THE IMPACT OF CHANGING EARNINGS VOLATILITY ON RETIREMENT WEALTH

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Abstract

Over the last several decades, the volatility of family income has increased markedly, and own earnings volatility has remained relatively flat. Volatility may affect retirement wealth, depending on whether volatility affects accrued pension contributions or withdrawals or earnings credited toward future Social Security benefits. This project assesses the effect of the volatility of individual and family earnings on asset accumulation and projected retirement wealth using survey data matched to administrative earnings records.

I. Introduction

Over the last several decades, the volatility of family income has increased markedly, and own earnings volatility has remained relatively flat (Nichols and Zimmerman 2008). Volatility may affect retirement wealth, depending on whether volatility affects accrued pension contributions or withdrawals or earnings credited toward future Social Security benefits, and on how individuals respond to changing volatility. This project assesses the effect of the volatility of individual and family earnings on asset accumulation and projected retirement wealth using survey data matched to administrative earnings records.

We examine the effect of changing earnings volatility on accumulated net assets at retirement age, including the present discounted value of expected Social Security Old-Age and Survivor's Insurance (OASI) benefits. Several researchers have found large changes in the "transitory variance" or "volatility" of earnings from year to year around a longer-term earnings trajectory. Volatility of own earnings appears to have varied with the business cycle for the last four decades while the volatility of family earnings has risen substantially over time, perhaps doubling over the 1980s and 1990s. Much of this analysis has looked at annual means across individuals, but the impact of this volatility at the individual level may be quite heterogeneous, and for various reasons may have substantial effects on assets at retirement age.

The project addresses the following research questions:

- How does earnings volatility affect the ability to save for retirement?
- How well does the Social Security system insure against earnings volatility?

Earnings volatility may force individuals to save in lower-earning, more liquid accounts in order to smooth consumption over time. Higher volatility may also force more dissavings in any given year, and both of these factors may lead to lower well-being in retirement. On the other hand, individuals may trade off higher mean earnings against increased volatility, so if workers are compensated to some degree for accepting higher risk in earnings by earning greater returns, the impact of increased volatility on wealth is ambiguous. In addition, individuals and families who have higher wealth may be more prepared to take on additional risk in their earnings.

We are also interested in whether Social Security rules protect people's retirement wealth from earnings volatility. For example, the progressive structure of the Social Security replacement rate may smooth differences across individuals or across time in earnings volatility, but wage indexing, incomplete Social Security coverage, and the top-35 rule may have different effects. The taxable maximum in earnings also acts to lower Social Security wealth for some with high earnings volatility, since two years of earnings above and below the taxable maximum by the same amount produce a lower benefit than two years at the taxable maximum. Changing patterns of earnings volatility may have very different effects on Social Security wealth for couples than individuals, because offsetting labor market behavior of husbands and wives may explain some of the increasing family earnings volatility. Further, Social Security provides additional benefits to workers' spouses and survivors at no additional cost, leading to varied patterns of redistribution among couples with different earnings patterns (see, for example, Favreault et al. 2002).

II. Contribution to the literature and policy relevance

Income/earnings volatility refers to changes in an individual's or family's income/earnings over some time interval. Changes can result from a wide range of circumstances, some voluntary and some involuntary, some temporary and some permanent. Negative employment or family shocks, for example reductions in family hours worked (including reduction to zero) because of a plant closing or other job loss, disability, or an unanticipated loss of a spouse (due to divorce or early widowhood) may be the first thing that comes to mind for many when thinking about earnings or income volatility. But volatility also reflects "positive" shocks, like bonuses, raises, or increased overtime pay. It reflects noisiness in economic outcomes because of variation in the cyclical dependence of wages/earnings across occupations and industries (for example, construction workers' and stockbrokers' wages are more volatile than those of government workers or health care technicians) and even within them. It can also reflect key family investments, like the choice to have one spouse forgo paid work for a while to invest in his/her own education or in the care and education of a couple's children.

Several authors have noted the apparent increase in volatility in family income, for example, Gottschalk et al. (1994), Moffitt and Gottschalk (2002), Gosselin (2004, 2008), Hacker (2006), Dynan et al. (2007), and Nichols and Zimmerman (2008). [1] CBO (2007) and CBO (2008) offer a competing perspective, claiming that volatility is largely unchanged since 1980. We address this literature, but move beyond it to examine a potential consequence of volatility for economic well-being in retirement. The insurance value of Social Security is not just insurance against running out of assets in old age, or losing income when a provider dies— OASI can also insure the lifetime income of individuals and families. If much of an observed increase in income volatility were offset by changes in Social Security wealth, and a net rise in income volatility is undesirable, that may argue for not cutting OASI benefits to ensure solvency, unless another form of volatility insurance became available (whose cost would need to be estimated). One recent study considered the effects of negative pre-retirement shocks on retirement wealth (Johnson, Mermin, and Murphy 2007). Because volatility encompasses a far wider spectrum of changes, including positive ones, our question is thus distinct and worthy of independent analysis.

The empirical analysis which comes closest to ours is Mitchell, Phillips, Au, and McCarthy (2007). Mitchell *et al.* use the Health and Retirement Study (HRS) matched to Social Security Administration earnings data to consider the effects of long-term earnings variability (specifically, the coefficient of variation—or ratio of the standard deviation to the mean--for earnings between the 20th and 50th birthdays, with additional analyses looking at the effects in each decade) on various forms of wealth. They test for asymmetric aspects of volatility (analogous to the “negative shocks” concept discussed above). They find that non-married people are more sensitive to volatility than married people and that different types of wealth are associated with volatility in different ways.

While there are many similarities (similar exploration of different wealth variables, disaggregation of households by marital status), our work differs from this prior study in several key ways. First, we supplement HRS data with data from another

[1] Explanations for the change in volatility are wide-ranging, and include globalization of labor and capital markets, the effects of government policy (e.g., declining regulation), declining unionization, changing norms about permissible variation in compensation within firms, increased efficiency of the labor market at rewarding outstanding innovations, high levels of immigration, and other factors

matched survey, enabling us to check robustness and follow cohorts over a longer time period. Second, we focus more on shorter-term volatility. Further, we decompose the effect of volatility into two parts: the level and the change. This allows us to consider the independent effects of changes in the larger economic environment. Finally, we also compare to instrumental variables estimates to evaluate whether observed effects of increased volatility (due to selection, results of choices made by workers, and exogenous factors like labor market conditions) are similar to the causal effects of exogenous shifts in volatility, and find that they are, for the most part.

Our exercise is primarily descriptive and empirical. There is a vast literature on the relationship between earnings uncertainty and volatility and savings that provides an important theoretical context for this work (for example, Hubbard 1985, 1987, Hubbard and Judd 1987, Hubbard, Skinner, and Zeldes 1994, 1995, Parker, Barmby and Belghitar 2005).

III. Methods

We begin by documenting earnings volatility, first computing the estimated variance of earnings within a moving window of years, and then describing how mean and median volatility (measured across individuals) have evolved over time. We also describe how volatility varies across groups, between couples and never married people, and across cohorts. We also compare the distribution of wealth, both total net worth and net housing equity, and Social Security wealth (projected total lifetime benefits payable based on earnings histories). All dollar values are measured in 2000 dollars, deflated by the research series of the Consumer Price Index for all urban consumers.

We calculate volatility as the variability in summed annual earnings of husband and wife, or own earnings for never-married individuals. We use regression analysis to relate Social Security wealth and other wealth to volatility, estimating wealth levels as a function of earnings volatility in one set of models, and the level and change in volatility in another set, conditional on other characteristics. Different components of net worth, including net financial assets and home equity, and Social Security wealth, are the dependent variables in these regressions, and volatility measures are explanatory variables. Social Security wealth is defined at every point in time as the present discounted value (PDV) of the OASDI benefit to be received at modal retirement age, and we measure Social Security wealth for each individual at the last point in time that we observe other assets. Control variables in the analyses include demographic categories such as age, sex, education, and earnings.

IV. Data

We use data from two longitudinal surveys, both of which have been matched to administrative earnings records. The first is the 1990, 1991, 1992, 1993, 1996, and 2004 panels of the Survey of Income and Program Participation (SIPP) matched to Detailed Earnings Records (DER) where available, and Summary Earnings Records (SER) elsewhere, and also to the Master Beneficiary Records (MBR) to supply accurate program participation information. The SIPP represents the non-institutional population and oversamples lower-income households likely to participate in transfer programs. Its panels are relatively short (with a maximum four years in duration), but with frequent interviews (every four months). The second survey is the Health and Retirement Study (HRS) matched to DER and SER data, and the MBR. HRS focuses on older adults approaching retirement age (sampling those aged 51 to 61 in 1992, 1998, and 2004), and oversamples blacks, Hispanics, and Florida residents. Its panels are longer than SIPP's (still on-going, with the original panel now 16 years into the follow-up period), though interviews are less frequent (every two years). We focus on those who are interviewed in the HRS in 1998.[2] We weight all of our estimates and adjust the standard errors for clustering due to the complex sample designs of the two surveys.

