains, and the “last-in first-out” theory of employment (Borjas 2010; Feldstein 1976) holds that these workers, possessing advantages in both education and experience, will enjoy greater employment stability. Differences in observed instability levels and trends might be expected, consistent with varying labor market experiences based on skill differences reflecting short-term economic conditions as well as longer-term structural change (Keys 2008; Ziliak et al. 2011). Beginning with panel 1 in Figure 5, transfers are associated with 27 percent (1980s), 26 percent (1990s), 20 percent (2000-2006), and 20.5 percent (2007-2012) instability reductions. Likewise, across recessions there is a declining effect of safety net transfer programs of 28, 27, 20, and 19 percent over the 1981-1983, 1990-1992, 2001-2003, and 2007-2009 recessions respectively. The trend in family income instability among household heads without a high school diploma rises 22 percent since 1980, from 0.69 to 0.84. The 1990-1992 instability growth rate is 157 percent lower after transfers are accounted for, but otherwise the safety net is not linked with any flattening of instability growth over the 32 year period.

Family income instability among household heads with a high school diploma is similar to the experience of families in the 20-40 income percentile group, with instability reduction after transfers of 16 to 18 percent over the entire period. The instability reduction associated with safety net transfers across recessions falls from 20 to 15 percent between 1981-1983 and the

2000s. Family heads with at least some college training experience instability during recessions; since 1980 the safety net accounts for larger average after-transfer instability reductions across recessions for families headed by an adult with at least some college. These reductions span 9 percent over the 1980s, 12 percent over the 1990s and from 2000-2006, and 16 percent from 2007-2012. Over recessions, transfers lower instability by 9 percent (1981-1983), 11 percent (1990-1992), 12 percent (2001-2003), and 13 (2007-2009); pre-transfer instability rises 50 percent for this group from 1980-2012. Descriptively, the safety net appears *more* responsive over time for workers with moderate income and education beyond high school. Higher educated families have relatively lower levels of income instability, both before and after taxes and transfers are accounted for, between and during recessions. This is consistent with studies showing that college educated workers were better insulated from economic shocks and job loss than those with less education during the Great Recession years (Grusky et al. 2012).

5. Income Instability and Taxes

Although taxes are not the focal point of the analysis, the income instability estimates include state and federal tax liabilities. As evident in Figures 2-5, the tax system acts as an automatic stabilizer throughout the 32-year period studied for all groups, but with varying intensity. Taxes play a relatively small income-smoothing role among economically disadvantaged groups, such as female heads, families in the bottom 40 percent of the income distribution, those with less education, or black families—refundable tax credits notwithstanding. Figure 4 and Table 4 show that transfers account for a relatively smaller instability reduction among family heads in the top 20 percent of disposable incomes, whereas the reduction in after-tax *and* transfer income instability levels is far larger. For example, among married family heads (Figure 3 Panel 1), accounting for taxes *with* transfers relates to an average 23 percent lower income instability from

1980-2012, compared to 14 percent after transfers alone. By comparison, for single parent female heads (Figure 3 Panel 2), there is a relatively small 4 percentage point difference in the after-transfer versus after-tax and transfer income instability reduction, a 24 versus 28 percent lower instability level, respectively. The evidence here supports previous research (Blundell, Pistaferri, and Preston 2008; Hardy and Ziliak 2014; Kniesner and Ziliak 2002) indicating that tax and transfer programs provide insurance against income shocks, but this combination tilts in the direction of transfer programs for low and moderate-income families and taxes for higher income families.

6. Discussion and Policy Implications

Program-specific income instability trends will not add up to the total safety net instability trend reported here, as neither variances nor their transformations are additive. For example, a particular program may exhibit a relatively modest direct reduction in income instability because multiple programs act concurrently while responding to earnings shocks. Such relationships are captured by covariances between different sources of family income, and recent evidence by Hardy and Ziliak (2014) suggests a negative and rising covariance between earnings instability and both transfer income and tax instability towards the latter part of the 2000s – indicative of a responsive safety net. Their study suggests the covarying relationship to be stronger among socioeconomic groups that demonstrate the greatest need, for example female-headed households and those at the lower end of the income distribution. Likewise, the largest after transfer and tax reductions in instability occur here among the most economically disadvantaged groups.

[Table 5]

Throughout the study, comparisons of pre and post-transfer instability are made to describe income variances and the safety net's impact over time. To better assess this, Table 5 estimates a regression of income instability over time, to determine whether instability before and after transfers differs statistically across recessions and expansions between 1980 and 2012. Holding two-year mean income constant, and with 1981-1983 as the omitted time period, post-tax and transfer instability is statistically different across all recessions and expansions (column 2), and the magnitude of this difference generally rises over time. Growth during the 1980s is modest, such that post-transfer instability is 0.02 higher in 1984-1989 than 1981-1983 – small relative to the differences in evidence later in the period. Pre-tax and transfer instability throughout the 1980s is not statistically different between recessions or expansions (column 1). The results are not sensitive to the inclusion of AFDC/TANF and SSI (column 3), SNAP (column 4), or the EITC (column 5).

