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Changes in the Volatility of Household Income in the United States: A Regional Analysis

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Findings

An analysis of six two-year panels of American households, constructed from the Current Population Survey's Annual Social and Economic Supplements from the 1980s, 1990s, and 2000s, reveals that:

- The typical American household experienced significantly larger annual changes in per capita income in the years 1992-1994 than they did in 1985-1987, and income volatility rose again by a small margin in the period 2003-2005. All three periods had similar GDP growth rates, suggesting that this is a long-run trend, not merely a cyclical phenomenon.
- Income volatility has a strong geographic component, with some states displaying higher-than-average volatility in most years, and others being persistently on the low end of the scale. The low-volatility states were Maine, Rhode Island, Pennsylvania, Ohio, Wisconsin, Minnesota, Missouri, Nebraska, and Maryland. The high-volatility states were New York, Georgia, Florida, Texas, New Mexico, Arizona, and California. The secular increase in income volatility, however, was distributed across all regions, and no state experienced a statistically significant decline over time.
- This trend was characterized by an increased frequency of both large upward and large downward changes in household income per person, but these increases were not entirely symmetrical. In the 1980s, households experiencing per capita income gains of 50 percent or more outnumbered those with income losses of comparable proportionate size by a ratio of 2.5 to 1. By 2003-2005, however, that ratio had fallen to 1.8 to 1.

- The net effect of the increased flux of income in both directions was arguably beneficial for those in the bottom quintile, as they experienced a net increase in short-term upward mobility of 6.4 percentage points, measured at the median, in 2003-05 as compared to the 1980s, meaning that a larger share of low-income households saw their incomes rise. All other quintiles, however, experienced less net upward mobility, by two to four percentage points, in 2003-2005 as compared to the 1980s.
- A regression analysis of the determinants of income volatility at the state level reveals that states with higher shares of employment in agriculture, wholesale and retail trade, and other services, as compared to manufacturing, and those with lower union coverage rates, experienced greater volatility. No support is found for the hypothesis that the secular increase in the volatility of per capita household income is due to an increase in female labor force participation, and, indeed, there is evidence that states with a higher share of women in full-time full-year employment, as compared to being non-workers, had lower subsequent income volatility.

Introduction

Recent years have witnessed a growing concern that middle-class American households might now face more economic risk, or volatility of income, than they did twenty or twenty-five years ago, despite the fact that the macro economy has been more stable over this period than in the past. These societal worries have been fueled by developments such as the contraction of the manufacturing sector, which has traditionally been an important source of secure employment; the increased frequency of corporate takeovers, followed by restructuring and downsizing, which have cost many middle-managers their jobs; a series of spectacular corporate collapses; the erosion of union membership and of private retirement pension plan coverage; an increase in immigration, which about one-third of American polled by the *New York Times* in 1996 perceived as a threat to the job security of native-born North Americans; and the sense that increased foreign competition has forced U.S. firms to make more frequent and radical changes in their employment patterns.[1]

Although the research community has not yet reached consensus on the nature and causes of trends in the volatility of earnings and incomes (to say nothing of how best to quantify volatility, and its relation to insecurity, or to risk) there is one question in this debate that remains not only unanswered but unasked, namely: how does income volatility differ along regional lines? The question seems salient, given that industrial and occupational composition vary with geography, and that some areas have undergone rapid structural change, which one might expect to be reflected in the short-run evolution of local household incomes. A prominent example is that of the Great Lakes states, which accounted for more than 1 million of the 3 million manufacturing jobs that were lost nationwide between 2000 and 2005 (Wial and Friedhoff 2006).

Numerous previous analyses of this issue, at the national level, have estimated the transient component of cross-sectional male earnings inequality, using the Panel Study of Income Dynamics (PSID), and have found that it has increased (Haider 2001; Moffitt and Gottschalk 2002; Dynarski and Gruber 1997). Working with administrative data, however, Dahl, DeLeire, and Schwabish (2007) find no evidence of a such a trend. A related body of research on trends in employment stability is nicely summarized by David Neumark (Neumark 2000) who concludes that there is some evidence of a weakened attachment between employers and employees in the 1990s, but little evidence of a long-term trend.

This report looks not only at earnings, but at fluctuations in total household income per capita, which reflect both male and female earnings volatility, as well as variations in non-wage income, and changes in household composition. The data are drawn from two-year panels of the Current Population Surveys (CPS) from the 1980s, 1990s, and the current decade. Unlike the PSID, the CPS is large enough to disaggregate to the state level, particularly when adjacent pairs of years are pooled.[2]

Data and Methods

The data for this analysis are obtained from the Annual Social and Economic Supplements (ASEC) to the CPS, which measure total money income for the household for the previous calendar year.[3] Various measures of the annual change in log income per household member are studied; these are discussed as the results are reported.[4] Although the CPS is not designed as a longitudinal study, the fact that households are surveyed for four months, then left alone for eight, then resurveyed for four more months means that, in principle, half of all households appearing in one year's ASEC supplement (those in their first four interview months)

may also be found in the next year's survey. This report uses these linked two-year datasets from three eras, chosen for their comparable macroeconomic conditions, given that income volatility has a cyclical component. The first period uses the linked 1985 and 1986 files, and then pools these with the linked files from 1986 and 1987. (The dates listed here and elsewhere are the years the income was received, i.e. the year prior to the corresponding ASEC survey.). The second period covers 1992-1994, and the third covers 2003-2005.

The most important limitation of the CPS for longitudinal analyses is that it is a survey of residential dwellings, not households, meaning that people who change address from one year to the next are lost to follow-up, and their income change cannot be calculated. Moreover, because a change of residence frequently accompanies a change of employer, one would expect it to be predictive of larger-than-average income changes. If this is the case, no amount of reweighting or other modifications to the data for the non-movers can render them convincingly representative of the full U.S. population in terms of income volatility. Instead, the strategy taken here is to limit the universe under consideration to the set of non-movers, i.e. those households containing at least one person who lived at the same address one year ago. This sample definition implies that these estimates should understate national income volatility, although Peracchi and Welch (1995) provide evidence that this bias may be small. To their surprise, they find no major differences between observed labor force status transition rates among matched individuals and estimated rates among the unmatched, after controlling for observable factors such as sex, age and initial labor force status. What is more, the amount of any such bias should have lessened over time, since the rate of geographic mobility declined somewhat over the study period.[5]

Another important limitation of the data is that some 20 percent of the total value of household income in any given year is imputed by the Census Bureau, to replace missing data. While the methods of imputation are defensible, the use of imputed data could introduce large and unpredictable biases into the calculation of income volatility. For this analysis, households were dropped if imputed income made up more than ten percent of the total value of household income, in either year, which unfortunately results in the loss of 29 to 43 percent of matched households, with the larger figures coming from the more recent surveys. The remaining households were then reweighted to be representative of the full set of non-mover households along many dimensions, as detailed in the Appendix. The assumption here is that the use of imputed data would cause more problems than result from the reduction in sample size.

A third problem is that some income values are top-coded in the public release datasets, for reasons of confidentiality, meaning that actual values for particular components of income are replaced with $99,999, a threshold that stayed constant for many years. In later years the threshold was raised, and the data were not simply censored but rather replaced with average actual values for various demographic cells. Correcting for the changing degree to which the top-code threshold was binding has been shown to be crucial for understanding the evolution of the earnings distribution (Burkhauser, *et al.* 2004), and by implication, of the distribution of household income volatility. The procedure adopted here, which is similar to that used by Cameron and Tracy (1998), is to discard households that fell in the top 1.5 percent of the income distribution in either year. This eliminates all but a handful of the top-coded values, and does so in a way that has a consistent impact on the income distribution over time. It should again cause volatility to be understated, and also bias its estimated trend towards zero, since a rise in

volatility should imply a rise in the number of households moving into and out of the upper tail, and hence out of the sample, and vice versa for a fall in volatility.

