

Unpublished Appendix:
Data Description for
“Do the Rich Save More?”
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by

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I. CEX Data

We used data from Nelson's (1994a) reorganization of the CEX, which provides expenditure, income, and demographic information for a cross-section of households. The extract contains the 1980-89 waves, but we excluded the first two years because of concerns about data quality. We were left with a sample of households whose final interviews fell between the first quarter of 1982 and the final quarter of 1989.

The CEX is conducted on a quarterly basis. Nelson aggregated the expenditure information so that each household's data correspond to spending for the full year of participation. The demographic information (and income information) in the Nelson data set generally pertain to each household's final survey. See Nelson (1994a) for a detailed discussion of her data extracts as well as the limitations of the CEX data.

A. Deflating

All expenditure and income variables were deflated using the NIPA implicit price deflator for personal consumption expenditures (as published in March 2002), adjusted to have a base year of 1994.

B. Constructed Variables

1. *Consumption.* We defined consumption as total household expenditures plus imputed rent for homeowners minus mortgage payments, expenditures on home capital improvements, life insurance payments, and spending on new and used vehicles. The measure is similar to the National Income and Product Accounts concept, except that it excludes purchases of new cars and life insurance payments and includes property tax payments. Also note that medical care consumption equals only out-of-pocket spending (less reimbursements).

2. *After-tax Income.* Following Nelson, gross (pre-tax) income equals the sum of workman's compensation, veteran's benefits, dividends, royalties, estate and trust income, pension and annuities, welfare and public assistance, food stamps, interest on savings accounts and bonds, net income or loss from boarders, net income or loss from other rental units, alimony or child support, other money income, salary income, nonfarm business income, farm income, Social Security and railroad retirement income, and supplemental security income. The figures correspond to the 12 months preceding each household's final interview.

After-tax income equals gross income minus taxes paid (federal, state and local, personal property and other taxes, net of refunds). Nelson cautions that the tax data are even less reliable than the income data.

The after-tax income of fewer than 1 percent of the households in Nelson's extract was topcoded, with one or more of the underlying components of income exceeding \$75,000 (if the final interview occurred before the end of 1982) or \$100,000 (if the final interview occurred later). We included these cases in our

sample, setting nominal after-tax income to the topcoding cut-offs.

3. *Saving Rate*. The saving rate equals the difference between real after-tax income and real consumption, all divided by real after-tax income.

4. *Age*. The age variable pertains to the male head of household if present; otherwise it pertains to the female head of household.

5. *Education*. The education variables are based on the number of years of education reported by the male head of household if present; otherwise, those reported by the female head. Households were put in the "no high school degree" group, the "high school degree only" group, or the "college degree" group, depending on whether the head reported less than twelve years of schooling, at least twelve but less than sixteen years of schooling, or at least sixteen years of schooling, respectively.

C. Weights

The CEX includes probability weights in the quarterly samples, but Nelson (1994a, Section V) warns that "When using observations from a period other than a calendar quarter (or after having subjected the observations to demographic or data quality selection criteria), use of these weights is not clearly justifiable. Most household-level analysis will ignore these weights". Accordingly, we do not use the CEX weights.

D. Sample Selection

After excluding the early waves from Nelson's reorganization, we were left with 32606 households. We then eliminated 10670 households whose heads were less than 30 years old, between 60 and 69 years old, or over 79 years old. We next dropped 3156 households whose members did not participate in the complete set of surveys. We then removed 419 households for whom some key expenditure data were missing, 2163 households whose income data were coded as unreliable, 170 households whose real after-tax income was less than \$1000 and 4 households for whom real after-tax income was missing. (Often missing data was simply entered in the survey as a zero, see Nelson, 1994a). We were left with 13,054 households in our working-age (ages 30-59) sample and 2970 households in our older (ages 70-79) sample.

II. SCF Data

We use data from the 1983-89 SCF panel. Households were interviewed about their assets and liabilities, employment, income, and demographics in 1983 and then

again in 1989. Respondents fall into one of two groups: the area-probability sample, which was designed to provide good coverage of assets and liabilities that are broadly distributed in the population, and the "list" sample, which was compiled from IRS tax records and designed to provide estimates of assets and liabilities held by relatively wealthy households. Our analysis includes both groups so we were able to obtain relatively precise estimates for households at the top of the income distribution.