The percent-reductions at the beginning of the sample period, shown in Table 4 and Figures 2-5, may be conservative given that Unemployment Insurance data is unavailable from 1980-1986 in the CPS. Another point regarding the interpretation of after-transfer trends and levels involves the timing of EITC payments. While treated equivalently to the other sources of transfer income, payments are not distributed by the Internal Revenue Service until early in the next calendar year, between January and April. Historically, participants could receive refund anticipation loans or participate in the Advance EITC program – which allowed the EITC to be received throughout the year as a portion of the filer's paycheck (Nichols and Rothstein 2015; Tach and Halpern-Meekin 2014). That program was discontinued in 2011, and the results may therefore overstate the safety net's impact on point-in-time instability – to the degree that EITC payments are received as a lump-sum payment. Across the income distribution, it is also

important to recall that the sample is representative of 95 percent of the distribution – the top 5 percent are dropped to address changing topcoding methodologies that transitioned to an income-swapping procedure for the top of the distribution in 2011 (Larrimore, et al. 2008; U.S. Census 2013). Finally, Medicare and Medicaid benefits are excluded from the analysis, which potentially understates the collective role of the safety net. However, a challenge with incorporating the market value of medical insurance surrounds the illiquid nature of these benefits—realized in the instance of a health event or shock.

The standard deviation-based measure of instability summarizes temporary circumstances as well as larger changes in the structure of the economy, and the trends potentially reflect structural change in the economy (Autor, Katz, and Kearney 2008) and changes in public policy since the 1980s (Ben-Shalom et al. 2012; Currie 2006; Fording et al. 2011; Moffitt 2014; Waldfogel and Smeeding 2010). Higher levels of instability at the low end of the income distribution reflect the variation of income percent changes across different income groups. To further describe this dispersion, I calculate family income percent changes before and after transfers across the 5 income groups discussed in Figure 4. Here, I highlight the within-group income percent change at the 10th and 90th percentiles *within* each of the 5 income groups. For the bottom 20 percent of the income distribution (Figure 4 Panel 1), income percent changes range from -106 percent (pre-tax and transfer) to -54 percent (after transfers) for the 10th percentile, and 170 (pre-tax and transfer) to 121 percent (after transfers) at the 90th percentile, respectively. By comparison, families between income percentiles 40 and 60 (Figure 4 Panel 3) experience pre-tax and transfer income percent changes from -50 percent (pre-tax and transfer) to -43 percent (after transfers) for the 10th percentile of this group, and 42 (pre-tax and transfer) to 39 percent (after transfers) at the 90th percentile of percent changes, respectively. Assessing

this within the top 20 percent of the income distribution (Figure 4 Panel 5), pre-tax and transfer income percent changes range from roughly -60 for the 10th percentile both before and after transfers to about 16 percent before and after transfers at the 90th percentile.

The safety net as a whole – inclusive of food stamps, cash transfers, and the EITC – exhibits a reduced income-smoothing benefit over time among female-headed families, black families, and those in the bottom income quintile. This same population experienced significant reductions in poverty during the economic boom of the 1990s following welfare reform, due to a combination of tight labor market conditions and expanded access to the EITC and SNAP (Gundersen and Ziliak 2004). This was not sustained, and recent evidence suggests welfare reform from AFDC to TANF may have rendered some jobless workers “disconnected” from social assistance, so that today’s safety net is less responsive for some than in the past to recessions and adverse economic circumstances (Ben-Shalom et al. 2012; Bitler and Hoynes 2014; Moffitt 2014). Meanwhile, the working poor and near-poor have benefitted from federal expansions to the EITC and SNAP throughout the 1980s, 1990s and the 2009 ARRA, as well as outreach efforts to boost participation in these programs (Hardy, Smeeding, and Ziliak 2015).

7. Conclusion

Using 1980-2012 as a reference period, I examine income instability in America with an emphasis on the 1980s, 1990s, 2000s and recessions occurring in 1981-1983, 1990-1992, 2001-2003, and 2007-2009. I evaluate the net-accounting impact of safety net programs by estimating income instability before and after adding safety net transfer programs and taxes to an earnings-based definition of income. Using matched data from the CPS, I find lowered instability after accounting for transfer programs including TANF, Unemployment Insurance, SNAP, and the

EITC. The tax system only strengthens the size of this association, though primarily for upper income households. The level of instability is highest, and the reduction after transfers is largest, among low income, black, female-headed, and lesser-educated families, respectively. I also find rising pre-tax and transfer income instability since 1980, and a 15 percent increase since 2007. The finding of an income instability trend increase may be sensitive to the choice of data set and should therefore be interpreted cautiously; instability studies using administrative data tend to find less, if any, evidence of trend growth since the 1980s (Dahl et al. 2011; Winship 2009).