The SER, which includes earnings reports from 1951 through the date of most recent data extraction (ranging from 1992 through 2006 in the various surveys we use), reports earnings that the Social Security program covers up through the program's wage and benefit base, also known as the taxable maximum, set at $102,000 in 2008.[3] It thus is

[2] The HRS matches to the administrative data differ from the SIPP match insofar as the SIPP matches are updated regularly (roughly annually), while the HRS match has only been drawn twice, once in 1992 (or 1999 for the War Babies cohort) and then again in 2004 (with data from an additional match based on 2006 permissions forthcoming according to the HRS website). Individuals need to have given permission separately at each point to be included in that match.

[3] Certain sectors of the labor force, including state workers who are covered by state pensions in select states, certain students, and federal workers hired prior to January 1, 1984, are exempt from paying Social

missing the earnings of the highest earners. The fraction of earners whose earnings are capped in the SER has varied historically, reaching a high point of 36.1 percent of covered workers—and nearly half (49.0 percent) of men with covered earnings—in 1965 (Social Security Administration 2008, Table 4.B4). In 2005, about 6.1 percent of covered workers had earnings over the cap. The DER, in contrast, is a more comprehensive earnings measure, including earnings not covered by OASDI and earnings above the taxable maximum. However, DER data are only available from the early 1980s.

Administrative earnings data are generally more accurate than survey data (because of the advantage of systematic record-keeping mechanisms over simple recall and the legal consequences of misreporting). They—particularly the SER—also allow nearly exact computations of the present value of Social Security at a point in time and of the effect of small variations in earnings histories on the value of Social Security. For example, one can measure whether the 36th year of earnings replaces an earlier year in the PIA computations, and assess its contribution to the value of Social Security.

However, administrative earnings data are not a panacea. These records include errors that arise for a variety of reasons (for example, an employer misunderstands the wage reporting form or a clerk improperly keys in data from a handwritten form), and fields that the administrative agency does not use for paying benefits or collecting taxes may not be maintained as reliably as those that are. Probably more importantly, when earnings records are matched to survey data, not all individuals in the sample are matched to a record (typically because they failed to give permission to match their records or they did not provide adequate information, like a valid Social Security number, to permit a match).

Appendix Table 1 presents information on the match rates to the administrative records for the various surveys we use. Match rates for the SIPP data are generally in the range of 60 to 80 percent overall and are close to 90 percent for the key cohorts we examine (except in the 2001 SIPP, where an anomalously low 65 percent match rate leads us to exclude this panel). HRS match rates are lower, hovering closer to 71 percent

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Security taxes. This excluded fraction has shrunk over time (in large part because of changing regulations about who is covered by OASDI), from about 17.5 percent of the civilian labor force in 1955 to about 4.0 percent early this decade (Committee on Ways and Means 2004).

for the cohorts of greatest interest to us. The fractions of individuals who match is not the sole concern—also important is the representativeness of these cases. Validation studies on both HRS and SIPP matches to administrative records suggest that the match rates vary in important ways based on respondent characteristics (for example, Haider and Solon 2000, Kapteyn *et al.* 2006, Czajka *et al.* 2007). In HRS, for example, those who report that they are not working are less likely to offer their Social Security numbers than those with work experience, non-whites are less likely to offer the matching information than whites, and matches are associated with other measures of status, like reported wealth.

In addition to the earnings matches, both surveys include rich information on a variety of other items important for our analyses. SIPP and HRS each include detailed marriage history information, important because of Social Security regulations surrounding marriage duration (e.g., the rule that a marriage that ends in divorce must have lasted at least 10 years in order for an ex-spouse to qualify for spouse or survivor benefits), and for including spousal earnings in calculations of family earnings volatility. In the SIPP, these questions are asked in a topical module that occurs in the second wave of the panel. There are thus selection issues associated with the presence of a marital history (i.e., those who reported a marriage history are non-attriters, and we know that attrition is often correlated with life events—a change in family, schooling, or work status—that are themselves related to earnings volatility). More importantly, we require that married individuals be matched to earnings data on the spouse, and the match rate for spousal records is about 70 to 80 percent for our cohorts (reflecting that not all spouses are in the birth cohorts we examine). Thus the match rate for married survey participants drops to about 90 percent times 80 percent, or close to 70 percent, in the SIPP.

While assets are notoriously difficult to measure, both SIPP and HRS include detailed wealth modules with information on a large number of asset classes.[4] In the HRS, developers implement bracketing techniques to try to improve the quality of the

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[4] In HRS, these classes include checking and savings accounts, Certificates of Deposit (CDs), stocks, bonds, mutual funds, Individual Retirement Accounts (IRAs), and Keogh accounts, money markets, homes, other properties, and business assets less debt, including mortgages. We specifically use the wealth estimates constructed by RAND (St. Clair *et. al* 2008). In SIPP, we use the household aggregates constructed by the Census, including all singly and jointly held assets, less debt, including mortgages.

data and reduce non-response (Juster *et al.* 1999). SIPP uses extensive imputation for individuals providing inadequate information, but evidence suggests that these procedures were problematic in the 1996 panel, and to a less extent in later panels. The problems are greatest for those trying to compute relationships among asset types or changes in assets, where systematic bias may arise. The asset data problems merely introduce noise into the dependent variable in our use of the data. In general, SIPP asset data appear to be limited—especially in terms of capturing the highest percentiles of the distribution. High wealth individuals are underrepresented, and certain categories of wealth such as own business may be undervalued on average. (Smith, Michelmore, and Toder 2008 compare SIPP and HRS wealth estimates with estimates from the Survey of Consumer Finances, the one survey that is geared particularly to the higher wealth holders whose assets comprise the bulk of U.S. wealth.)

The two data sources' sample frames cover different populations, and offer the potential to estimate impacts for numerous birth cohorts. Using the two data sources also allows validity checks, which may be important in estimating individual-level variances, since modeling the second moment is generally more sensitive to data errors and imputation than modeling the conditional mean. We can compare estimates of the same quantities across the data, and the reliability of the methodology may be assessed, to the extent that the sample frames overlap.

We focus on outcomes for the 1943-1949 birth cohorts. Our choice to focus on these cohorts is motivated in part by data limitations. Detailed earnings information on all earnings (including those in uncovered employment and above the taxable maximum) is only available starting in about 1981. We seek to use 10 years of data from these earnings histories, and we would like the earnings data to come from prime age workers in the main, so our cohort of workers should over 40 in 1990 and under 62 in 2004. This limits us to individuals born in 1943 (aged 47 in 1990 and 61 in 2004) to 1949 (aged 41 in 1990 and 55 in 2004). We also compare to adjacent 7-year birth-year cohorts, those born 1936-1942 and those born 1950-1956.

V. Measures

We use three separate dependent variables: net worth (total financial assets less liabilities), housing equity (one component of net worth), and Social Security wealth.[5] Our asset measures include net worth and net housing equity. To illustrate the bounds that result from different assumptions about how wealth is shared within households, we use both a household measure and a per capita measure of net worth. In other regressions not reported here, we also use the cube root of these wealth measures, which produces roughly normal distributions of the dependent variable, eliminating the skewness in wealth. Our qualitative results are unchanged, though the estimated coefficients are more difficult to interpret in those regressions.

Our measure of volatility, VOL, is the year-to-year variability in total earnings reported on Detailed Earnings Records data for the prior five years, i.e. the variance of earnings over five years. It thus reflects short-term, rather than lifetime, volatility. A measure of average volatility is the current volatility (1 year to 5 years ago) plus lagged volatility (variance of earnings 6 years to 10 years ago) divided by two. A measure of individual trend, or difference, in volatility is the current volatility (1 year to 5 years ago) less lagged volatility (variance of earnings 6 years to 10 years ago) divided by two. The average volatility measure, AVOL, and the difference, DVOL, sum to the variable VOL, so if the coefficients on AVOL and DVOL are the same, the interpretation of the coefficient on VOL is straightforward. If not, the average level of and change in volatility may have different impacts on wealth.

Our measure of Social Security wealth takes into account both worker and auxiliary benefits and integrates cohort-sex-specific survival probabilities (for both the individual and his/her spouse where applicable) from the Trustees Report (Board of Trustees 2008).[6] We assume that both workers and their spouses claim benefits at the early eligibility age of 62 and use a discount rate of 2 percent when accumulating

[5] An important limitation of our wealth measure is that we do not include wealth from employer-provided pensions. The Health and Retirement Study data include self-reports on defined contribution pensions and can be linked to detailed pension plan characteristics for those respondents who granted permission that enable researchers to compute both defined benefit and defined contribution pension wealth. The SIPP data include more limited pension information, with no capacity to reflect defined benefit pension wealth.

benefits. A particular complication in computing this measure is that in married couple households, both an individual and his or her spouse need to have been matched to the earnings record in order for us to compute this quantity without imputation.