Inconsistencies in the recording of *low* incomes have also been a source of difficulty for volatility researchers (Dynan, Elmendorf, and Sichel 2007). In particular, changes in the proportion of very low positive values in the data can have a large impact, since these become left-tail outliers in log form. The solution adopted here is to drop all households with reported incomes below $500 in real terms, at 2005 prices, using the CPI-U-RS (Bureau of Labor Statistics 2007).[6] This approach ensures that the results presented here are not driven by the experiences of very rich or improbably poor families, but rather pertain to about the middle 96% of the estimated income distribution, for households that did not change residence in the last year.

Findings

Table 1 reports the number of households in each period, which stands at 26,000 for the first two periods but falls to 22,000 in 2003-2005. The average number of households per state likewise falls, from 515 to about 436, but in no case did a state contain fewer than 197 observations. Reported median household incomes in the initial years of each period were close to the corresponding national estimates for the first two study periods, but significantly higher for these non-movers than for the nation as a whole in 2003-2005 (national estimates may be found in DeNavas-Walt, Proctor, and Lee 2006). Income per capita also rose significantly between 1992-1994 and 2003-2005. The average growth rate of gross domestic product (GDP) was very similar for all three study periods: this indeed was the criterion by which the years were chosen. Adult (age 16 and up) unemployment rates were also nearly equal for the first two study periods, but significantly lower in the third.

Upward and Downward Mobility

Table 2 presents a first look at income changes, by state. The median change in log real household income per person (i.e. the median approximate percentage change in actual per capita income[7]) is shown for each of the three periods. Note that these are measures of short-term *net upward or downward mobility*, as opposed to volatility, the latter being concerned with the size of income movements in either direction, not their net effect. The net mobility measures, however, are interesting in their own right, and their inclusion helps to clarify the difference between upward and/or downward mobility versus pure volatility. For the nation as a whole, the median change in per capita household income[8] stood at 1.6 percent in 1985-1987. All told, 26 states had positive growth rates that were significantly different from zero at the ten percent level

(in bold); of these, six exceeded four percent. Only one state, Louisiana, experienced a significantly negative median change in household income per person (at -3.2 percent), which doubtless reflects the downturn in the oil industry at that time, and implies that more Louisianans saw their real incomes fall than rise. Note, however, that sample sizes are smallest in the mountain states, making it harder to detect significant changes in that region.

From 1992 to 1994 median per capita income growth in this sample was lower, at 1.1 percent, and only 14 states had statistically significant growth, with just two exceeding the four percent threshold. In 2003-2005, the median change in household income was indistinguishable from zero, confirming the oft-noted fact that GDP growth has lately had a much smaller impact on the median household than in years past. Seven states had significant positive median growth, but none exceeded four percent, and one, Montana, had a negative median change. (Twenty-two states had negative estimates, but only Montana's was statistically significant.)

Income Volatility

The volatility of income can be measured in various ways, but all accomplish the same goal, which is effectively to treat all changes as positive numbers, rather than letting the negative and positive changes cancel one another. Two of the ways this may be done are by squaring the log changes, as occurs when calculating their variance or standard deviation, or by taking their absolute values. The latter method is used here, because it avoids placing disproportionate weight on larger percent income changes.[9] Table 3 thus reports the median absolute value of the change in log income per capita, by state, for a first look at geographic variation in household income volatility. The bold-faced entries now flag those states whose volatility was significantly above or below the aggregate national result. Several states, indicated by an (L), stand out as

having significantly lower-than-average volatility in at least two of the three time periods: these are Maine, Rhode Island, Pennsylvania, Ohio, Wisconsin, Minnesota, Missouri, Nebraska, and Maryland. By the same definition, the high-volatility states (H) were New York, Georgia, Florida, Texas, New Mexico, Arizona, and California.

Several findings emerge from this list. First, with the exception of Maryland, the low-volatility states are all located in the North (census region 1), and the Midwest (region 2). Similarly, with the exception of New York, the high-volatility states are all found in the South and West (regions 3 and 4). Second, no state had significantly above-average volatility in one period but below-average volatility in another, implying that major changes in relative rates of income volatility among states are uncommon. Another way of quantifying the importance of this geographic dimension is to note that the correlation between a state's volatility measure in the 1980s with its figure from two decades later was quite high, at 0.47. Third, of the seven major "rust-belt" states (those in census district 3 plus New York and Pennsylvania) only New York had higher-than-average volatility in any period, while Pennsylvania, Ohio, and Wisconsin all had lower-than-average volatility. This casts doubt on the hypothesis that job losses in manufacturing are a major cause of high income volatility, a question that is revisited below.

The bottom line of Table 3 shows that income volatility increased significantly from the 1980s to the 1990s, from 0.15 to 0.19, and increased again somewhat in 2003-2005, to 0.20. Recall that this implies that the median change in household income per person (in either direction) rose from 15 to 19 to 20 percent. In Table 4, these period-to-period changes in volatility are reported explicitly for each state, and for the nation as a whole, along with their standard errors and t-statistics. Both the large increase in national volatility between 1985-1987 and 1992-1994 (3.6 percentage points), as well as the smaller increase between 1992-1994 and

2003-2005 (0.9 percentage points) are statistically significant (at the five percent threshold or better), as is their sum (4.6 percentage points). Twenty-eight of the 51 states, from all parts of the country, saw statistically significant increases in income volatility between 1985-1987 and 2003-2005, and none saw a significant decrease.

The finding of continuing, albeit decelerating, growth in income volatility stands in contrast to the results of a recent study by the Congressional Budget Office (CBO), which examines wage earnings only, for those between the ages of 22 and 59. Using a similar volatility measure (the standard deviation of either annual log changes or annual arithmetic percentage changes) they find a generally downward trend from 1981 to 2003. Their results (for earnings) for 1992 to 1994 are slightly lower than for 1985 to 1987, in contrast to the increased volatility (of household income per person) documented here (see Dahl, *et al.* 2007, Figure 5 and Figure A-10).

An Increased Frequency of Large Income Changes

One way of illustrating the effects of this increased volatility of household income is to calculate the share of households whose real per capita income rose by more than 50 percent (in arithmetic percentage terms, not logs), as compared to the share who experienced at least a 50 percent decrease. This is done at the national level, and the results appear in Table 5. In the first period, 10.6 percent of households experienced such large gains, compared to 4.2 percent who experienced the large loss; the ratio of increases to decreases was thus 2.5 to 1. In the 1990s, the incidence of both big gains and big losses increased, and in the period 2003-2005, both increased further, to 14.0 and 7.6 percent. Now the large increases outnumbered the large losses by a

smaller margin, of 1.8 to 1. By this measure, the national increase in volatility appears to have been asymmetrical, with a bias towards relatively more frequent large losses.