These findings are consistent with recent work by Bitler, Kuka, and Hoynes (2014), and Larrimore, Burkhauser, and Armour (2014) providing evidence that safety net transfer programs buffer against negative economic shocks, though perhaps to a lesser degree over time. Programs bolstered by the ARRA provided state fiscal relief, additional tax cuts, and additional funds for programs such as Unemployment Insurance, federal EITC's, and SNAP (CBO 2012). Interestingly, this short-term fiscal policy action during the 2007-2009 Great Recession masks reduced insurance from earnings instability over the past 30 years for female-headed families, black families, and those in the bottom income quintile. This has serious policy implications, and is similar to findings by Bitler and Hoynes (2014) suggesting that the most economically disadvantaged families are protected less by the safety net over time. For these families, the safety net has generally become *less* responsive to relative to rising earnings instability since 1980. This may be indicative of policy changes leading to reduced participation in cash assistance, structural change in the labor market driving joblessness within these subgroups, or possibly some combination of the two.

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Figure 1. Real Spending on Selected Safety Net Programs

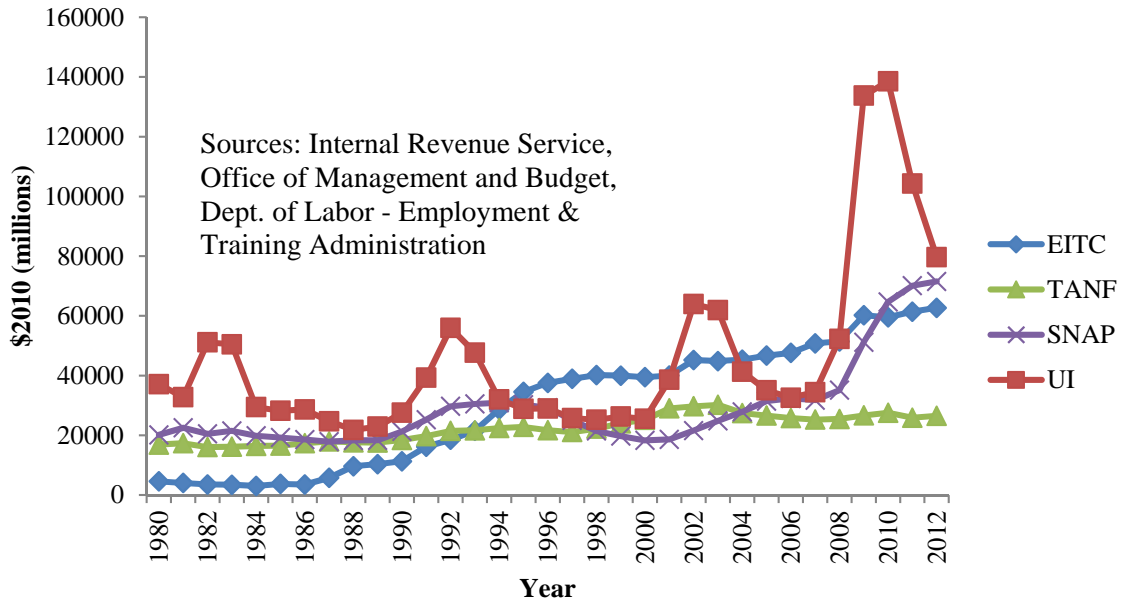


Figure 2. Income Instability, Safety Net Transfers, and Taxes

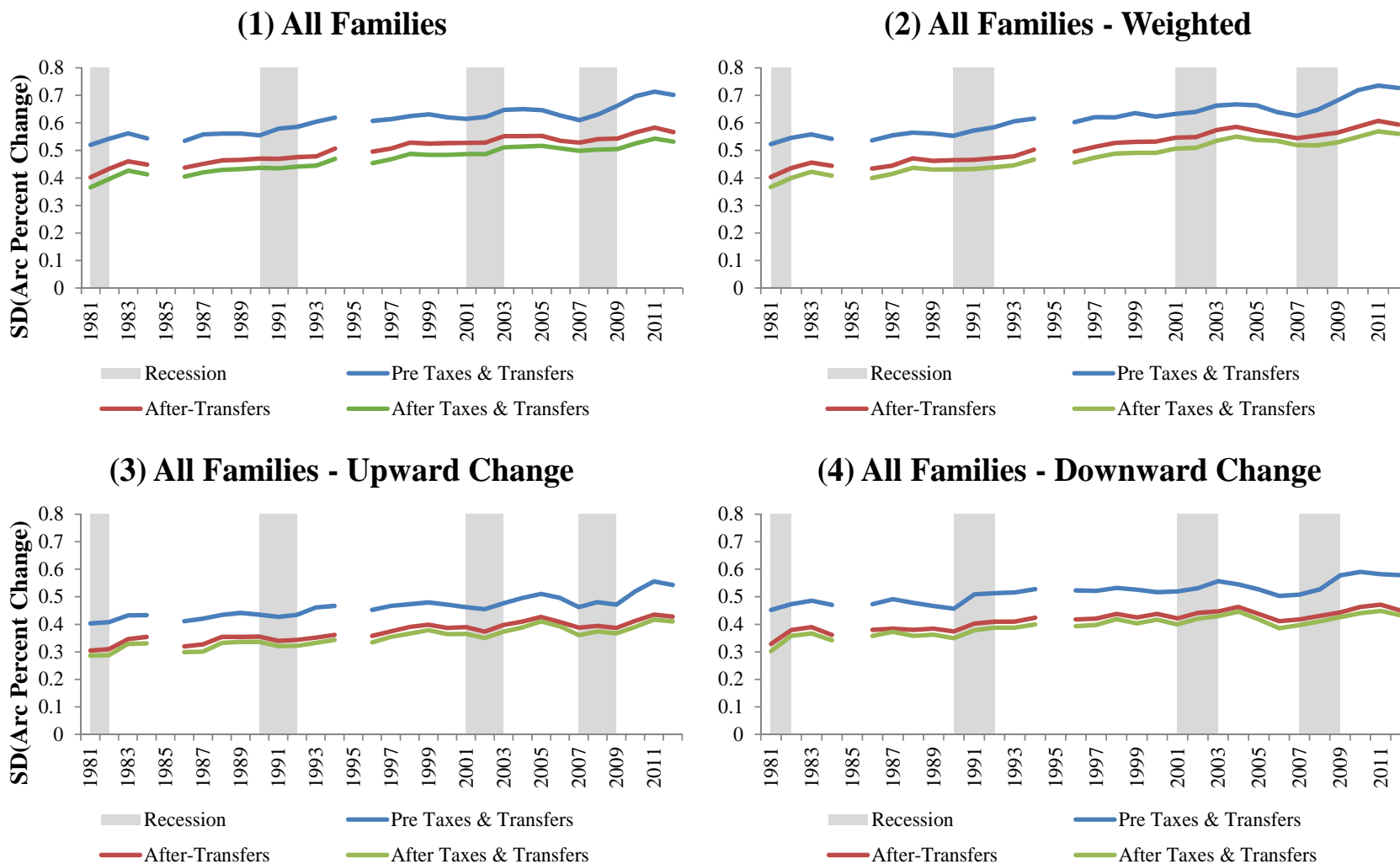


Figure 3. Income Instability and Safety Net Transfers across Family Structure and Race

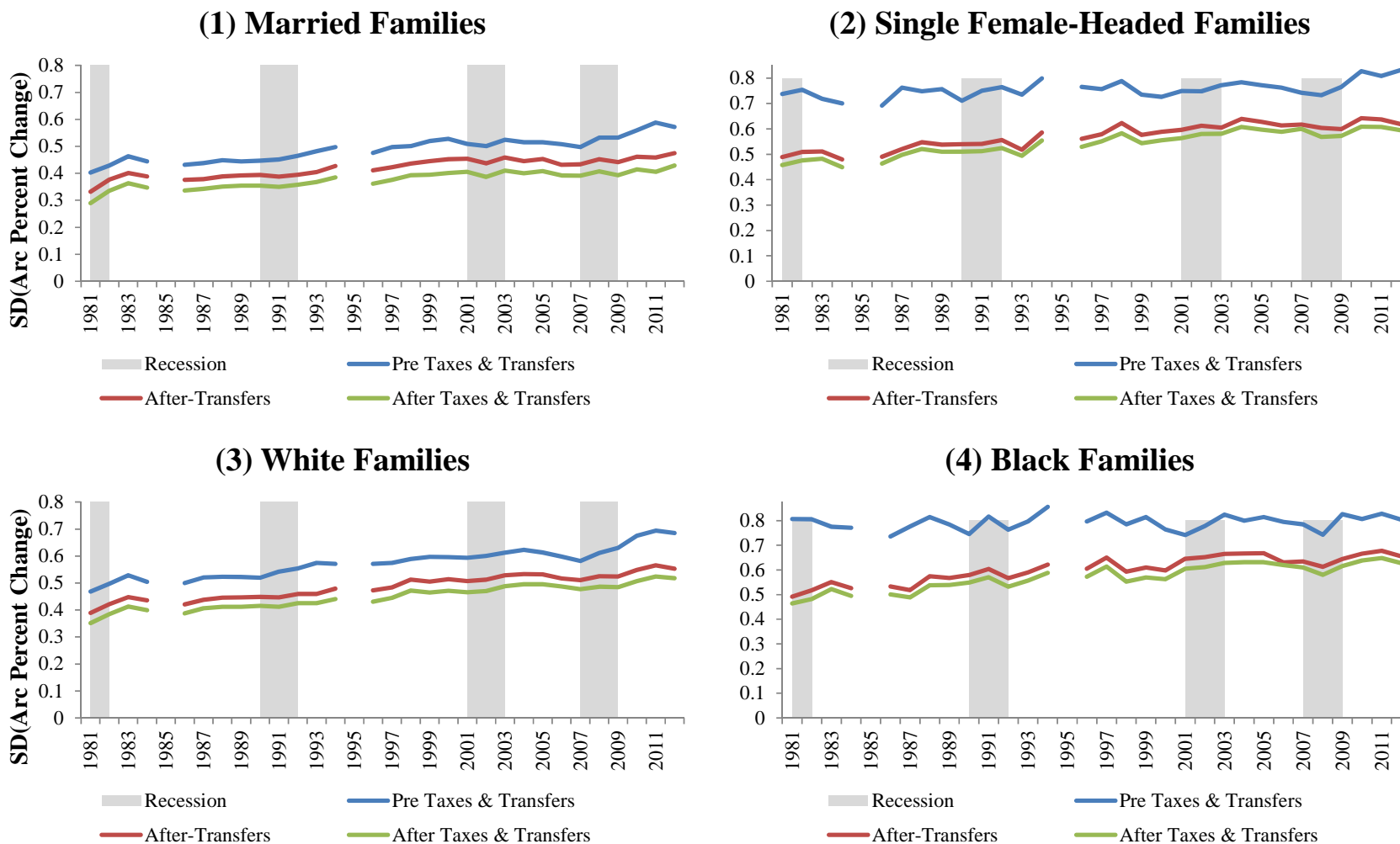


Figure 4. Income Instability and Safety Net Transfers across the Income Distribution