We include Disability Insurance (DI) beneficiaries in the estimation sample, and compute these individuals' Social Security wealth using disability rules, rather than retirement rules. The choice of whether and how to include these individuals in our analyses is a challenging one. On one hand, policy concern about "increased volatility" typically reflects concern in the fraction of overall risk that workers bear *independent* of disability risk, which a wide variety of social insurance programs address (DI, Supplemental Security Income, Workers' Compensation, and so forth). On the other hand, it is clear that disability application rates vary with economic cycles, though often with a lag (see, for example, Stapleton *et al.* 1998), so it is difficult to disentangle disability and volatility neatly. In future work, we plan to test the sensitivity of our results to this choice to include individuals with disability spells in the sample.

Our explanatory variables include controls for age and education and measures of earnings volatility. We regress wealth on volatility (last 5 years) and then regress wealth on half the change in volatility (last 5 years minus previous 5 years) and half the sum (average 5-year volatility over two periods or ten years). These two predictors sum to the single predictor in the first regression, and have the interpretation of long-run volatility (average volatility or AVOL) and changes/trends in volatility (DVOL). This is similar to the decomposition used by, for example, Baker *et al.* (1999).

For our main cohort of interest (born 1943-1949), mortality differentials are likely to play a small role (more important for men than for women), but systematic variation in wealth and earnings volatility over the life cycle may play a role, so we estimate regressions separately by data source (in each of the SIPP panels, and in the HRS).

VI. Results: Rise in Volatility

We measure volatility at a point in time as the intertemporal variance of earnings using administrative earnings reports from the prior five years. Own earnings offer an

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[6] When computing Social Security benefits under this strategy, we forward fill an individual's earnings trajectory with zeros. This is consistent with Social Security law. Further, we do not implement the

incomplete measure of economic income, and thus a distorted picture of volatility, but own and spouse earnings constitute most of family income and therefore the variance of summed own and spouse earnings represent the volatility in family income we wish to measure better (see also Nichols and Zimmerman 2008 on own earnings versus family income).

Figure 1a demonstrates that mean family earnings volatility has increased over the period 1990 to 2004, but the trend in mean own earnings volatility is less clear. Though each panel's subsample represents roughly the same population,[7] those born 1936-1954, the own earnings volatility estimates are surprisingly noisy relative to family earnings volatility. The upward trend in volatility is driven by increasing levels above the median. Trends in the 75th percentile of family earnings volatility look very much like trends in the mean (Figure 1b), whereas trends in the median exhibit no secular trend, but do exhibit cyclical patterns. Trends in mean own earnings volatility are driven by large variation at higher percentiles of the distribution.

Retirement Earnings Test (RET).

[7] These repeated national surveys would represent the same population except for two factors: changes due to immigration and mortality, and changes due to changing family structure (some who are never married in 1993 will be married in 1996, and some who are married in 1993 will no longer be matched to spouses, or matched to different spouses in 1996). The projections of future earnings volatility for families in years after the survey assume that family structure remains constant (estimates of past earnings volatility before the start of the survey takes account of the beginning dates of marriage, but cannot account for the contribution of previous spouses). Only in Figures 1 and 2 do these projections of future earnings volatility play a role; elsewhere in the paper only earnings volatility over the ten years preceding the survey is measured.

Figure 1a. Mean family and own earnings volatility by year, by SIPP Panel

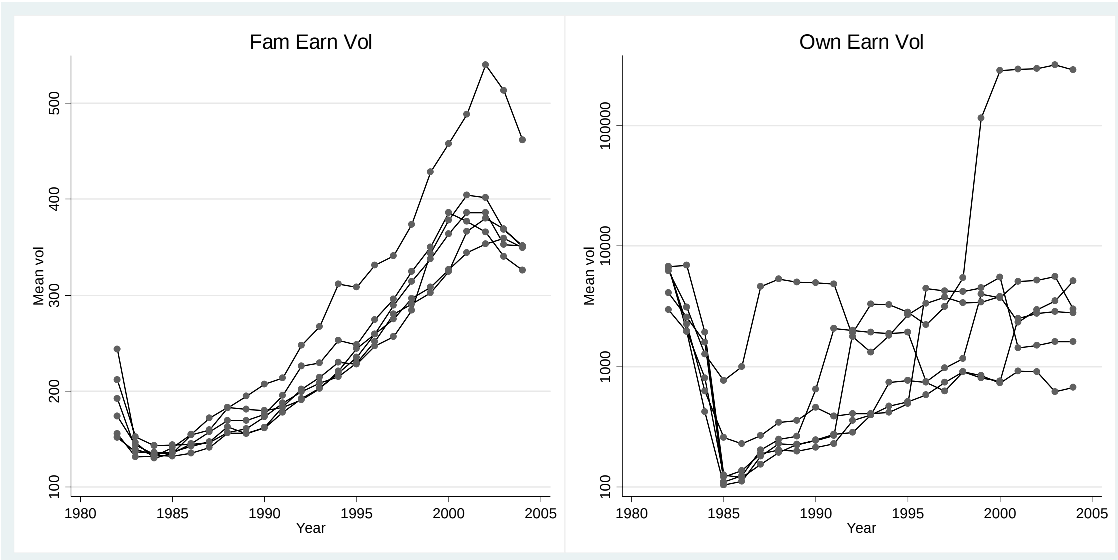
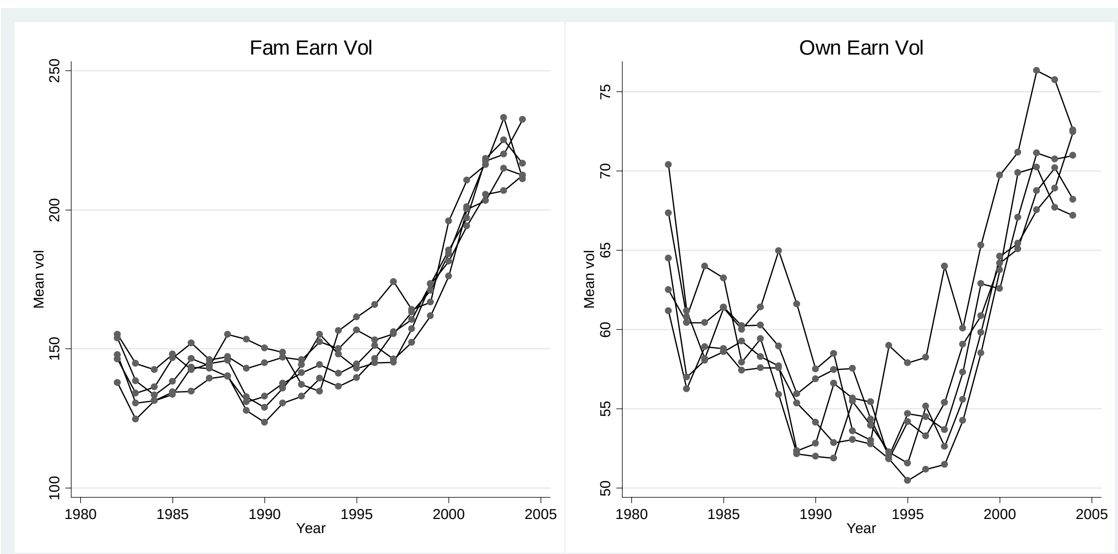


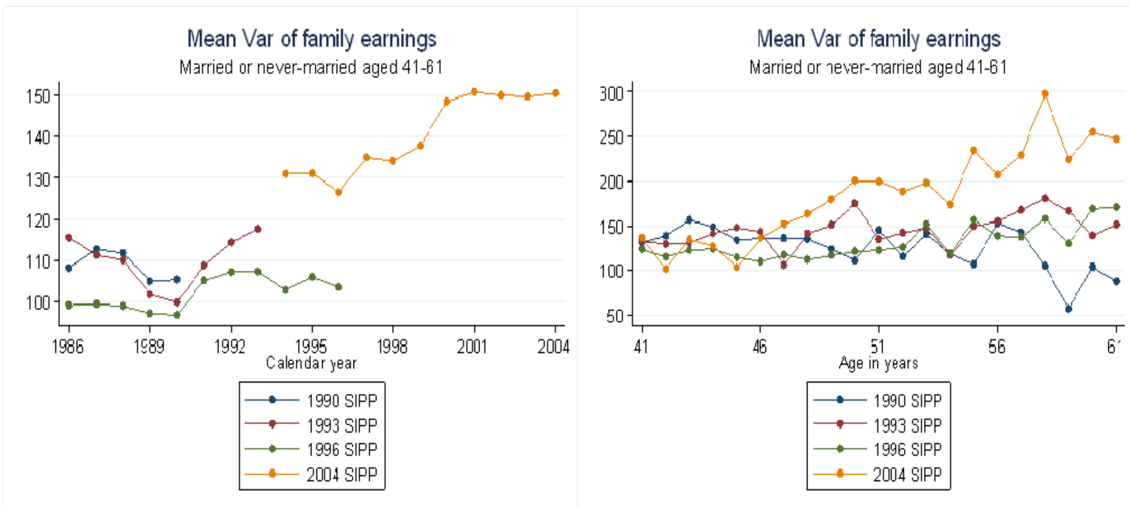
Figure 1b. 75th Percentile of family and own earnings volatility by year, by SIPP Panel



Note: only birth cohorts 1936-1956 are included in calculations; volatility is measured in millions of year-2000 dollars; top one percent of volatility cases in each year are dropped before calculating means; weights are normalized to average one within each panel.