These results again stand in contrast to the CBO's findings. They calculate that the share of prime-aged workers whose earnings declined by 50 percent or more over the previous year (in arithmetic percentage terms) fell from 15.5 percent in 1983, to 14.1 percent in 1993, to 13.6 percent in 2003, indicating a decline in volatility. The share who saw their earnings rise by 50 percent or more also trended downwards (towards lower volatility): the numbers were 24.2, 17.7, and 15.7 percent. In an appendix, the CBO reports somewhat flatter trends, based on logarithmic changes, but they find no evidence of the clear increase in volatility that is reported here (see Dahl, *et al*. 2007, Table 1 and Figures A-6 and A-8).[10]

Changes in Volatility by Income Quintile

Table 6 describes changes in volatility at different points in the income distribution, again taking a national perspective. As in the previous table, volatility is studied by examining upward and downward movements separately. In the upper half of the table, the first column reports the median (log) percentage change in income per person among only those households that gained income, grouped by their initial household income quintile, for each time period.[11] The mean-reverting nature of income fluctuations implies that upward movements will usually be larger at the bottom than at the top, and this is confirmed here. However, downward movements were generally of comparable median size for members of the 2nd through 5th quintiles.[12] In the final column, the net effect of these upward and downward movements (net mobility) is assessed. With just one exception, and for all three periods, the median change decreases monotonically as one moves up the income distribution, consistent with mean-reversion; the exception is that the

bottom quintile saw a smaller median change in income per capita in 1985-87 than did the second quintile (2.4 versus 3.4 percent).

The figures in the lower three panels measure the change over time in these quintile-by-quintile patterns of upward and downward income movements, with the significant differences between decades appearing in bold. It is clear that volatility and mobility patterns changed markedly from 1985-1987 to 1992-1994 (lower half, first panel), but did not change as much thereafter (second panel). The final panel reports the full change from the 1980s to 2003-2005. Households in the bottom four quintiles in 2003-2005 had both larger median gains, and larger median losses – in short, they experienced greater volatility – than in the 1980s. For the top quintile, losses were larger, but gains were not significantly different, which is consistent with the asymmetry noted earlier.

The net effect of the increased flux of incomes in both directions was arguably beneficial for those in the bottom quintile: they experienced a net increase in short-term upward mobility of 6.4 percentage points, measured at the median, in 2003-05 as compared to the 1980s (final column), meaning that a larger share of low-income households saw their income rise. All other quintiles experienced less net upward mobility at the median, by two to four percentage points, in 2003-2005 as compared to twenty years earlier. For example, the median net annual change in income per person for a household located in the middle quintile was 1.7 percent in the 1985-1987 (top half, first panel, last column), but was -0.7 percent in 2003-05 (top half, third panel, last column), for a change of -2.4 percentage points (lower half, last panel, last column).

Determinants of Volatility

Having constructed state-year-specific measures of income volatility, it is now possible to use regression analysis to see if these can be predicted by state-year-level macroeconomic indicators, and other factors that one might expect to have a bearing on income volatility. The median absolute value of the change in log income per person, for each state, and in each two-year period, serves as the dependent variable, yielding 51 x 6 = 306 state-year observations. The macroeconomic predictors are the absolute value of the percentage change in state-level GDP between years one and two, and the absolute value of the percentage point change in the statewide unemployment rate (both derived from standard sources). To control for industrial composition in the initial year, the employment shares in each of ten broad sectors are included, with manufacturing being the omitted reference category; these are based on employment tallies from this report's analytic sample, pertaining to the longest job held. Next comes a state-year-level non-agricultural union coverage variable, provided by Hirsch, Macpherson, and Vroman (2001), who have reconstructed a consistent time series for this measure from a combination of CPS surveys. These are entered as shares between zero and one. The level of labor force attachment in the base year is included next, in the form of the shares of adults of working age who were full and part time, and full and part year, workers, as opposed to non-workers, again derived from the sample at hand. These shares are disaggregated by gender to allow for the testing of the hypothesis that the secular increase in income volatility is due to an increase in women's labor force participation, with the argument being that women move in and out of employment more often than men.[13]

The results of this regression appear in Table 7. The first column shows that the variables just listed can explain 28 percent of the variance of per capita household income

volatility across states and years. The macroeconomic variables' estimated effects are of the expected sign, but are not significant; this may be due to the fact that the years in question were chosen with their (national) macroeconomic similarity in mind. The higher the year-one share of employment in agriculture, wholesale and retail trade, transportation, services, or public administration, as compared to manufacturing, the higher was subsequent income volatility. Three of the four female labor force attachment variables have negative signs, contrary to expectations.

In the next column, dummy variables for each year are included, with 1986 being the omitted category. These raise the R^2 to 39 percent, and 1993-1994 (but not 2004-2005) appears to be a more significantly more volatile time than were the 1980s, all else equal. The other results remain similar, although the time dummies absorb some of the effect of the fall in union density, reducing its coefficient.

In the third column, dummies for each state are included. These raise the R^2 to 61 percent, implying that much of the variation in volatility is associated with time-invariant state-specific differences that are not captured by this short list of control variables. With the inclusion of both year and state dummies, the other coefficients become estimates of the effect of a secular change in a given variable within each state (not of differences between states) and net of the overall national time trend in volatility. The macroeconomic measures remain insignificant, but increases over time in the shares of workers in agriculture, trade, and other services remain predictors of higher volatility, as compared to manufacturing. This implies that job losses in manufacturing are in fact associated with higher income volatility, even though the states that have suffered the greatest such losses remain among the least volatile, as previously noted.

The upward secular trend in volatility now emerges much more clearly, with the time dummies increasing monotonically during 1993-1994 and 2004-2005. Volatility in 2005 was 4.4 percentage points higher than in 1986, a figure which is in close agreement with the descriptive national results in Table 4. The union coverage effect, however, is eliminated. This implies that although states with higher initial union coverage rates have lower volatility, *changes* over time in a state's union density do not predict changes in volatility.

Last, there is no significant evidence for a positive association between the share of workers who are female in year one and subsequent household income volatility. For the three labor force categories that reflect less than full attachment, the coefficients are positive, but they are not remotely significant. The number of full-time full-year women workers, however, is predictive of *lower* subsequent volatility, which stands the initial hypothesis on its head, while among men, a higher share in full-time but part-year employment is predictive of higher volatility.

Concluding Comments

This has been a largely descriptive analysis, whose aim was to exploit the large sample sizes available in the CPS to permit a geographically disaggregated study of trends in the volatility of household income per capita in the U.S. In so doing, this report has had little to say about the complex normative implications of rising income volatility, but these deserve at least a brief mention. As is clear from Table 6, rising volatility is quite literally a doubled-edged sword, involving an increase in both large gains and large losses. Holding the growth rate of income constant, one may argue that less volatility is preferable, given the prevalence of risk aversion, and the psychological fact that losses generally exact a psychic cost that is greater than the psychic reward associated with gains of comparable size. Moreover, when the increase in volatility is accompanied by a *decrease* in the rate of income growth, as was experienced by the typical member of each of the top four quintiles between 1985-1987 and 2003-2005, there would seem to be little to cheer for. For the bottom quintile, however, the increase in volatility was associated with an *increased* rate of income growth, a combination whose implications for social welfare depend on the weights one attaches to these costs and benefits.

There is also the crucial question as to whether income changes are voluntary or otherwise, a question that is addressed only indirectly here. The assumption that women's movements into and out of employment are generally voluntary, if correct, implies that were an increase in volatility due to an increase in women's share of the labor force, it might not be worth worrying about. This report, however, finds no compelling evidence of a link between the feminization of the workforce and the rise in the volatility of per capita household income, and indeed finds some evidence to the contrary, although the regression analysis of Table 7 is surely not the last word on the matter.