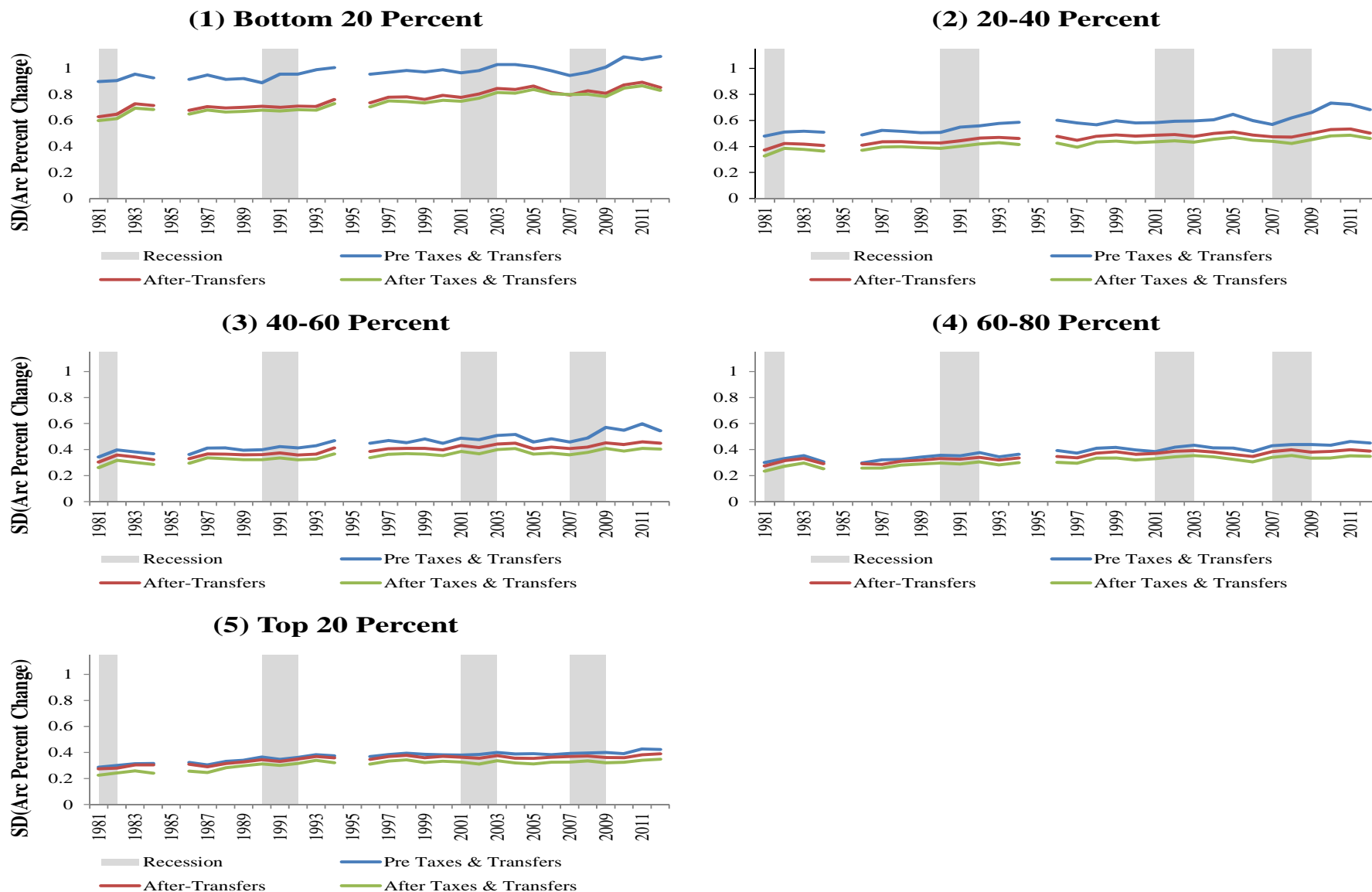


Figure 5. Income Instability and Safety Net Transfers across Education

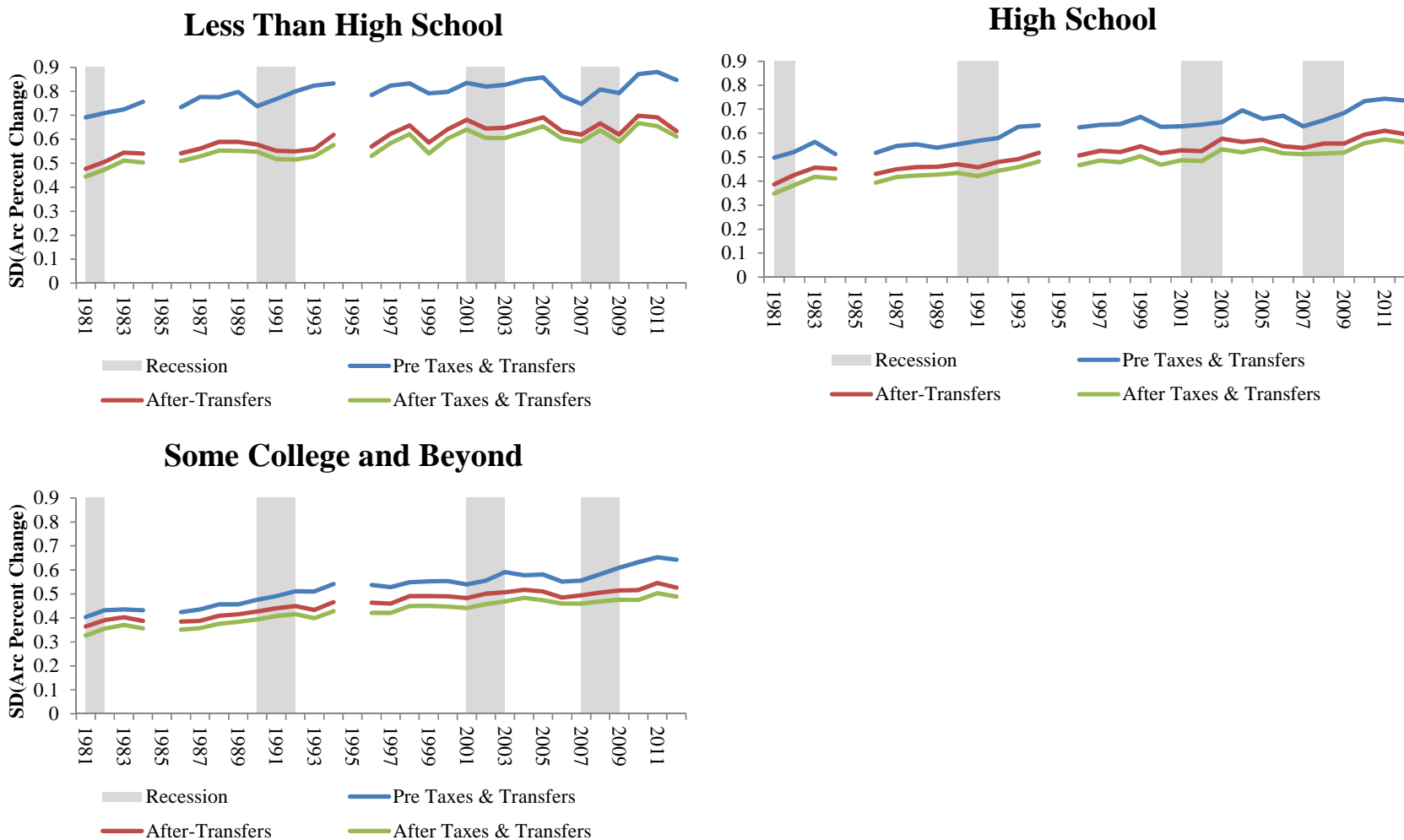


Table 1. OLS Regression of Pre-Tax and Transfer Instability and Unemployment

Instability	All Families	White Families	Black Families	Some College	H.S. or Less	Bottom 40%	Top 40%
Unemployment	0.013*** (0.003)	0.014*** (0.004)	0.004 (0.004)	0.014** (0.005)	0.013** (0.006)	0.020*** (0.007)	0.004 (0.002)
Mean Income	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Constant	-0.209** (0.097)	-0.365*** (0.114)	0.731*** (0.073)	-0.737*** (0.179)	-0.268 (0.221)	-0.108 (0.264)	-0.172*** (0.059)
Observations	30	30	30	30	30	30	30
R-squared	0.7348	0.7304	0.0419	0.6682	0.4171	0.3101	0.8046

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Variables: *Unemployment* represents state-level unemployment rate and *Mean Income* represents mean 2-year disposable income. *Instability* represents pre-tax and pre-transfer 2 year standard deviation of the arc percent change.