Since the population of those born in 1936-1954 is aging over these years, it is natural to wonder whether the apparent increase in volatility is due to older workers having more volatile incomes. Figure 2 shows that the aging of these cohorts plays a small role, but likely does not drive the observed upward trend. The 2004 survey does produce markedly different estimates from the 1996 survey, however, so it is not clear what role changes in surveys or changes in the underlying population may play in explaining the upward trend in volatility in these cohorts. In the rest of our analysis, we exploit cross-sectional variation in volatility, so any failure of identification of trends does not affect our results.

Figure 2. Mean family earnings volatility by year and age, by SIPP Panel



VII. Results: Wealth Distributions

The distribution of household net worth has shifted to the right over time and become more dispersed for all cohorts we examine, and each cohort experiences a shift in location and spread as it ages. That is, both the mean and variance of wealth increase with age and increase with time for a given age group. However, the distributions are broadly similar, as shown in the following graphs (Figures 3a through 3c), and we estimate separate regressions within panel to ascertain whether the pattern of the association between wealth and earnings volatility has changed over time as our target population ages.

Figure 3a. Distribution of household net worth by panel, 1936-1956 birth cohorts (censored above $3million)

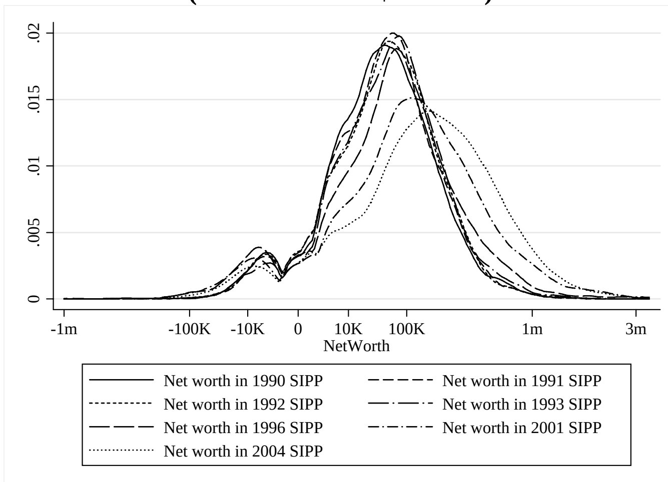


Figure 3b. Distribution of household net worth by birth cohorts, 1990 SIPP (censored above $3million)

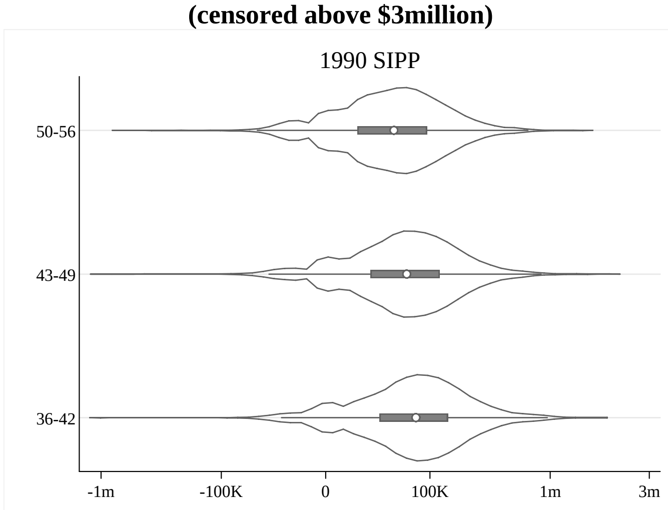
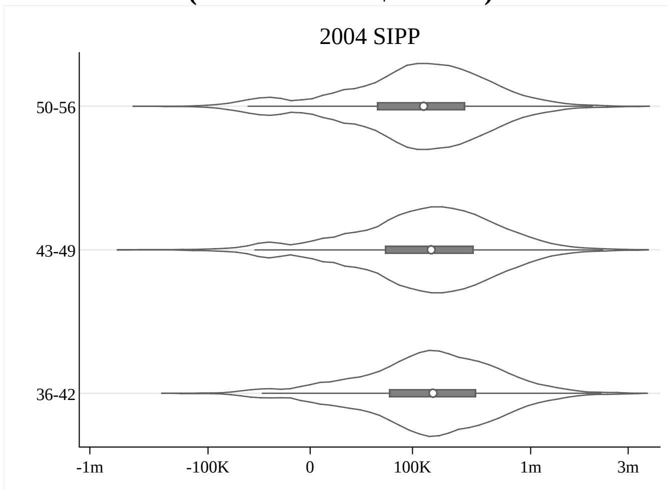


Figure 3c. Distribution of household net worth by birth cohorts, 2004 SIPP (censored above $3million)



The distribution of per person household net worth has also shifted to the right and increased in variance over time, both within and across cohorts, but exhibits much lower dispersion than household net worth (Figures 4a through 4c).

Figure 4a. Distribution of per-capita household net worth by SIPP panel, 1936-1956 birth cohorts

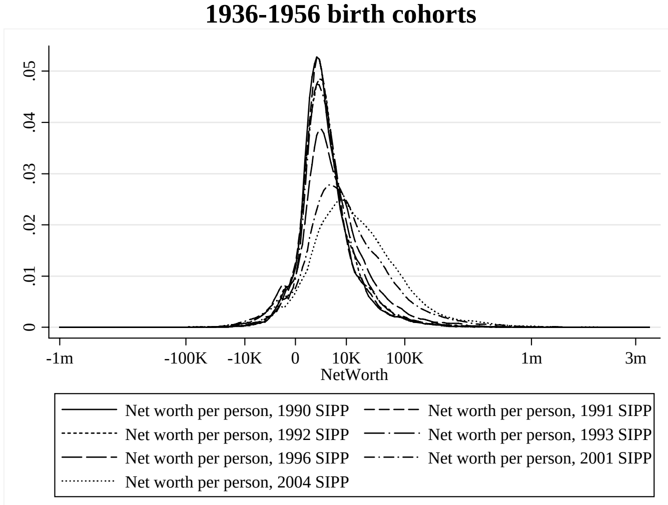


Figure 4b. Distribution of per-capita household net worth by birth cohorts, 1990 SIPP

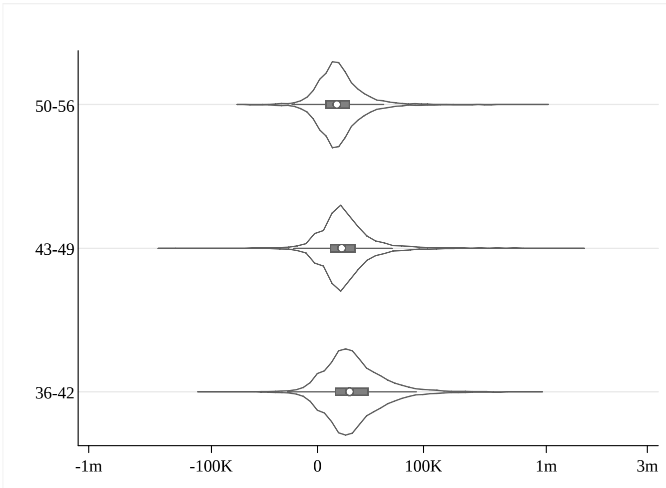
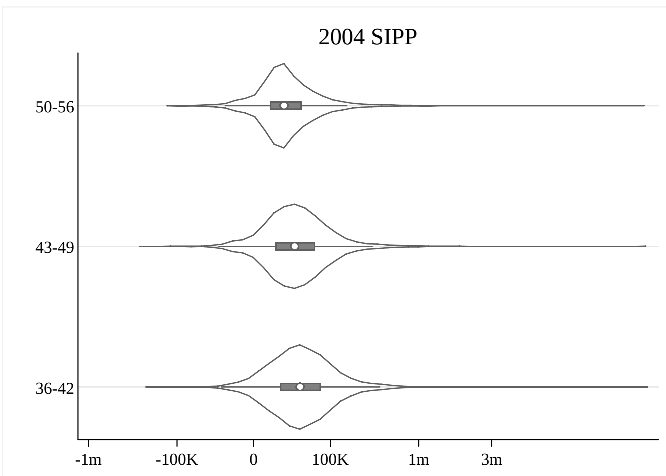


Figure 4c. Distribution of per-capita household net worth by birth cohorts, 2004 SIPP



VIII. Results: Regressions of wealth on earnings volatility measures

The regressions of household net worth (Table 1), household net worth per person (Table 2), housing equity (Table 3), Social Security wealth (Table 4), and the sum of household net worth per person and Social Security wealth (Table 5) are presented in the tables below (focusing on the combined SIPP estimates) and in Appendix B (the estimates from the HRS). We juxtapose results for men and women combined (version A of each table) with those for men alone (version B). Estimates reproducing the regressions below in each SIPP panel are not qualitatively different from the pooled survey results.