A. Deflating

All wealth and income variables were deflated using the NIPA implicit price deflator for personal consumption expenditures (published as of March 2002), adjusted to have a base year of 1994.

B. Constructed Variables

1. *Net Worth.* Net worth equals the value of checking accounts, savings accounts, certificates of deposit, savings bonds, money market accounts, cash/call money accounts, trusts, life insurance (cash value), homes, land contracts, other real estate, vehicles, thrift plans, IRAs, stocks, bonds, loans owed to the household, business assets, and "other" financial and nonfinancial assets, minus the value of credit card debt, lines of credit debt, vehicle debt, mortgage debt, other real estate debt, consumer debt, business debt, and "other" debt.

2. *Income.* Household income equals the sum of wages and salaries, net business income, income from non-taxable investments, other interest income, dividends, capital gains from the sale of stocks, bonds or real estate, rental income, trust income, royalties, unemployment insurance, worker's compensation, child support, alimony, income from AFDC, SSI and other forms of assistance, Social Security income, other pension income, and "other" income. The SCF contains no information about taxes paid.

3. *Saving Rate.* The (annualized) saving rate equals real net worth in 1989 less real net worth in 1983, all divided by six times the average of 1982 and 1988 real income.

4. *Age.* The age variable pertains to the age of the "head" of household in 1986. In the SCF, the head is defined as the respondent (selected as the person "most knowledgeable" about household financial affairs) unless the respondent was female and had a male spouse present in the household. In this case, the "head" is defined as the respondent's spouse.

5. *Education.* All education groupings were done according to the number of years of education reported by the head in 1989. Households were put in the "no

high school degree" group, the "high school degree only" group, or the "college degree" group, depending on whether the head reported less than twelve years of schooling, at least twelve but less than sixteen years of schooling, or at least sixteen years of schooling, respectively.

C. Weights

All calculations were weighted with the variable WGT0296, which was developed explicitly for the purpose of estimating changes in wealth between 1983 and 1989.

D. Sample Selection

The SCF panel data set contains information from 1479 households. The data set has 4437 observations because each household's data was repeated 3 times with noise added to any imputed variables, in order to more accurately represent the variance of these imputed variables. We excluded 1260 observations (i.e. information about 420 households) because the heads were younger than 30, between the ages of 60 and 69, or over 79. We then eliminated another 522 observations (i.e. information about 174 households) because the head or spouse had changed between the 1983 and 1989 interviews. Finally, we removed 9 observations (i.e. information about 3 households) because their incomes in 1982 or 1988 were less than \$1000. We were left with 2184 observations with information from 728 households in our working-age (ages 30-59) sample and 462 observations with information from 154 households in our older (ages 70-79) sample.

In order to correct our standard errors for the presence of the replicates in the data set, we multiplied them by 1.73 – the square root of the number of replicates (3).

III. PSID Data

We use family/individual data from the PSID from 1968-99. We also use the 1989 and 1994 active saving and wealth supplements. We describe in detail below the construction of variables needed for the 1984 -1989 estimation period. Unless otherwise noted, the same methodology is used to construct variables for the 1989-1994 estimation period.

A. Deflating

All variables except the food consumption variables and the active saving variable are deflated using the NIPA implicit price deflator for personal consumption expenditures (as published in March 2002), adjusted to have a base year of 1994. We deflate food consumed at home and food consumed out of the home with the CPI-U's for food consumed at home and for food consumed out of the home, both adjusted to have a base year of 1994. The CPI's correspond to the first quarter of the relevant year, as we assume that households base their responses on current food consumption (as opposed to that in the previous year).