Instead, factors that are highly correlated with location loom large, both those that are measured (namely, the industrial composition of employment, and union density in each state) and those that are not (and so are captured by the state dummy variables.) The finding that agriculture, trade, and other services are more volatile sources of household income than is manufacturing serves to emphasize that the impact of deindustrialization on the U.S. economy can be measured along many dimensions. Changes in average levels of income and wages are well documented, and the issue of inequality of incomes has also received an enormous amount of attention. Volatility, on the other hand, is a separate matter altogether, and one that deserves equal billing in debates over policies that affect employment and wages, as well as those that pertain to the non-wage components of household income.

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Table 1
Sample Characteristics and Macroeconomic Conditions

	1985-86 & 1986-87	1992-93 & 1993-94	2003-04 & 2004-05
Number of Households	26,246	26,316	22,232
Average Number per State	515	516	436
Minimum Number per State	197	210	201
Median Initial Income (2005 Prices)	$42,778	$42,535	$47,785
Median Initial Per Capita Income	$17,112	$17,811	$20,635
Average GDP Growth Rate (%)	3.5	3.4	3.6
Year 1 to Year 2	3.5	2.7	3.9
Year 2 to Year 3	3.4	4.0	3.2
Average Unemployment Rate (%)	6.8	6.8	5.5
Year 1	7.2	7.5	6.0
Year 2	7.0	6.9	5.5
Year 3	6.2	6.1	5.1

Sources: Sample statistics based on author's analysis of CPS ASEC public use datasets. "Initial incomes" are those observed in the first year of each two-year panel. GDP growth rates from Bureau of Economic Analysis; the first line is the simple average of the two years' growth rates below it. Unemployment rates from Bureau of Labor Statistics; the first line is the average of the annual estimates below it, each of which is the unweighted average of the seasonally adjusted monthly data, for all those aged 16 and over.

Table 2
Mobility: Median Annual Change in Log Real Household Income Per Person, By State[14]

Region	District	State	State	1985, 1986, 1987 Change in Logs	Std. Error	t	1992, 1993, 1994 Change in Logs	Std. Error	t	2003, 2004, 2005 Change in Logs	Std. Error	t
1	1	1	Maine	**0.033**	0.013	2.54	0.016	0.015	1.02	0.013	0.010	1.27
1	1	2	New Hampshire	**0.036**	0.013	2.84	0.025	0.019	1.29	**0.020**	0.011	1.83
1	1	3	Vermont	**0.020**	0.012	1.73	**0.031**	0.014	2.17	0.017	0.019	0.88
1	1	4	Massachusetts	**0.033**	0.007	5.07	-0.004	0.007	-0.55	-0.008	0.011	-0.80
1	1	5	Rhode Island	0.020	0.014	1.43	0.003	0.017	0.15	**0.018**	0.008	2.21
1	1	6	Connecticut	**0.056**	0.018	3.03	0.006	0.014	0.43	-0.003	0.008	-0.32
1	2	7	New York	**0.037**	0.007	5.26	0.009	0.006	1.58	0.002	0.010	0.24
1	2	8	New Jersey	**0.013**	0.007	1.86	-0.004	0.009	-0.45	0.002	0.013	0.19
1	2	9	Pennsylvania	**0.015**	0.006	2.68	0.005	0.006	0.80	-0.001	0.010	-0.13
2	3	10	Ohio	0.007	0.005	1.43	**0.024**	0.006	3.68	0.003	0.008	0.46
2	3	11	Indiana	0.012	0.011	1.04	**0.036**	0.016	2.32	-0.002	0.015	-0.15
2	3	12	Illinois	**0.023**	0.006	3.48	0.011	0.007	1.42	0.013	0.010	1.28
2	3	13	Michigan	**0.014**	0.007	1.95	**0.030**	0.009	3.42	-0.001	0.008	-0.16
2	3	14	Wisconsin	**0.028**	0.009	3.12	**0.028**	0.010	2.79	0.004	0.010	0.41
2	4	15	Minnesota	**0.044**	0.010	4.23	0.002	0.012	0.18	-0.014	0.010	-1.45
2	4	16	Iowa	**0.023**	0.010	2.23	0.007	0.011	0.64	0.000	0.011	0.00
2	4	17	Missouri	**0.018**	0.009	1.99	-0.018	0.014	-1.31	-0.012	0.010	-1.14
2	4	18	North Dakota	-0.008	0.013	-0.60	**0.032**	0.015	2.17	0.024	0.016	1.52
2	4	19	South Dakota	**0.017**	0.010	1.71	-0.006	0.010	-0.60	0.019	0.013	1.49
2	4	20	Nebraska	0.013	0.013	1.03	0.013	0.015	0.85	0.000	0.011	0.04
2	4	21	Kansas	0.002	0.012	0.13	**0.040**	0.018	2.29	-0.016	0.011	-1.44
3	5	22	Delaware	**0.063**	0.015	4.34	0.005	0.025	0.19	0.005	0.022	0.22
3	5	23	Maryland	**0.022**	0.012	1.82	-0.028	0.022	-1.29	0.010	0.015	0.64
3	5	24	District of Columbia	**0.046**	0.018	2.57	-0.006	0.021	-0.30	0.009	0.019	0.48
3	5	25	Virginia	**0.027**	0.012	2.32	0.014	0.012	1.19	0.000	0.016	-0.02
3	5	26	West Virginia	0.001	0.010	0.07	0.011	0.014	0.80	0.013	0.015	0.83
3	5	27	North Carolina	**0.013**	0.006	2.25	0.012	0.010	1.22	-0.010	0.012	-0.87
3	5	28	South Carolina	0.022	0.015	1.48	0.009	0.015	0.60	-0.006	0.012	-0.49
3	5	29	Georgia	0.006	0.015	0.38	**0.035**	0.020	1.71	-0.032	0.023	-1.36
3	5	30	Florida	**0.018**	0.008	2.37	0.003	0.010	0.29	0.007	0.011	0.63
3	6	31	Kentucky	0.018	0.014	1.34	0.009	0.010	0.88	0.015	0.016	0.97
3	6	32	Tennessee	0.003	0.008	0.44	**0.026**	0.012	2.09	0.019	0.023	0.84
3	6	33	Alabama	0.009	0.015	0.64	0.023	0.019	1.20	-0.004	0.012	-0.30
3	6	34	Mississippi	0.004	0.010	0.45	**0.023**	0.014	1.65	-0.009	0.023	-0.38
3	7	35	Arkansas	0.015	0.015	1.03	-0.004	0.013	-0.33	-0.016	0.014	-1.17
3	7	36	Louisiana	**-0.032**	0.010	-3.22	0.013	0.015	0.90	0.019	0.028	0.68
3	7	37	Oklahoma	0.004	0.016	0.25	-0.009	0.016	-0.57	0.008	0.015	0.55
3	7	38	Texas	-0.003	0.008	-0.36	0.007	0.009	0.75	**0.021**	0.010	2.09
4	8	39	Montana	-0.005	0.012	-0.37	0.016	0.016	0.99	**-0.026**	0.014	-1.83
4	8	40	Idaho	0.009	0.009	0.97	0.001	0.011	0.06	-0.011	0.013	-0.87
4	8	41	Wyoming	0.015	0.013	1.12	0.015	0.017	0.91	-0.003	0.012	-0.24
4	8	42	Colorado	-0.018	0.015	-1.15	**0.043**	0.014	3.17	-0.014	0.012	-1.21
4	8	43	New Mexico	0.016	0.016	1.00	0.028	0.020	1.40	-0.004	0.022	-0.18
4	8	44	Arizona	0.009	0.014	0.66	**0.034**	0.019	1.81	0.031	0.021	1.49
4	8	45	Utah	**0.044**	0.020	2.19	0.016	0.011	1.52	**0.040**	0.016	2.46
4	8	46	Nevada	**0.037**	0.020	1.81	-0.018	0.018	-0.96	0.009	0.013	0.70
4	9	47	Washington	**0.022**	0.009	2.31	**0.037**	0.017	2.12	-0.001	0.010	-0.10
4	9	48	Oregon	0.013	0.009	1.57	0.024	0.015	1.63	-0.003	0.016	-0.21
4	9	49	California	**0.014**	0.007	2.05	0.005	0.008	0.62	-0.003	0.007	-0.44
4	9	50	Alaska	-0.006	0.021	-0.31	**0.036**	0.019	1.90	0.001	0.021	0.07
4	9	51	Hawaii	**0.044**	0.020	2.17	-0.009	0.022	-0.41	0.016	0.013	1.23
			United States	**0.016**	0.002	9.75	**0.011**	0.002	5.48	0.001	0.002	0.72