Table 2. Number and Rate of Merges by 2nd Year of CPS. CY 1981-2012

Year	# Merged CPS Observations	# CPS Observations	Merge Rate
1981	7,637	13,346	57.2%
1982	8,278	13,795	60.0%
1983	8,273	13,843	59.8%
1984	7,691	13,721	56.1%
1985			
1986	7,920	13,880	57.1%
1987	8,590	16,224	52.9%
1988	9,295	15,316	60.7%
1989	9,444	16,606	56.9%
1990	10,111	16,752	60.4%
1991	10,100	16,516	61.2%
1992	10,020	16,284	61.5%
1993	7,250	14,768	49.1%
1994	6,307	15,142	41.7%
1995			
1996	7,688	12,864	59.8%
1997	7,491	12,529	59.8%
1998	7,073	12,172	58.1%
1999	6,649	12,333	53.9%
2000	6,198	17,276	35.9%
2001	7,514	17,614	42.7%
2002	7,485	18,032	41.5%
2003	7,713	17,720	43.5%
2004	6,567	17,767	37.0%
2005	7,112	17,532	40.6%
2006	7,304	13,743	53.1%
2007	7,480	13,626	54.9%
2008	7,589	13,977	54.3%
2009	7,829	13,856	56.5%
2010	7,525	13,408	56.1%
2011	7,513	13,464	55.8%
2012	7,375	13,225	55.8%
Average # of Matches	7,834	Average % Matched	53.1%

Notes: Sample is restricted to household heads between ages 25 and 60 that have non-negative pre-tax & pre-transfer income, without imputed income, and excluding the top 5 percent of income over each annual sample to exclude topcodes.

Table 3. Summary Statistics by 2nd Year, 1981-2012

Variables	Main Sample-Not Weighted		Weighted Sample	
	Mean	Standard Deviation	Mean	Standard Deviation
Main Income Variables				
Pre-Tax & Transfer Income (\$)	51,923.72	33,018.65	51,790.53	33,176.54
Income with Transfers (\$)	54,146.3	31,600.04	54,002.8	31,784.73
Income with Transfers & Taxes (\$)	42,661.39	22,573.79	42,330.95	22,645.59
Transfer Program Income				
Transfer Income (\$)	2,222.58	4,980.50	2,212.28	5,013.99
SNAP/Food Stamps (\$)	160.79	689.70	148.28	655.45
TANF/AFDC (\$)	122.27	821.82	117.59	789.95
Unemployment Insurance (\$)	276.10	1,333.83	338.07	1,340.02
2007-2010 Transfer Program Income				
Transfer Income (\$)	3,101.38	6,144.90	3,126.89	6,255.70
SNAP/Food Stamps (\$)	261.23	1,028.79	229.00	950.28
TANF/AFDC (\$)	52.27	558.69	43.00	508.30
Unemployment Insurance (\$)	635.02	2,618.25	676.92	2,704.78
Demographics				
Age	42.68	9.54	42.94	9.66
% Female	36.76	46.97	37.03	47.16
No. of Persons in Family	2.86	1.50	2.73	1.47
% Less Than High School	14.11	34.36	13.74	33.93
% High School	34.42	47.37	34.45	47.39
% More Than High School	51.47	49.45	51.80	49.42
% White	84.86	35.77	84.75	35.91
% Black	10.57	30.73	11.55	31.88
% Other	4.57	20.57	3.70	18.66
% Married	61.11	48.47	58.88	48.79

Notes: Income data are adjusted for inflation using the 2009 personal consumption expenditure deflator. Transfer income categories are conditional means on receipt of one or more social program transfers in year 1 or year 2. Sample is restricted to household heads between ages 25 and 60 that have non-negative pre-tax & pre-transfer income, and excludes heads with imputed income as well the top 5 percent of income over each annual sample.

Table 4. Pre and Post Transfer Income Instability across Demographic Characteristics, 1981-2012

Year	All			Married			Female Heads			Whites			Blacks		
	Pre	Post	%Δ	Pre	Post	%Δ	Pre	Post	%Δ	Pre	Post	%Δ	Pre	Post	%Δ
1981	0.52	0.40	-23	0.40	0.33	-17	0.74	0.49	-34	0.47	0.39	-17	0.81	0.49	-39
1982	0.54	0.43	-20	0.43	0.38	-12	0.75	0.51	-32	0.50	0.42	-15	0.81	0.52	-36
1983	0.56	0.46	-18	0.46	0.40	-13	0.72	0.51	-29	0.53	0.45	-15	0.77	0.55	-29
1990	0.56	0.47	-15	0.45	0.39	-12	0.71	0.54	-24	0.52	0.45	-14	0.75	0.58	-22
1991	0.58	0.47	-19	0.45	0.39	-14	0.75	0.54	-28	0.54	0.45	-17	0.82	0.60	-26
1992	0.59	0.48	-19	0.47	0.39	-15	0.76	0.56	-27	0.55	0.46	-17	0.76	0.57	-26
2001	0.61	0.53	-14	0.51	0.45	-11	0.75	0.60	-20	0.59	0.51	-14	0.74	0.65	-13
2002	0.62	0.53	-15	0.50	0.44	-13	0.75	0.61	-18	0.60	0.51	-15	0.78	0.65	-16
2003	0.65	0.55	-15	0.52	0.46	-13	0.77	0.60	-22	0.61	0.53	-14	0.82	0.67	-19
2007	0.61	0.53	-13	0.50	0.43	-13	0.74	0.62	-17	0.58	0.51	-12	0.79	0.63	-19
2008	0.63	0.54	-14	0.53	0.45	-15	0.73	0.60	-18	0.61	0.52	-14	0.74	0.61	-18
2009	0.66	0.54	-18	0.53	0.44	-17	0.77	0.60	-22	0.63	0.52	-17	0.83	0.64	-22
2012	0.70	0.57	-19	0.57	0.48	-17	0.83	0.62	-26	0.68	0.55	-19	0.80	0.66	-18