B. Constructed Variables

1. *Saving*. We construct four measures of saving: the change in wealth, active saving, the change in wealth plus pension (and Social Security) saving, and active saving plus pension (and Social Security) saving. All of the wealth and active saving components (except the house and mortgage values) are from the wealth and active saving supplement files constructed by the PSID staff, which give detailed information on wealth levels in 1984, 1989, and 1994, and components of active saving for 1984-89 and 1989-94.¹ The house and mortgage values are from the relevant yearly family files.

a) *Change in wealth*. This variable equals the difference between real net worth in 1984 and real net worth in 1989, where net worth includes the value of checking and savings accounts, money market funds, CDs, government saving bonds, T-bills, and IRAs; the net value of: stocks, bonds, rights in a trust or estate, cash value of life insurance, valuable collections, and other assets; the value of main house, net value of other real estate, net value of farm or business, and net value of vehicles; *minus* the remaining mortgage principal on main home and other debts. Net worth does not include either defined benefit or defined contribution pension wealth. Imputation procedures were used by the PSID staff when respondents failed to provide an estimate of a wealth component or when they could only provide a range of values.

b) *Active saving*. The “active saving” variable is constructed using the PSID methodology and data from the active saving supplement. It is equal to the change in wealth (1984 to 1989), adjusted for passive increases or decreases in wealth (such as capital gains). However, capital gains questions were not directly asked, so the measure is built in part from questions about saving flows.

Specifically, we begin with the definition of active saving in the PSID 1989 codebook (V17610) which is based on 1984 and 1989 family/individual file data, replace variable names with the newer versions in the supplemental wealth and active saving files, and then rewrite the definition to delete entries that are both added and subtracted, to get:

nominal active saving =

+ the value of private annuities purchased since 1984 (viann_89)
- the value of private annuities or pensions cashed in since 1984
(voann_89)

¹ The PSID recommends that researchers use these revised data, which have been cleaned more carefully and contain improved imputations. In an earlier draft of this paper (Dynan, Skinner, and Zeldes, 2000), we used the more preliminary data obtained directly from the 1989 family file, and also made no correction for inflation (see below).

- + the cost of additions or improvements to all real estate since 1984 (vhimp_89)
- + the value of real estate (other than main home) purchased since 1984 (vbrel_89)
- the value of real estate (other than main home) sold since 1984 (vsrel_89)
- + the amount invested in business or farm since 1984 (vbbus_89)
- the value of farm or business sold since 1984 (vsbus_89)
- + net amount invested into stocks since 1984 (vstoc_89)
- + the value of assets less debts removed by movers out of the family unit since 1984 (voass_89 - vodeb_89)
- the value of assets less debts added by movers into the family unit since 1984 (viass_89 - videb_89)
- + the value of vehicles in 1989 (s213)
- the value of vehicles in 1984 (s113)
- + the value of cash assets in 1989 (s205)
- the value of cash assets in 1984 (s105)
- + the net value of other assets in 1989 (s215)
- the net value of other assets in 1984 (s115)
- + the remaining mortgage principle in 1984 (v10020)
- the remaining mortgage principle in 1989 (v16326)
- + the value of other debt in 1984 (s107)
- the value of other debt in 1989 (s207).
- inheritances or gifts received since 1984 (vinha_89+vinhb_89).
- + change in value of primary home during years in which the family moved.

The last term is an adjustment for families that moved. If the family did not move between two surveys, then the change in house value between those surveys is a capital gain and excluded from active saving. However, if a family did move between surveys, the change in house value between those surveys (due, for example, to selling a smaller house and buying a larger house) is included as part of active saving and excluded from capital gains. Following the methodology of Juster, Lupton, Smith, and

Stafford (2001), the dummy for whether a household moved between surveys was corrected for data contradictions as follows. If a head indicated they hadn't moved during the prior year, yet they switched their own/rent status between consecutive years, we forced the move dummy to one (213 observations). Or if someone was a renter yet listed a value of a house, we set the house value and mortgage to zero (one observation.)

We also follow the above authors in our approach to adjusting the active saving measure for inflation. We start with the definition (above) of nominal active saving, and then deflate each of the components as follows. For the flow saving variables, we deflate the nominal variables using the (harmonic) average of the price level over the relevant five years. For the change-in-stock variables (house value, mortgage, and wealth variables), we deflate the nominal level in each year by the price index for that year, and then take the change in this real value. The result is the real active saving measure used in the paper.

c) *Social Security and pension saving.*

Social Security saving:

We begin with Feldstein and Samwick's (1992) imputation methods for determining what fraction of Social Security payroll contributions can be considered saving. Along the three relevant segments of the AIME schedule, they calculated Social Security net marginal tax rates, equal to the payroll tax minus the present discounted value (using a 4% real discount rate) of marginal benefits. Net marginal tax rates were calculated at each age for single women, single men, and couples, and were corrected for average life expectancy and spousal benefits. (We are especially grateful to Andrew Samwick, who provided us with detailed tables of these net tax rates.) In some cases the Social Security net marginal tax rate is positive (the 11.2 cent payroll tax yielded an increase in the present value of benefits less than 11.2 cents) and in some cases it is negative (i.e. the 11.2 cent payroll tax yielded an increase in the present value of benefits greater than 11.2 cents).