Table 3
Volatility: Median Absolute Value of Change in Log Income Per Person, By State[14]

Region	District	State	State	1985, 1986, 1987 Change in Logs	Std. Error	=US? t	1992, 1993, 1994 Change in Logs	Std. Error	=US? t	2003, 2004, 2005 Change in Logs	Std. Error	=US? t
1	1	1	Maine (L)	**0.13**	0.011	-2.15	0.20	0.019	0.72	**0.16**	0.015	-2.48
1	1	2	New Hampshire	0.14	0.017	-0.44	0.17	0.020	-0.78	0.18	0.015	-1.37
1	1	3	Vermont	0.15	0.014	0.07	0.18	0.013	-0.90	0.19	0.016	-0.47
1	1	4	Massachusetts	0.14	0.007	-1.61	0.18	0.010	-0.59	0.19	0.015	-0.80
1	1	5	Rhode Island (L)	**0.12**	0.014	-2.42	0.19	0.016	-0.09	**0.17**	0.016	-1.73
1	1	6	Connecticut	0.14	0.018	-0.67	**0.16**	0.015	-2.02	0.17	0.015	-1.49
1	2	7	New York (H)	**0.18**	0.006	4.06	**0.21**	0.010	1.67	0.21	0.013	1.06
1	2	8	New Jersey	0.15	0.010	-0.47	**0.22**	0.011	2.46	0.19	0.016	-0.62
1	2	9	Pennsylvania (L)	**0.14**	0.007	-2.12	**0.16**	0.007	-3.66	0.18	0.017	-0.89
2	3	10	Ohio (L)	**0.13**	0.005	-4.80	**0.17**	0.008	-2.61	**0.16**	0.009	-3.82
2	3	11	Indiana	**0.13**	0.009	-1.87	0.17	0.022	-0.97	0.20	0.013	0.40
2	3	12	Illinois	0.14	0.008	-1.23	0.19	0.012	0.54	**0.18**	0.012	-1.66
2	3	13	Michigan	0.15	0.008	-0.67	0.19	0.009	0.37	0.20	0.020	0.01
2	3	14	Wisconsin (L)	**0.12**	0.012	-2.28	**0.14**	0.009	-5.01	0.18	0.015	-1.05
2	4	15	Minnesota (L)	0.15	0.013	-0.39	**0.16**	0.014	-1.71	**0.17**	0.010	-2.19
2	4	16	Iowa	0.14	0.017	-0.49	0.17	0.023	-0.75	**0.14**	0.013	-4.04
2	4	17	Missouri (L)	0.16	0.011	0.32	**0.15**	0.014	-2.67	**0.15**	0.014	-3.28
2	4	18	North Dakota	0.17	0.018	1.02	0.17	0.016	-1.40	0.17	0.013	-1.93
2	4	19	South Dakota	0.16	0.012	0.82	0.17	0.022	-0.86	0.18	0.017	-0.95
2	4	20	Nebraska (L)	**0.12**	0.011	-3.05	0.19	0.012	0.02	**0.15**	0.012	-3.52
2	4	21	Kansas	0.16	0.016	0.48	**0.16**	0.015	-2.02	0.20	0.019	-0.12
3	5	22	Delaware	**0.13**	0.013	-1.71	0.19	0.029	-0.10	0.22	0.016	1.56
3	5	23	Maryland (L)	0.14	0.014	-0.85	**0.16**	0.015	-1.76	**0.16**	0.021	-1.96
3	5	24	District of Columbia	0.18	0.020	1.34	0.24	0.033	1.41	0.21	0.030	0.41
3	5	25	Virginia	0.14	0.011	-0.77	0.16	0.017	-1.53	0.17	0.017	-1.46
3	5	26	West Virginia	0.13	0.014	-1.54	0.16	0.015	-1.64	0.17	0.023	-1.09
3	5	27	North Carolina	0.15	0.007	0.14	0.21	0.010	1.58	0.22	0.020	1.21
3	5	28	South Carolina	0.15	0.008	-0.08	0.20	0.021	0.34	**0.24**	0.022	1.72
3	5	29	Georgia (H)	0.15	0.018	-0.03	**0.23**	0.021	1.80	**0.24**	0.023	1.65
3	5	30	Florida (H)	**0.17**	0.009	1.74	0.19	0.013	0.12	**0.23**	0.013	2.12
3	6	31	Kentucky	0.14	0.018	-0.40	**0.15**	0.021	-1.92	0.20	0.022	0.09
3	6	32	Tennessee	0.14	0.013	-0.96	**0.16**	0.013	-1.97	0.17	0.017	-1.44
3	6	33	Alabama	0.16	0.017	0.21	0.17	0.018	-1.15	0.18	0.022	-0.84
3	6	34	Mississippi	0.15	0.018	-0.12	**0.26**	0.020	3.31	0.22	0.025	0.90
3	7	35	Arkansas	0.18	0.016	1.55	0.18	0.015	-0.60	**0.25**	0.025	2.19
3	7	36	Louisiana	0.15	0.016	-0.09	**0.24**	0.024	2.10	0.23	0.034	0.89
3	7	37	Oklahoma	0.17	0.015	1.59	0.19	0.025	0.19	0.19	0.022	-0.40
3	7	38	Texas (H)	**0.17**	0.009	1.90	**0.23**	0.010	3.79	**0.23**	0.015	2.18
4	8	39	Montana	0.15	0.012	0.00	0.21	0.017	1.40	0.20	0.019	0.36
4	8	40	Idaho	0.16	0.021	0.25	**0.16**	0.012	-2.30	0.17	0.019	-1.30
4	8	41	Wyoming	0.18	0.026	0.94	0.19	0.019	0.28	0.18	0.024	-0.54
4	8	42	Colorado	0.13	0.017	-0.98	0.18	0.017	-0.47	0.18	0.021	-0.62
4	8	43	New Mexico (H)	**0.19**	0.018	2.10	0.19	0.026	0.09	**0.25**	0.030	1.75
4	8	44	Arizona (H)	**0.19**	0.022	1.87	0.18	0.016	-0.22	**0.24**	0.024	1.75
4	8	45	Utah	0.17	0.011	1.40	0.17	0.020	-0.91	0.18	0.018	-1.20
4	8	46	Nevada	0.15	0.017	-0.09	0.17	0.016	-0.86	0.20	0.015	-0.12
4	9	47	Washington	0.14	0.014	-0.64	0.18	0.015	-0.75	0.18	0.018	-0.97
4	9	48	Oregon	0.16	0.018	0.21	0.19	0.016	0.26	0.19	0.025	-0.36
4	9	49	California (H)	0.16	0.006	1.20	**0.22**	0.009	3.07	**0.22**	0.012	1.90
4	9	50	Alaska	**0.21**	0.021	2.83	0.20	0.026	0.60	0.21	0.019	0.88
4	9	51	Hawaii	0.19	0.026	1.58	0.18	0.024	-0.52	**0.17**	0.018	-1.67
			United States	0.15	0.002		0.19	0.003		0.20	0.003	