The coefficient estimates suggest that higher volatility is associated with higher wealth in most categories for married people. An increase of 1 unit in earnings volatility (measured in millions of squared dollars) is associated with a $30 higher net worth among married individuals (Table 1A, column 3) or $29 among married men (Table 1B, column 3). Such an increase in volatility corresponds to a thought experiment where an individual's earnings are constant in real terms over five years, but one year he or she has a one-time shock of $2000. We can think of this as a rough estimate of the marginal propensity to save (on net, ignoring consumption that one could finance through borrowing) being in the one and one half percent range.

Decomposing the apparent effect of volatility into effects due to short-run and long-run volatility components, or the effects of average volatility and changes in volatility, suggests that the association is driven entirely by long-run average volatility. This may be due to heterogeneity in the population, with less risk-averse types more willing to accept volatile earnings streams and earning higher average returns, or it may be due to precautionary savings on the part of those who expect higher future volatility.

Results for never married people sometimes show a reverse pattern, where higher volatility is associated with lower wealth, but results for this subgroup are imprecisely estimated and not statistically significant.

Table 1. Dependent Variable Total Net Worth, All SIPP Panels

A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-36110.3	-37261.8	-9080.0	-5739.8
	(-1.03)	(-1.06)	(-0.58)	(-0.34)
Age sq.	468.7	478.3	201.1	165.7
	(1.15)	(1.18)	(1.21)	(0.94)
Educ<12th grade	-60549.0***	-59471.3***	-108270.1***	-106654.7***
	(-4.83)	(-4.96)	(-4.09)	(-3.56)
Educ>12th grade	-32346.6**	-30163.1**	-75342.4***	-72868.6**
	(-2.87)	(-2.62)	(-3.40)	(-2.96)
1990 Panel	105023.0	101547.8	-94329.9	-101641.4
	(1.04)	(1.00)	(-1.24)	(-1.24)
1991 Panel	86449.7	86307.5	-116448.9	-122222.0
	(0.88)	(0.88)	(-1.53)	(-1.48)
1992 Panel	97479.7	94952.5	-113045.6	-121114.1
	(1.01)	(0.98)	(-1.46)	(-1.45)
1993 Panel	99265.0	97555.8	-103619.8	-108247.6
	(1.08)	(1.05)	(-1.32)	(-1.27)
1996 Panel	105979.8	105299.2	-114255.2	-124512.5
	(1.05)	(1.04)	(-1.42)	(-1.44)
Female	-23405.0	-21719.2	-6228.2	-7191.4
	(-1.64)	(-1.48)	(-0.27)	(-0.30)
Avg Earnings	2.014**	1.870**	1.364***	1.307***
	(2.92)	(2.67)	(5.11)	(4.33)
Earnings Var	-4.389		30.48***	
	(-0.14)		(4.27)	
Diff Earnings Var		-87.57		-2.823
		(-1.61)		(-0.22)
Avg Earnings Var		54.44		57.88***
		(1.06)		(4.43)
Constant	671119.2	701666.2	217140.1	145434.7
	(0.95)	(1.00)	(0.62)	(0.40)
Observations	1645	1645	14585	13600

B. Men Only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	-81665.3	-77479.7	23880.2	26830.5
	(-1.26)	(-1.16)	(1.17)	(1.16)
Age sq.	997.4	944.8	-162.2	-192.5
	(1.32)	(1.21)	(-0.76)	(-0.82)
Educ<12th grade	-81204.7***	-77101.8***	-129770.3*	-130553.7*
	(-4.14)	(-3.94)	(-2.50)	(-2.23)
Educ>12th grade	-30377.8	-24540.0	-103279.1*	-103769.8*
	(-1.65)	(-1.23)	(-2.19)	(-1.99)
1990 Panel	254876.2	233241.6	-225960.4	-237821.9
	(1.38)	(1.21)	(-1.62)	(-1.58)
1991 Panel	214232.1	201239.1	-247408.8	-256938.0
	(1.18)	(1.08)	(-1.77)	(-1.69)
1992 Panel	242386.8	223007.5	-247589.0	-260814.7
	(1.37)	(1.21)	(-1.73)	(-1.69)
1993 Panel	236866.5	217985.2	-236609.4	-247765.9
	(1.38)	(1.21)	(-1.63)	(-1.57)
1996 Panel	266218.6	251920.8	-235948.4	-254690.7
	(1.33)	(1.22)	(-1.56)	(-1.56)
Avg Earnings	2.244	1.917	1.104*	1.050
	(1.81)	(1.49)	(2.23)	(1.82)
Earnings Var	-37.72		28.83***	
	(-0.55)		(3.68)	
Diff Earnings Var		-191.3*		12.02
		(-2.29)		(0.85)
Avg Earnings Var		79.63		44.95**
		(0.70)		(3.16)
Constant	1479557.6	1412316.9	-386620.8	-444410.6
	(1.19)	(1.11)	(-0.88)	(-0.95)
Observations	763	763	7294	6792

Notes: NM=never-married, Mar=married
t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2. Dependent Variable Per capita Household Net Worth, All SIPP Panels
A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-31626.8	-32402.2	-9571.8	-8884.4
	(-1.00)	(-1.03)	(-1.33)	(-1.16)
Age sq.	413.5	420.0	159.0^{*}	151.6
	(1.10)	(1.12)	(2.07)	(1.86)
Educ<12th grade	-42514.3^{***}	-41788.7^{***}	-41528.6^{**}	-40711.8^{**}
	(-5.34)	(-5.57)	(-3.17)	(-2.76)
Educ>12th grade	-31830.6^{***}	-30360.3^{***}	-26992.7^{*}	-25656.0^{*}
	(-3.80)	(-3.51)	(-2.45)	(-2.11)
1990 Panel	93854.7	91514.6	-48349.0	-51493.0
	(0.96)	(0.93)	(-1.29)	(-1.27)
1991 Panel	89432.2	89336.5	-55365.9	-57677.5
	(0.93)	(0.93)	(-1.47)	(-1.41)
1992 Panel	92622.4	90920.7	-53543.8	-56932.5
	(0.99)	(0.96)	(-1.40)	(-1.38)
1993 Panel	94810.5	93659.6	-52037.7	-54365.4
	(1.05)	(1.04)	(-1.34)	(-1.29)
1996 Panel	99371.7	98913.4	-54847.6	-59508.7
	(1.00)	(0.99)	(-1.38)	(-1.38)
Female	-20465.9	-19330.7	-2385.3	-2666.6
	(-1.57)	(-1.43)	(-0.21)	(-0.22)
Avg Earnings	1.865^{**}	1.768^{**}	0.418^{***}	0.388^{**}
	(3.06)	(2.73)	(3.51)	(2.92)
Earnings Var	-15.23		13.47^{***}	
	(-0.54)		(4.02)	
Diff Earnings Var		-71.24^{*}		1.670
		(-2.00)		(0.30)
Avg Earnings Var		24.38		23.28^{***}
		(0.51)		(3.79)
Constant	548523.5	569092.5	196002.6	182676.7
	(0.92)	(0.96)	(1.23)	(1.13)
Observations	1645	1645	14585	13600

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	-63920.2	-61532.1	-604.4	153.2
	(-1.07)	(-1.00)	(-0.07)	(0.01)
Age sq.	815.9	785.9	58.43	50.80
	(1.14)	(1.06)	(0.61)	(0.47)
Educ<12th grade	-61557.7***	-59216.8***	-51749.9*	-51956.5
	(-4.08)	(-3.84)	(-1.99)	(-1.78)
Educ>12th grade	-35992.4*	-32661.7*	-39847.3	-39866.8
	(-2.48)	(-2.03)	(-1.69)	(-1.53)
1990 Panel	238691.2	226347.6	-103553.1	-109141.5
	(1.32)	(1.20)	(-1.51)	(-1.46)
1991 Panel	215764.1	208351.0	-110288.3	-115070.8
	(1.21)	(1.13)	(-1.60)	(-1.52)
1992 Panel	227629.3	216572.6	-109686.8	-116012.1
	(1.31)	(1.20)	(-1.55)	(-1.50)
1993 Panel	229030.0	218257.4	-107577.9	-113347.4
	(1.35)	(1.24)	(-1.50)	(-1.44)
1996 Panel	251272.2	243114.7	-106895.8	-116440.9
	(1.26)	(1.19)	(-1.42)	(-1.42)
Avg Earnings	2.173	1.986	0.296	0.260
	(1.91)	(1.58)	(1.22)	(0.93)
Earnings Var	-46.09		12.59***	
	(-0.71)		(3.37)	
Diff Earnings Var		-133.7*		8.703
		(-2.43)		(1.45)
Avg Earnings Var		20.87		17.28*
		(0.18)		(2.56)
Constant	1021904.4	983540.4	57080.1	45245.9
	(0.93)	(0.87)	(0.30)	(0.22)
Observations	763	763	7294	6792