Table 4 (Continued). Pre and Post Transfer Income Instability across Demographic Characteristics, 1981-2012

Year	All			Income Distribution									Education								
	Pre	Post	%Δ	0-20			20-40			40-60			Top 20			College			H.S.		
	Pre	Post	%Δ	Pre	Post	%Δ	Pre	Post	%Δ	Pre	Post	%Δ	Pre	Post	%Δ	Pre	Post	%Δ	Pre	Post	%Δ
1981	0.52	0.40	-23	0.90	0.40	-30	0.48	0.37	-22	0.34	0.30	-11	0.29	0.27	-5	0.40	0.36	-10	0.50	0.39	-31
1982	0.54	0.43	-20	0.91	0.43	-28	0.51	0.42	-17	0.40	0.36	-10	0.30	0.28	-7	0.43	0.39	-10	0.52	0.43	-29
1983	0.56	0.46	-18	0.96	0.44	-24	0.52	0.42	-19	0.38	0.34	-10	0.31	0.30	-3	0.44	0.40	-7	0.56	0.46	-25
1990	0.56	0.47	-15	0.89	0.48	-20	0.51	0.43	-16	0.40	0.36	-10	0.37	0.34	-6	0.48	0.43	-10	0.55	0.47	-22
1991	0.58	0.47	-19	0.96	0.49	-27	0.55	0.44	-19	0.42	0.37	-11	0.35	0.33	-4	0.49	0.44	-10	0.57	0.46	-28
1992	0.59	0.48	-19	0.96	0.51	-26	0.56	0.46	-17	0.41	0.36	-13	0.36	0.35	-4	0.51	0.45	-12	0.58	0.48	-31
2001	0.61	0.53	-14	0.97	0.54	-20	0.58	0.49	-17	0.49	0.43	-12	0.38	0.36	-5	0.54	0.48	-11	0.63	0.53	-18
2002	0.62	0.53	-15	0.98	0.56	-18	0.59	0.49	-17	0.48	0.42	-13	0.39	0.36	-8	0.56	0.50	-10	0.64	0.52	-21
2003	0.65	0.55	-15	1.03	0.59	-18	0.60	0.48	-20	0.51	0.44	-13	0.40	0.38	-6	0.59	0.51	-14	0.65	0.58	-22
2007	0.61	0.53	-13	0.95	0.56	-16	0.57	0.48	-17	0.46	0.41	-11	0.39	0.37	-6	0.56	0.49	-11	0.63	0.54	-17
2008	0.63	0.54	-14	0.97	0.58	-15	0.62	0.47	-24	0.49	0.42	-14	0.40	0.37	-6	0.58	0.51	-13	0.65	0.56	-18
2009	0.66	0.54	-18	1.01	0.61	-20	0.66	0.50	-24	0.57	0.45	-21	0.40	0.36	-10	0.61	0.51	-16	0.68	0.56	-22
2012	0.70	0.57	-19	1.09	0.64	-22	0.68	0.50	-26	0.54	0.45	-18	0.42	0.39	-8	0.64	0.53	-18	0.74	0.60	-25

Table 5. Instability over the Business Cycle, 1981-2012

	Pre Tax & Transfer	Post Tax & Transfer	Pre Tax & Transfer w/ Cash	Pre Tax & Transfer w/ Food	Pre Tax & Transfer w/ EITC
1984-1989 (E)	0.010 (0.011)	0.023** (0.011)	0.022* (0.012)	0.023* (0.014)	0.010 (0.011)
1990-1992 (R)	0.031** (0.012)	0.041*** (0.012)	0.053*** (0.014)	0.046*** (0.015)	0.030** (0.012)
1993-2000 (E)	0.076*** (0.010)	0.074*** (0.010)	0.094*** (0.011)	0.097*** (0.013)	0.070*** (0.010)
2001-2003 (R)	0.086*** (0.012)	0.098*** (0.012)	0.119*** (0.014)	0.125*** (0.015)	0.079*** (0.012)
2004-2006 (E)	0.099*** (0.012)	0.116*** (0.012)	0.130*** (0.014)	0.134*** (0.015)	0.092*** (0.012)
2007-2009 (R)	0.093*** (0.012)	0.106*** (0.012)	0.129*** (0.014)	0.137*** (0.015)	0.086*** (0.012)
2010-2012 (E)	0.163*** (0.012)	0.137*** (0.012)	0.198*** (0.014)	0.195*** (0.015)	0.155*** (0.012)
Constant	0.542*** (0.009)	0.397*** (0.008)	0.455*** (0.010)	0.488*** (0.011)	0.540*** (0.008)
Observations	30	30	30	30	30
R-squared	0.9330	0.9223	0.9418	0.9304	0.9280

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Omitted time period is the 1981-1983 recession. (E) denotes expansionary period, and (R) denotes recession, as defined by the National Bureau of Economic Research. <http://www.nber.org/cycles.html>

Appendix Figure 1. Income Instability with Flexible Head of Household Status