Table 4
Changes in the Volatility of Income Per Person, By State[14]

Region	District	State	State	1980s to 1990s			1990s to 2000s			1980s to 2000s		
				Change	Std. Err.	t	Change	Std. Error	t	Change	Std. Error	t
1	1	1	Maine	**0.075**	0.022	3.40	**-0.041**	0.024	-1.73	**0.033**	0.018	1.81
1	1	2	New Hampshire	0.028	0.027	1.06	0.004	0.025	0.17	0.033	0.023	1.42
1	1	3	Vermont	0.023	0.019	1.20	0.014	0.021	0.67	**0.037**	0.021	1.73
1	1	4	Massachusetts	**0.042**	0.012	3.47	0.003	0.018	0.19	**0.045**	0.016	2.77
1	1	5	Rhode Island	**0.069**	0.021	3.28	-0.018	0.023	-0.78	**0.051**	0.021	2.40
1	1	6	Connecticut	0.017	0.023	0.73	0.018	0.021	0.84	0.035	0.023	1.51
1	2	7	New York	**0.029**	0.012	2.54	0.006	0.017	0.38	**0.036**	0.014	2.49
1	2	8	New Jersey	**0.070**	0.015	4.63	-0.029	0.019	-1.52	**0.041**	0.019	2.19
1	2	9	Pennsylvania	**0.024**	0.010	2.40	0.021	0.019	1.14	**0.046**	0.019	2.42
2	3	10	Ohio	**0.040**	0.010	4.20	-0.005	0.012	-0.43	**0.035**	0.010	3.31
2	3	11	Indiana	0.032	0.023	1.38	0.036	0.025	1.43	**0.068**	0.016	4.38
2	3	12	Illinois	**0.053**	0.014	3.69	-0.017	0.017	-1.04	**0.036**	0.014	2.50
2	3	13	Michigan	**0.046**	0.012	3.71	0.006	0.022	0.28	**0.052**	0.022	2.38
2	3	14	Wisconsin	0.015	0.015	1.01	**0.041**	0.018	2.29	**0.056**	0.019	2.91
2	4	15	Minnesota	0.018	0.019	0.92	0.010	0.017	0.56	0.027	0.017	1.62
2	4	16	Iowa	0.028	0.028	0.98	-0.029	0.026	-1.10	-0.001	0.022	-0.05
2	4	17	Missouri	-0.004	0.017	-0.24	0.000	0.020	0.00	-0.004	0.017	-0.25
2	4	18	North Dakota	-0.005	0.024	-0.21	0.006	0.021	0.31	0.001	0.022	0.06
2	4	19	South Dakota	0.007	0.025	0.29	0.012	0.028	0.43	0.019	0.021	0.92
2	4	20	Nebraska	**0.071**	0.017	4.24	**-0.034**	0.017	-1.98	**0.037**	0.016	2.24
2	4	21	Kansas	-0.002	0.022	-0.11	0.038	0.025	1.55	0.036	0.025	1.43
3	5	22	Delaware	**0.055**	0.031	1.75	0.038	0.033	1.14	**0.093**	0.020	4.59
3	5	23	Maryland	0.022	0.020	1.11	-0.006	0.025	-0.22	0.016	0.025	0.66
3	5	24	District of Columbia	0.057	0.039	1.46	-0.026	0.045	-0.57	0.031	0.036	0.88
3	5	25	Virginia	0.018	0.021	0.89	0.012	0.024	0.49	0.030	0.020	1.49
3	5	26	West Virginia	0.032	0.020	1.58	0.009	0.028	0.34	0.041	0.027	1.55
3	5	27	North Carolina	**0.052**	0.013	4.15	0.017	0.023	0.75	**0.070**	0.021	3.24
3	5	28	South Carolina	**0.044**	0.023	1.94	0.040	0.031	1.32	**0.085**	0.024	3.59
3	5	29	Georgia	**0.076**	0.028	2.72	0.008	0.031	0.27	**0.084**	0.029	2.92
3	5	30	Florida	0.022	0.016	1.40	**0.037**	0.019	1.97	**0.059**	0.016	3.68
3	6	31	Kentucky	0.004	0.028	0.13	**0.051**	0.030	1.72	**0.055**	0.028	1.94
3	6	32	Tennessee	0.024	0.018	1.31	0.009	0.021	0.44	0.033	0.022	1.53
3	6	33	Alabama	0.012	0.025	0.47	0.012	0.029	0.40	0.023	0.028	0.83
3	6	34	Mississippi	**0.106**	0.027	3.93	-0.035	0.032	-1.10	**0.071**	0.031	2.30
3	7	35	Arkansas	0.002	0.022	0.08	**0.074**	0.029	2.52	**0.075**	0.030	2.54
3	7	36	Louisiana	**0.089**	0.029	3.04	-0.012	0.042	-0.28	**0.077**	0.038	2.06
3	7	37	Oklahoma	0.018	0.029	0.62	-0.004	0.033	-0.13	0.014	0.027	0.51
3	7	38	Texas	**0.060**	0.014	4.38	0.003	0.018	0.15	**0.062**	0.018	3.54
4	8	39	Montana	**0.060**	0.021	2.87	-0.008	0.026	-0.30	**0.053**	0.023	2.32
4	8	40	Idaho	0.002	0.025	0.09	0.013	0.023	0.59	0.016	0.029	0.54
4	8	41	Wyoming	0.017	0.032	0.51	-0.009	0.030	-0.29	0.008	0.036	0.22
4	8	42	Colorado	**0.045**	0.024	1.86	0.005	0.027	0.18	**0.050**	0.027	1.86
4	8	43	New Mexico	0.001	0.031	0.02	0.060	0.039	1.52	**0.061**	0.035	1.73
4	8	44	Arizona	-0.008	0.027	-0.30	**0.056**	0.029	1.92	0.047	0.032	1.47
4	8	45	Utah	0.003	0.023	0.13	0.006	0.027	0.23	0.009	0.021	0.44
4	8	46	Nevada	0.024	0.023	1.06	0.021	0.022	0.98	**0.046**	0.022	2.04
4	9	47	Washington	0.034	0.021	1.64	0.003	0.024	0.13	0.037	0.023	1.61
4	9	48	Oregon	0.037	0.024	1.50	-0.004	0.030	-0.13	0.033	0.031	1.05
4	9	49	California	**0.058**	0.011	5.13	0.003	0.015	0.23	**0.061**	0.014	4.49
4	9	50	Alaska	-0.007	0.033	-0.21	0.010	0.032	0.32	0.003	0.028	0.12
4	9	51	Hawaii	-0.017	0.036	-0.48	-0.009	0.031	-0.29	-0.026	0.032	-0.83
			United States	**0.036**	0.003	11.52	**0.009**	0.004	2.42	**0.046**	0.003	13.32

Table 5
Incidence of 50 Percent Changes in Household Income Per Person

	1985-87	1992-94	2003-05
Share of households with at least 50 % increase	0.106	0.137	0.140
Share of households with at least 50 % decrease	0.042	0.070	0.076
Ratio Increases:Decreases	2.50	1.95	1.84

Source: Author's calculations based on CPS ASEC public use datasets. Conventional standard errors, which assume independence between households with large gains and those with large losses, are reported. These are arithmetic percentages, not log changes, unlike most other results in this report. The number experiencing declines of 50 log points or more was greater than the number gaining 50 log points in 2003-05, whereas the reverse had been true in the 1980s.