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3. Dependent Variable Home Equity, All SIPP Panels
A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	848.9	463.5	-3341.4	-1744.1
	(0.07)	(0.04)	(-0.63)	(-0.32)
Age sq.	-1.704	1.535	60.95	44.23
	(-0.01)	(0.01)	(1.08)	(0.77)
Educ<12th grade	-23880.2***	-23519.6***	-26292.0***	-25999.3***
	(-4.70)	(-4.67)	(-9.97)	(-9.32)
Educ>12th grade	-9817.3*	-9086.6	-15261.6***	-14996.8***
	(-2.10)	(-1.94)	(-8.31)	(-7.74)
1990 Panel	-24178.9	-25341.8	-16380.4	-18132.8
	(-1.41)	(-1.52)	(-1.79)	(-1.96)
1991 Panel	-18434.0	-18481.6	-16903.2	-17744.5
	(-1.06)	(-1.09)	(-1.86)	(-1.92)
1992 Panel	-19835.9	-20681.6	-18050.1*	-18888.0*
	(-1.19)	(-1.28)	(-2.00)	(-2.07)
1993 Panel	-13730.2	-14302.1	-19018.4*	-19627.7*
	(-0.84)	(-0.90)	(-2.15)	(-2.20)
1996 Panel	-3961.2	-4188.9	-23011.2**	-23833.0**
	(-0.28)	(-0.31)	(-2.83)	(-2.90)
Female	-2565.1	-2000.9	5853.7***	5660.8***
	(-0.66)	(-0.52)	(6.44)	(6.11)
Avg Earnings	0.443***	0.395***	0.458***	0.462***
	(4.35)	(3.94)	(13.15)	(12.50)
Earnings Var	10.08		4.812**	
	(1.15)		(2.67)	
Diff Earnings Var		-17.76		-2.890
		(-1.20)		(-0.77)
Avg Earnings Var		29.76**		10.00***
		(2.59)		(3.56)
Constant	24672.2	34894.2	85604.9	48748.0
	(0.09)	(0.13)	(0.71)	(0.39)
Observations	1645	1645	14585	13600

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	1668.0	2546.3	6920.4	7082.7
	(0.09)	(0.14)	(1.00)	(1.00)
Age sq.	-10.73	-21.78	-55.38	-57.36
	(-0.06)	(-0.12)	(-0.76)	(-0.77)
Educ<12th grade	-26515.7***	-25654.7***	-24681.1***	-24138.4***
	(-3.43)	(-3.32)	(-7.80)	(-7.29)
Educ>12th grade	-3268.1	-2043.1	-14858.9***	-14652.0***
	(-0.44)	(-0.27)	(-6.34)	(-6.05)
1990 Panel	-20677.2	-25216.9	-33808.4**	-35660.3**
	(-0.79)	(-0.97)	(-3.01)	(-3.08)
1991 Panel	-12753.2	-15479.6	-36842.5**	-36916.8**
	(-0.46)	(-0.57)	(-3.28)	(-3.18)
1992 Panel	-11843.6	-15910.0	-36736.6***	-37327.0**
	(-0.46)	(-0.62)	(-3.32)	(-3.27)
1993 Panel	-10830.9	-14792.8	-37617.8***	-38047.9***
	(-0.42)	(-0.58)	(-3.47)	(-3.41)
1996 Panel	3930.1	930.0	-38981.1***	-39294.0***
	(0.17)	(0.04)	(-3.96)	(-3.88)
Avg Earnings	0.265	0.196	0.483***	0.500***
	(1.77)	(1.37)	(11.89)	(12.32)
Earnings Var	15.60		3.937	
	(1.00)		(1.90)	
Diff Earnings Var		-16.62		-3.098
		(-0.72)		(-0.67)
Avg Earnings Var		40.23*		8.362*
		(2.21)		(2.44)
Constant	1608.0	-12501.4	-116577.2	-119916.4
	(0.00)	(-0.03)	(-0.75)	(-0.75)
Observations	763	763	7294	6792

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Dependent variable Social Security wealth, all SIPP panels
A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-14568.6	-14568.0	-8759.1**	-9507.7***
	(-1.65)	(-1.65)	(-3.24)	(-3.42)
Age sq.	162.7	162.7	118.0***	125.8***
	(1.72)	(1.72)	(4.07)	(4.23)
Educ<12th grade	-33295.5***	-33296.1***	-12063.5***	-11434.9***
	(-7.86)	(-7.88)	(-7.75)	(-7.15)
Educ>12th grade	-8663.2**	-8664.4**	-2294.6**	-1876.5*
	(-2.87)	(-2.89)	(-2.88)	(-2.30)
1990 Panel	-40746.8**	-40744.9**	-44017.8***	-43775.4***
	(-3.01)	(-3.01)	(-10.37)	(-10.06)
1991 Panel	-31186.1*	-31186.0*	-40074.9***	-39671.6***
	(-2.26)	(-2.26)	(-9.33)	(-9.00)
1992 Panel	-27636.0*	-27634.5*	-37331.4***	-36483.9***
	(-2.03)	(-2.03)	(-8.73)	(-8.32)
1993 Panel	-25788.4	-25787.4	-28950.4***	-28382.7***
	(-1.91)	(-1.90)	(-6.83)	(-6.53)
1996 Panel	-16256.2	-16255.7	-22989.9***	-22564.3***
	(-1.33)	(-1.33)	(-5.97)	(-5.70)
Female	5444.0*	5443.0*	-32908.8***	-33883.2***
	(2.28)	(2.26)	(-40.73)	(-40.77)
Avg Earnings	0.585***	0.586***	0.270***	0.291***
	(6.79)	(6.45)	(18.80)	(20.18)
Earnings Var	-1.447		-2.769***	
	(-0.29)		(-4.70)	
Diff Earnings Var		-1.401		-1.884
		(-0.13)		(-1.93)
Avg Earnings Var		-1.479		-3.986***
		(-0.20)		(-4.07)
Constant	405346.8*	405331.7*	314392.3***	332056.5***
	(2.07)	(2.07)	(5.23)	(5.38)
Observations	1609	1609	14366	13397

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	-15164.9	-15054.4	-16105.8***	-16726.5***
	(-1.30)	(-1.29)	(-3.49)	(-3.57)
Age sq.	173.8	172.4	204.1***	210.1***
	(1.39)	(1.38)	(4.12)	(4.19)
Educ<12th grade	-24410.6***	-24319.3***	-7496.6**	-6951.0**
	(-4.15)	(-4.13)	(-2.97)	(-2.67)
Educ>12th grade	-4359.1	-4232.1	2744.5*	3025.3*
	(-1.06)	(-1.03)	(2.08)	(2.19)
1990 Panel	-31807.2	-32316.0	-41809.4***	-42708.6***
	(-1.68)	(-1.70)	(-5.66)	(-5.58)
1991 Panel	-17863.5	-18182.9	-37127.5***	-37963.1***
	(-0.91)	(-0.93)	(-4.96)	(-4.88)
1992 Panel	-16853.6	-17311.0	-34443.8***	-34811.8***
	(-0.88)	(-0.90)	(-4.61)	(-4.50)
1993 Panel	-18757.6	-19205.6	-24668.5***	-25346.2**
	(-0.99)	(-1.01)	(-3.32)	(-3.30)
1996 Panel	-14964.6	-15309.7	-19968.2**	-20498.3**
	(-0.85)	(-0.87)	(-2.97)	(-2.94)
Avg Earnings	0.521***	0.514***	0.252***	0.261***
	(5.61)	(5.36)	(13.02)	(12.62)
Earnings Var	-7.459		-0.216	
	(-1.26)		(-0.25)	
Diff Earnings Var		-10.82		-2.455
		(-0.89)		(-1.81)
Avg Earnings Var		-4.902		1.202
		(-0.68)		(0.94)
Constant	406923.8	405058.7	429395.9***	445384.4***
	(1.57)	(1.57)	(4.21)	(4.31)
Observations	740	740	7178	6684

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. Dependent variable Total per-capita Household Net Worth and Social Security Wealth, all SIPP Panels

A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-45222.6	-45907.6	-17309.5*	-18041.6*
	(-1.30)	(-1.33)	(-2.14)	(-2.12)
Age sq.	566.9	572.5	266.1**	273.7**
	(1.38)	(1.40)	(3.08)	(3.02)
Educ<12th grade	-74478.2***	-73762.9***	-53005.6***	-51455.5***
	(-7.31)	(-7.62)	(-4.04)	(-3.51)
Educ>12th grade	-40331.5***	-38886.0***	-29272.7**	-27606.8*
	(-4.32)	(-4.09)	(-2.62)	(-2.24)
1990 Panel	51389.9	49021.2	-96644.9*	-98424.4*
	(0.50)	(0.48)	(-2.42)	(-2.31)
1991 Panel	57447.5	57254.9	-99721.7*	-100555.2*
	(0.57)	(0.57)	(-2.49)	(-2.34)
1992 Panel	63588.3	61816.8	-95201.6*	-96589.2*
	(0.65)	(0.63)	(-2.35)	(-2.23)
1993 Panel	67869.3	66633.6	-85388.5*	-86022.1
	(0.72)	(0.70)	(-2.08)	(-1.95)
1996 Panel	81754.2	81208.7	-82146.8	-85335.2
	(0.79)	(0.78)	(-1.95)	(-1.89)
Female	-15661.0	-14495.9	-35217.7**	-36571.9**
	(-1.17)	(-1.05)	(-3.04)	(-2.98)
Avg Earnings	2.454***	2.357***	0.676***	0.669***
	(3.88)	(3.50)	(5.51)	(4.98)
Earnings Var	-17.14		10.74**	
	(-0.57)		(3.13)	
Diff Earnings Var		-72.71		0.469
		(-1.81)		(0.08)
Avg Earnings Var		22.13		18.92**
		(0.45)		(3.03)
Constant	930806.2	949320.7	491463.3**	510300.3**
	(1.39)	(1.43)	(2.78)	(2.84)
Observations	1609	1609	14366	13397