Table 6
Volatility and Mobility of Per Capita Income, By Household Income Quintile[11]

Year	Quintile	Volatility: Median Log Income Gain	Std. Error	Volatility: Median Log Income Loss	Std. Error	Mobility: Median Log Income Change	Std. Error
1985-87	1	0.28	0.011	-0.10	0.005	0.024	0.004
	2	0.20	0.007	-0.16	0.008	0.034	0.004
	3	0.15	0.003	-0.16	0.006	0.017	0.004
	4	0.13	0.003	-0.14	0.005	0.012	0.003
	5	0.12	0.003	-0.16	0.006	0.000	0.003
	All	0.16	0.002	-0.15	0.003	0.016	0.002
1992-94	1	0.39	0.018	-0.18	0.009	0.095	0.007
	2	0.21	0.008	-0.20	0.010	0.031	0.005
	3	0.17	0.006	-0.19	0.008	0.002	0.004
	4	0.15	0.005	-0.19	0.006	-0.005	0.003
	5	0.12	0.004	-0.22	0.007	-0.033	0.005
	All	0.18	0.003	-0.20	0.004	0.011	0.002
2003-05	1	0.36	0.016	-0.13	0.009	0.088	0.008
	2	0.23	0.007	-0.20	0.013	0.016	0.004
	3	0.20	0.006	-0.20	0.010	-0.007	0.005
	4	0.16	0.005	-0.20	0.008	-0.019	0.004
	5	0.13	0.006	-0.23	0.009	-0.043	0.006
	All	0.20	0.004	-0.20	0.005	0.001	0.002

		Comparing Decades: Income Gainers		Comparing Decades: Income Losers		Comparing Decades: All Households	
	Quintile	Difference	t	Difference	t	Difference	t
1980s to 1990s	1	**0.110**	5.37	**-0.074**	-7.18	**0.071**	8.63
	2	**0.019**	1.90	**-0.045**	-3.57	-0.003	-0.47
	3	**0.016**	2.35	**-0.034**	-3.45	**-0.015**	-2.65
	4	**0.019**	3.25	**-0.044**	-5.64	**-0.017**	-3.94
	5	-0.001	-0.11	**-0.058**	-5.98	**-0.033**	-5.85
	All	**0.024**	6.46	**-0.052**	-10.78	**-0.005**	-2.05
1990s to 2000s	1	-0.028	-1.19	**0.048**	3.72	-0.007	-0.63
	2	0.012	1.20	0.000	0.00	**-0.016**	-2.44
	3	**0.027**	3.09	-0.010	-0.77	-0.008	-1.23
	4	0.008	1.15	-0.014	-1.40	**-0.014**	-2.60
	5	0.010	1.42	-0.015	-1.32	-0.010	-1.38
	All	**0.017**	3.40	-0.002	-0.39	**-0.010**	-3.37
1980s to 2000s	1	**0.081**	4.30	**-0.026**	-2.54	**0.064**	6.93
	2	**0.032**	3.31	**-0.045**	-3.01	**-0.019**	-3.26
	3	**0.043**	6.19	**-0.044**	-3.88	**-0.024**	-3.73
	4	**0.027**	4.32	**-0.058**	-6.03	**-0.031**	-6.35
	5	0.010	1.53	**-0.073**	-6.68	**-0.043**	-6.54
	All	**0.040**	8.87	**-0.054**	-9.63	**-0.015**	-5.28

Source: Author's calculations based on CPS ASEC public use datasets. Standard errors of medians are bootstrapped, with 200 repetitions. See also note 11.

Table 7
Regression Analysis of Determinants of Household Income Volatility
Dependent variable: Median absolute value of change in log household income per person, by state and year

Regressors:	Coefficient	t	Coefficient	t	Coefficient	t
Abs. value of percent change in GDP	0.054	0.65	0.068	0.83	0.061	0.82
Abs. value of percentage point change in unemployment	0.001	0.35	0.000	0.00	-0.003	-0.96
Employment Shares by Industry (Manufacturing omitted)						
Agriculture	**0.125**	2.14	**0.102**	1.83	**0.252**	2.54
Mining	-0.153	-1.15	**-0.203**	-1.71	-0.227	-1.29
Construction	0.038	0.37	0.012	0.13	-0.085	-0.86
Wholesale and retail trade	**0.211**	3.25	**0.138**	2.24	**0.139**	1.93
Transportation services	**0.308**	3.25	**0.249**	2.71	0.143	1.40
Finance, insurance and real estate	0.070	0.69	0.101	1.07	0.075	0.77
Professional and business services	**0.214**	4.31	**0.140**	2.83	0.121	1.61
Other services	**0.235**	6.51	**0.183**	3.70	**0.134**	1.69
Public administration	**0.121**	2.07	**0.137**	2.17	0.001	0.01
Union Coverage Rate	**-0.128**	-4.04	**-0.093**	-3.07	0.050	0.42
Labor Force Shares in Year 1 (Non-workers omitted)						
Women, full time, full year	-0.021	-0.28	**-0.181**	-2.33	**-0.138**	-1.71
Women, full time, part year	0.045	0.31	0.057	0.43	0.017	0.13
Women, part time, full year	-0.069	-0.57	**-0.254**	-2.24	0.114	0.83
Women, part time, part year	**-0.305**	-2.88	-0.161	-1.57	0.047	0.44
Men, full time, full year	-0.031	-0.41	-0.031	-0.46	0.049	0.56
Men, full time, part year	0.181	1.38	0.200	1.61	**0.274**	2.06
Men, part time, full year	-0.284	-1.11	-0.192	-0.80	-0.002	-0.01
Men, part time, part year	**-0.318**	-1.86	-0.266	-1.64	-0.235	-1.28
Time Dummies (1986 omitted)						
1987			-0.007	-1.43	-0.006	-1.24
1993			**0.026**	4.55	**0.029**	4.70
1994			**0.031**	5.92	**0.037**	6.09
2004			0.021	1.29	**0.041**	1.93
2005			0.022	1.37	**0.044**	2.17
State Dummies	None		None		Included	
R-squared	0.28		0.39		0.61	
Observations (State-years)	306		306		306	

Notes: See text for data sources. Bold entries are statistically different from zero at the 10 percent level or better. Heteroskedasticity-robust standard errors underlie the reported t-statistics.

Appendix: Matching and reweighting the CPS ASEC files

The first step in constructing the data for this report was to link the CPS March ASEC files from adjacent years. Madrian and Lefgren (1999) note various reasons why households and individuals in one survey may not be found in the next. This will occur if people move or die between surveys, but also if they are non-contactable (as perhaps on vacation) or refuse to be interviewed in either year. Finally, there is the possibility of recording errors in the dwelling identifiers, and the fact that the personal identifiers (a sequential person number) within a household were not always invariant over time. Still, a large proportion of high-quality matches can be constructed by first matching on the available household and person identifiers, and then deleting "false positive" matches, namely those who appear to be different people in terms of age, sex, race or other factors. This process yielded correlations between the two values of age for matched individuals that were on the order of 0.993 or higher.