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	-79961.7	-76957.9	-14652.6	-14693.2
	(-1.22)	(-1.13)	(-1.33)	(-1.20)
Age sq.	1002.5	965.6	240.8*	240.9
	(1.29)	(1.20)	(2.08)	(1.91)
Educ<12th grade	-84327.2***	-81844.9***	-59411.5*	-59017.5*
	(-4.87)	(-4.70)	(-2.28)	(-2.03)
Educ>12th grade	-39914.8*	-36461.8*	-37405.2	-37116.6
	(-2.53)	(-2.11)	(-1.56)	(-1.40)
1990 Panel	212297.7	198466.1	-151512.3*	-158233.7*
	(1.12)	(1.00)	(-2.08)	(-1.99)
1991 Panel	203923.5	195241.8	-153360.2*	-159329.6*
	(1.08)	(1.00)	(-2.09)	(-1.99)
1992 Panel	215914.6	203478.8	-150278.1*	-157206.4
	(1.17)	(1.06)	(-2.01)	(-1.93)
1993 Panel	215954.3	203775.6	-138494.6	-145227.8
	(1.20)	(1.09)	(-1.82)	(-1.75)
1996 Panel	240768.3	231386.5	-132873.7	-143155.8
	(1.15)	(1.07)	(-1.68)	(-1.66)
Avg Earnings	2.704*	2.509	0.531*	0.506
	(2.33)	(1.95)	(2.14)	(1.79)
Earnings Var	-54.14		12.15**	
	(-0.81)		(3.16)	
Diff Earnings Var		-145.5*		7.410
		(-2.48)		(1.21)
Avg Earnings Var		15.36		17.29*
		(0.13)		(2.53)
Constant	1435808.1	1385105.2	445508.8	454365.3
	(1.18)	(1.11)	(1.92)	(1.87)
Observations	740	740	7178	6684

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The variance of earnings is highly skewed, and not independent of scale (so that correctly adjusting for inflation is a concern), but results not presented here using the standard deviation of earnings (the square root of variance), or the cube root of variance (which is more nearly normally distributed), or the coefficient of variation, produce qualitatively similar results. The distributions of dependent variables such as net worth are also highly skewed, and the distribution of residuals does not appear to be normal, but additional results not presented here using various transformations of the dependent variables also produce qualitatively similar results.

In additional estimates not presented here, we used an instrumental variables strategy to assess the impact on wealth of exogenous variation in earnings volatility due to state labor market conditions, and find similar results (in terms of sign and significance). Specifically, we instrument earnings volatility with different frequency components of variation in state unemployment rates over the prior year and a long-run difference and moving average over a five-year period prior to the survey. These instruments pass the usual tests of the validity of overidentification restrictions, absence of underidentification, and weak instruments (using a limited-information maximum likelihood approach due to the many excluded instruments) for regressions of wealth on earnings volatility. Specifications including both the moving average of earnings volatility and the first difference, however, do not pass the underidentification test, so we suspect that we can only identify exogenous movements in average volatility.

IX. Conclusions

As policymakers try to address Social Security's unfunded obligation, now estimated at $4.3 trillion over the 75-year projection horizon (Board of Trustees 2008), they should bear in mind the multiple roles that the program plays for American workers. The structure (e.g. progressive replacement rates) of Social Security provides insurance for lifetime income. However, we find that the impact of short-run earnings volatility on Social Security wealth is largely inconsequential.

At the same time, higher average levels of earnings volatility are associated with higher financial wealth and increases in earnings volatility are associated with lower financial wealth, suggesting precautionary saving and spend down of assets. Social Security seems to have a negligible insurance value with respect to earnings volatility, and even the small effects volatility has on Social Security wealth are often in the wrong direction to provide insurance, as higher earnings volatility is associated with lower Social Security wealth.

Neither average levels of earnings volatility nor increases in earnings volatility are randomly distributed in the population, so we cannot treat these associations as causal. Nevertheless, the impacts of earnings volatility on wealth measures in an instrumental variables approach are very similar to the point estimates presented here, suggesting that the bias from using observational data on households is not leading us to make incorrect inferences. Unfortunately, we cannot use that instrumental variables strategy to estimate the independent impacts of both short-run and long-run changes in volatility.

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Appendix A

Table A1.
Percent Matched Rates, Survey data matched to Administrative Earnings Data, (Unweighted rates in parentheses)

	Overall match rate for adults born between 1935 and 1956*	Match rate for focal group, 1943-1949* birth cohorts	Match rate spouses of individuals in 1943-1949 cohorts, among married persons
1990 SIPP	93 (92)	93 (93)	81(80)
1991 SIPP	90 (90)	90 (90)	79 (79)
1992 SIPP	90 (90)	91 (91)	78 (78)
1993 SIPP	89 (90)	89 (89)	77 (77)
1996 SIPP	87 (87)	87 (87)	74 (74)
2001 SIPP	65 (65)	67 (67)	58 (57)
2004 SIPP	88 (88)	87 (88)	72 (72)
1998 HRS	78 (80)	71 (72)	64 (64)

Source: Authors' calculations from the surveys matched to SER.
Notes: SIPP=Survey of Income and Program Participation; HRS= Health and Retirement Study. Detailed Earnings Records match rates are typically within a fraction of a percentage point of the Summary Earnings Record match rates.
* In the 1998 HRS sample, cohorts born in the 1931-1947 range only.
HRS includes both 2004 permissions administrative matches and initial match.

Appendix B. Health and Retirement Study Regression Results

Appendix Table B1. 1998 HRS, Dependent Variable Household net worth

A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-453164.4	-621240.2	878686.2	1034304.9
	(-0.35)	(-0.49)	(1.05)	(1.22)
Age squared	3983.8	5564.0	-8114.1	-9624.2
	(0.33)	(0.47)	(-1.01)	(-1.19)
Educ<12th grade	-75329.2	-79309.7	-65232.8	-88468.4
	(-1.51)	(-1.50)	(-1.40)	(-1.94)
Educ>12th grade	87087.3	79721.9	135867.7*	99641.6*
	(1.14)	(1.03)	(2.37)	(2.12)
Female	-100311.1	-106135.1	92791.3	57040.9
	(-1.19)	(-1.25)	(1.83)	(1.21)
Average earnings	-0.663	-1.436	3.126**	1.381
	(-0.60)	(-0.64)	(2.91)	(1.41)
Earnings Var	779.2*		28.74	
	(2.65)		(0.70)	
Diff Earn Var		559.1*		-259.4
		(2.26)		(-1.84)
Avg Earn Var		851.8		301.0**
		(1.57)		(2.68)
Constant	12959104.5	17433212.0	-23704933.0	-27646860.3
	(0.38)	(0.52)	(-1.07)	(-1.24)
Observations	75	75	460	460

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	346607.8	-937178.6	514879.4	523424.0
	(0.28)	(-0.81)	(0.47)	(0.47)
Age squared	-3607.3	8577.6	-4681.0	-4826.7
	(-0.30)	(0.79)	(-0.45)	(-0.45)
Educ<12th grade	-83132.8	-53264.2	-68289.1	-72095.1
	(-1.23)	(-1.31)	(-1.02)	(-1.11)
Educ>12th grade	19261.0	43220.1	186232.6*	138680.5*
	(0.21)	(0.59)	(2.28)	(2.19)
Average earnings	-3.094	-2.677	2.844*	1.018
	(-1.73)	(-1.24)	(2.03)	(0.79)
Earnings Var	-96.99		21.89	
	(-0.70)		(0.55)	
Diff Earn Var		-3263.7		-292.5
		(-1.44)		(-1.82)
Avg Earn Var		-1715.8		321.0*
		(-1.35)		(2.46)
Constant	-8122604.1	25639423.2	-13988046.3	-14009509.2
	(-0.25)	(0.84)	(-0.49)	(-0.48)
Observations	45	45	339	339

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table B2. 1998 HRS, Dependent Variable Per-capita Household net worth

A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-234753.6	-306906.1	282570.7	338948.6
	(-0.29)	(-0.38)	(0.76)	(0.90)
Age squared	2055.9	2734.2	-2535.7	-3082.8
	(0.26)	(0.36)	(-0.72)	(-0.86)
Educ<12th grade	-50512.2	-52221.0	-38378.2	-46796.1*
	(-2.01)	(-1.97)	(-1.85)	(-2.23)
Educ>12th grade	78023.7	74861.8	47879.9	34755.9
	(1.92)	(1.78)	(1.85)	(1.57)
Female	-36872.1	-39372.2	51384.1**	38432.4*
	(-0.97)	(-1.04)	(2.63)	(2.01)
Average earnings	-0.693	-1.025	1.145*	0.513
	(-0.99)	(-0.85)	(2.34)	(0.95)
Earnings Var	356.5		17.10	
	(1.89)		(1.05)	
Diff Earn Var		262.1		-87.30
		(1.71)		(-1.53)
Avg Earn Var		387.7		115.7*
		(1.25)		(2.37)
Constant	6738984.5	8659652.4	-7824900.9	-9252991.2
	(0.31)	(0.41)	(-0.81)	(-0.94)
Observations	75	75	460	460