Matches were performed from the year two dataset backwards to year one, because the eventual aim was to reweight the matched dataset to have the same characteristics as the set of non-movers, a set which is only identifiable in year two. This means selecting dwellings who were in survey months five through eight in year two, and matching them back to those who were in months one through four in year one. Households are identified by a dwelling number, which should be invariant over time, barring recording error, plus a household number. Using both of these as matching criteria should prevent households who are newly occupying a dwelling in year two from being linked to that dwelling's former occupants.

Prior to the 1990s, for reasons that are not entirely clear, the individual line numbers were not unique within a household in given year. Any households containing such duplicates were dropped; this had virtually no effect on the number of matchable households, as only about one

percent of people with duplicated line numbers appeared in the next year's survey. A larger problem was that, as noted above, the individual identifier or line number was not always invariant over time. In particular, as household composition changed, people were often renumbered in a slightly different order. After first matching individuals on dwelling, household, and stated line number, remaining unmatched individuals were then checked against the person who had a line number one higher or one lower, who also was required to be as yet unmatched, and the quality of these additional matches was evaluated, along with the initial matches, using a scoring system. One point was awarded for agreement on each of four variables: race, age, education and veteran status, where age was allowed to advance by zero, one, or two years between the surveys, and education was allowed to advance by one year for those aged 30 or less. A person was deemed a good match if they had a score of three or four points, also agreed on sex, and said they had lived in the dwelling one year earlier.

Finally, there is the question of how many well-matched individuals must be found to justify concluding that the household is the same. This is not simply a technical question: for instance, most would agree that a household is the same if the elderly male who is the designated head of household dies, leaving only his widow. But what if a male head moves out, and a new one moves in, adding his children from a prior marriage to the mix? One simplifying step was to drop all households listed as group quarters, for which this issue is particularly intractable. For the rest the decision rule was as follows: a household was deemed to be a good match if at least one person in it was a good match, and the total number of good matches was greater than or equal to the smaller of the two household sizes minus one. As an example, a household that contained three people in one year and five in the next would be deemed a good match if at least two individuals within it were well-matched.

After the matching, the distressingly large number of households for which more than ten percent of income was imputed, in either year, were dropped. The remaining households were then reweighted to match the full dataset of non-mover households from year two, using a logistic regression that had as covariates: household income, state of residence, rural residence, rental status, the race and gender of the household head, the average age, education, and proportion married, and the total size of the household, broken down into counts by occupation and industry of the longest job held last year. Finally, the top 1.5 percent of households ranked by real income in either year, as well as those with incomes less than $500 at 2005 prices, were dropped

Notes

[1] See the 1996 *New York Times* series entitled "The Downsizing of America," which ran from March 3rd through 9th and includes extensive opinion poll results, all of which may be found at: http://www.nytimes.com/specials/downsize/glance.html.

[2] A disadvantage of the CPS, however, is that with only two-year panels one cannot employ more sophisticated error-components models, which take account of the serial correlation of transient shocks, to separate the permanent from the transient components of cross-sectional income inequality.

[3] Sources of income include earnings, self-employment (farm and non-farm), social security and disability, public assistance, other pensions, alimony and child support, unemployment and workers compensation, interest, dividends, and rents received. These are recorded in pretax terms. No imputation is made for the value of non-cash income. In recent years questions have been asked in somewhat greater detail (i.e. first and second sources of retirement income) but the fundamental categories have remained the same.

[4] Taking the log of income has several advantages. First, it pulls in the long-right tail of the income distribution, rendering the results less dependent on the experiences of the top decile. Second, and perhaps of more fundamental importance, log income is a progressive welfare measure: it captures the fact that a $1000 change is of far greater concern to a family earning $20,000 than to one earning $100,000.

[5] The share of individuals who reported living in the same dwelling as last year was 81 percent in 1985-1987, rising to 83 percent in 1992-1994, and 86 percent in 2003-2005.

[6] In the 1980s and 1990s, fewer than one percent of households reported incomes this low, including those reporting zero or negative income. That share, however, rose to more than 1.5 percent in the 2000s, which would bias the results in the direction of increasing income volatility were these improbably low values not eliminated. Note that negative outcomes are permitted for farm and non-farm self-employment and for rental income. The lowest admissible value has been fixed at -$9,999 for an individual for many years, meaning that it has had a varying impact in real terms. (Since the mid-1990s two sources of self-employment and farm income have been reportable, which reduced the lower threshold to -$19,998 for people with multiple sources, but very few fall in this category). The declining real value of this lower limit has meant that an increasing share of household income totals contain a bottom-coded component. For example, for individual self employment, the share of losses that equaled or exceeded $9,999, and were thus censored at this value, rose from 17-19 percent in the 1980s and 1990s to 27 percent in 2005. This should again reduce measured income volatility in the most recent period.

[7] Differences in logs are good approximations of arithmetic percentage differences for small changes, but the approximation breaks down for larger changes. However, this is more a strength than a weakness of the logarithmic approach. Log changes provide a symmetrical measure of percentage difference, i.e. one that is the same calculated from year one to year two as the other way around. One consequence of this is that people with very low incomes in a given year, who can display extremely large arithmetic percent changes from that year to the

next, are assigned more reasonable values in log terms, reducing the number of highly influential observations.

[8] Note that although the *mean change* in income per person, across households, must equal the aggregate *change in mean* household income per person, the same is not true for medians.

[9] One subtle difference between the two approaches is that the absolute values are always measured as deviations from zero, whereas variances are based on deviations from the mean for a given state and year. When these means are different across states, then the national aggregate result will reflect important between-state effects, which are not captured by the within-state variances. Hertz (2007) discusses this issue in the related context of calculating intergenerational correlations for subgroups of the population.

[10] It is possible that this difference reflects a genuine difference in the evolution of earnings volatility as opposed to that of household income per person, but the comparison is complicated by the problem of zero values. In the CBO study, workers with zero earnings in the first year but positive earnings in the second were coded as experiencing 100 percent income growth, and would thus be counted among those experiencing growth of 50 percent or more. This effectively mirrors the treatment of job losers, for whom the actual percentage change is indeed negative 100. Workers with no earnings in either year had to be excluded. In household terms, an individual's transition into or out of employment is unlikely to create a 100 change in income, implying that the share of 50 percent changes ought be smaller for household incomes than for earnings, as it appears to be. But this does not yet explain the difference between the direction of the trends observed here and in the CBO study.

[11] Income quintiles are defined using a variable supplied in the public use datasets, which pertains to the full national household income distribution, not to the analytic sub sample of non-imputed non-movers, and not defined on a per capita basis. The top and bottom quintiles thus contain slightly fewer than 20 percent of households, due to the exclusion of very high and very low incomes. The outcome under study, however, is log household income per person.

[12] Missing from this table are the percentages of households who fall in each cell: mean reversion can occur through their being *more* downward movers at the top than at the middle, even if the magnitudes of movement are similar.

[13] As an example of the popularity of this hypothesis, see Kim, *et al*. (2007).

[14] [The following notes to Tables 2, 3, and 4 belong below the tables, but did not fit].

Source: Author's calculations based on CPS ASEC public use datasets.

Notes: Standard errors obtained via the bootstrap, with 200 repetitions per state. Bold faced entries are those whose t-statistics are larger than 1.645, the threshold for a statistically significant difference from zero, at the 10 percent level. See text for sample and variable definitions.