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	219460.7	-417886.0	96595.6	99776.8
	(0.25)	(-0.42)	(0.19)	(0.19)
Age squared	-2328.2	3721.1	-756.9	-811.2
	(-0.28)	(0.40)	(-0.15)	(-0.16)
Educ<12th grade	-43298.1	-28469.6	-49123.8	-50540.7
	(-1.14)	(-1.02)	(-1.73)	(-1.83)
Educ>12th grade	73329.1	85223.8	68000.4	50296.8
	(1.04)	(1.29)	(1.76)	(1.57)
Average earnings	-3.186	-2.979	0.922	0.243
	(-1.83)	(-1.62)	(1.50)	(0.36)
Earnings Var	-194.3		16.67	
	(-1.51)		(1.05)	
Diff Earn Var		-1766.4		-100.4
		(-1.60)		(-1.59)
Avg Earn Var		-998.0		128.0*
		(-1.60)		(2.30)
Constant	-5026284.8	11735161.4	-2912793.4	-2920784.0
	(-0.22)	(0.45)	(-0.22)	(-0.21)
Observations	45	45	339	339

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table B3. 1998 HRS, Dependent Variable Household net housing equity

A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-322292.1	-275915.2	162247.3	190937.7
	(-0.74)	(-0.69)	(0.67)	(0.81)
Age squared	3133.1	2697.1	-1524.1	-1802.5
	(0.76)	(0.71)	(-0.67)	(-0.80)
Educ<12th grade	-28717.6^{*}	-27619.2^{*}	-383.5	-4667.3
	(-2.34)	(-2.16)	(-0.03)	(-0.31)
Educ>12th grade	39318.8^{*}	41351.1^{*}	42382.4^{**}	35703.6^{*}
	(2.21)	(2.19)	(2.88)	(2.50)
Female	3857.0	5464.0	13496.8	6905.7
	(0.21)	(0.30)	(1.19)	(0.60)
Average earnings	0.231	0.444	0.873^{*}	0.551
	(0.97)	(1.02)	(2.55)	(1.90)
Earnings Var	64.66		16.30^{*}	
	(0.76)		(2.43)	
Diff Earn Var		125.4^{*}		-36.83
		(2.64)		(-1.47)
Avg Earn Var		44.60		66.50^{**}
		(0.53)		(3.30)
Constant	8312986.7	7078451.9	-4249614.8	-4976364.2
	(0.73)	(0.67)	(-0.67)	(-0.80)
Observations	75	75	460	460

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	-351914.9	-319481.8	411546.5	412767.4
	(-0.75)	(-0.64)	(1.45)	(1.45)
Age squared	3398.5	3090.7	-3915.1	-3935.9
	(0.75)	(0.65)	(-1.45)	(-1.46)
Educ<12th grade	-27758.3	-28512.9	2435.1	1891.2
	(-1.56)	(-1.56)	(0.15)	(0.11)
Educ>12th grade	38939.4	38334.1	53658.5^{***}	46864.0^{***}
	(1.32)	(1.29)	(3.70)	(3.53)
Average earnings	-0.0966	-0.107	0.721^{*}	0.460
	(-0.13)	(-0.14)	(2.17)	(1.53)
Earnings Var	-210.9		17.42^{*}	
	(-1.73)		(2.48)	
Diff Earn Var		-130.9		-27.51
		(-0.26)		(-1.04)
Avg Earn Var		-170.0		60.16^{**}
		(-0.61)		(2.87)
Constant	9145771.6	8292821.0	-10726324.1	-10729390.9
	(0.74)	(0.63)	(-1.44)	(-1.44)
Observations	45	45	339	339

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table B4. 1998 HRS, Dependent Variable Social Security Wealth

A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-287095.3	-298251.3	111988.4	113240.9
	(-1.10)	(-1.09)	(1.26)	(1.28)
Age squared	2796.2	2901.1	-1031.3	-1043.3
	(1.12)	(1.12)	(-1.22)	(-1.24)
Educ<12th grade	-44060.5*	-44301.6*	-16964.3**	-17050.2**
	(-2.51)	(-2.51)	(-3.28)	(-3.29)
Educ>12th grade	4907.2	4452.5	-8634.6*	-8790.8*
	(0.44)	(0.40)	(-2.13)	(-2.18)
Female	6022.9	5678.7	-12555.7*	-12698.7*
	(0.60)	(0.56)	(-2.58)	(-2.56)
Average earnings	0.301***	0.257	0.313***	0.306***
	(3.52)	(1.57)	(5.68)	(5.18)
Earnings Var	75.18*		-2.277*	
	(2.41)		(-2.01)	
Diff Earn Var		62.73*		-3.401
		(2.25)		(-0.88)
Avg Earn Var		79.27*		-1.215
		(2.30)		(-0.32)
Constant	7431171.6	7727951.7	-2934242.1	-2966672.7
	(1.08)	(1.08)	(-1.25)	(-1.27)
Observations	72	72	451	451

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	-91524.0	-191336.4	13092.4	17135.3
	(-0.31)	(-0.54)	(0.20)	(0.26)
Age squared	955.4	1901.9	-107.8	-146.8
	(0.34)	(0.56)	(-0.17)	(-0.23)
Educ<12th grade	-32865.9	-31260.4	-17013.6***	-17057.5***
	(-1.32)	(-1.21)	(-3.72)	(-3.73)
Educ>12th grade	27638.5	28697.5	-3211.3	-3898.0
	(1.53)	(1.56)	(-0.79)	(-0.95)
Average earnings	0.430	0.462	0.249***	0.225***
	(1.43)	(1.41)	(5.36)	(4.43)
Earnings Var	77.01		-2.097**	
	(1.36)		(-3.13)	
Diff Earn Var		-111.5		-6.276**
		(-0.69)		(-2.75)
Avg Earn Var		-19.47		1.876
		(-0.21)		(0.77)
Constant	2232661.7	4860631.4	-300838.3	-405200.0
	(0.29)	(0.52)	(-0.17)	(-0.23)
Observations	42	42	336	336

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table B5. 1998 HRS, Dependent Variable Net Worth plus Social Security Wealth

A. All

	(1) NM1	(2) NM2	(3) Mar1	(4) Mar2
Age	-762128.5	-856652.2	410186.5	526269.4
	(-0.67)	(-0.77)	(0.97)	(1.21)
Age squared	7143.7	8032.7	-3715.0	-4826.3
	(0.66)	(0.76)	(-0.92)	(-1.17)
Educ<12th grade	-98901.5**	-100943.9**	-56595.1*	-64551.1**
	(-3.15)	(-3.07)	(-2.51)	(-2.81)
Educ>12th grade	82693.1	78840.6	43377.3	28898.3
	(1.83)	(1.68)	(1.55)	(1.19)
Female	-27199.3	-30115.6	37326.1	24075.4
	(-0.65)	(-0.72)	(1.74)	(1.12)
Average earnings	-0.404	-0.771	1.447**	0.814
	(-0.60)	(-0.68)	(2.84)	(1.45)
Earnings Var	431.7*		15.04	
	(2.44)		(0.88)	
Diff Earn Var		326.3		-89.14
		(1.97)		(-1.52)
Avg Earn Var		466.4		113.5*
		(1.60)		(2.25)
Constant	20465339.1	22979920.7	-11169811.0	-14175708.4
	(0.68)	(0.78)	(-1.01)	(-1.25)
Observations	72	72	451	451

B. Men only

	(1) MaleNM1	(2) MaleNM2	(3) MaleMar1	(4) MaleMar2
Age	-58831.4	-1049751.0	-10607.8	105723.5
	(-0.05)	(-0.63)	(-0.02)	(0.18)
Age squared	436.0	9832.7	265.9	-856.2
	(0.04)	(0.63)	(0.05)	(-0.15)
Educ<12th grade	-81220.3	-65281.9	-65898.9*	-67161.6*
	(-1.66)	(-1.58)	(-2.28)	(-2.38)
Educ>12th grade	106891.2	117404.4	69656.6	49897.0
	(1.27)	(1.50)	(1.71)	(1.47)
Average earnings	-2.800	-2.486	1.151	0.457
	(-1.49)	(-1.23)	(1.83)	(0.67)
Earnings Var	-143.9		14.78	
	(-0.87)		(0.90)	
Diff Earn Var		-2015.5		-105.5
		(-1.71)		(-1.65)
Avg Earn Var		-1101.8		129.1*
		(-1.68)		(2.30)
Constant	2025522.9	28115547.9	-16294.3	-3019259.6
	(0.06)	(0.64)	(-0.00)	(-0.19)
Observations	42	42	336	336

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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