Assigning single households to the appropriate group is straightforward (single males, single females). For couples the problem is more complex, since couples may benefit more by receiving spousal benefits rather than gaining credit for a lower-paid spouse's individual contributions. Thus we use earnings of the highest paid spouse (male or female) when the lower-paid spouse earned less than 40 percent of the higher-paid spouse.

We construct social-security-eligible earnings by excluding earnings above the taxable limit in any of the 5 years 1984-89. We then average these eligible earnings across the five years. Next, we integrate the Feldstein and Samwick net marginal tax rates along the AIME schedule to measure the Social Security net **average** tax rate for the specific

household. Dollars of Social Security saving equals 11.2 percent minus the net average tax rate, multiplied by eligible earnings. Households that pay a net average tax have Social Security saving less than 11.2 percent of earnings, while households that receive a subsidy, (e.g. some lower income households, that are accumulating largely along the first, 90 percent AIME schedule) have Social Security saving greater than 11.2 percent of earnings. We add this Social Security saving to the reported PSID saving.

Pension saving:

Finally, we consider the imputation of pension benefits. The PSID asks about employee contributions toward defined contribution plans. We start with the answer to: “On the average, what amount or percent of pay have you contributed over the last five years since 1984?” and multiply this by average labor income from 1984-1988 to get a dollar amount of saving. We do this for the contributions to all defined contribution pension plans with the current employer (exclusive of IRAs, which are included elsewhere) for both the head and spouse. If a household answered that they contributed to a DC plan, but did not report the percent, we set the percent equal to 5.5. We do not include contributions from previous jobs held during this period because of concerns about double counting of contributions and because we don’t know the length of the period of contributions (test results that included these contributions did not materially differ from those reported). We have no data on employer contributions to defined contribution plans.

Defined benefit plans are more complicated, since there are often quite complex accumulation rules. However, Gustman and Steinmeier (1989) used the detailed pension information from the 1983 SCF Pension Provider Supplement to calculate the implicit returns to average DB plans at that time. While they did not report implicit contribution rates by income group, they did provide such rates by age group. For PSID households that indicated that they have a DB plan, we use their calculations to add to our measure of saving accumulation in defined benefit plans (see their Table 13 on page 85). Implicit accumulation rates range from less than 6 percent of labor income before age 35 to 18 percent (briefly) around age 50 back to 5 percent prior to retirement.

2. *Disposable Income.* Disposable income is constructed by subtracting Federal taxes paid by the head and wife and Federal taxes paid by other members of the family unit from total family money income. Total family money income is the sum of taxable income of the head and wife, taxable income of other members of the family unit, transfers of the head and wife, and transfers of other members of the family unit. Taxes paid are estimated by the PSID staff based on taxable income, number of dependents and exemptions, filing status, estimated standard and itemized deductions, estimated earned income tax credits, and estimated

elderly tax credits. All nominal components of disposable income are deflated using the implicit price deflator described above. Average disposable income is calculated for 1984-88 (1985-89 survey years). We calculate an additional measure of average disposable income to use with the broader saving measure described above. This measure starts with the above measure of disposable income and adds 1) one half of Social Security saving to average disposable income (1984-88), to correct for the fact that the employer contribution to Social Security is not measured in the conventional definition of income, but is measured as part of our augmented Social Security saving, and 2) the imputed employer-contribution to defined benefit and/or defined contribution plans, for the same reason.

For the 1989-94 period, we faced the complication that the PSID stopped determining taxes paid in 1991. To calculate Federal taxes owed for calendar years 1991 and 1992, TAXSIM, available through www.nber.org was used (with PSID variables as inputs). Because the PSID data for calendar year 1993 (survey year 1994) were only available in early release form (with some variables missing), we assumed each family had the same tax rate for 1993 as 1992.

3. *Saving Rates.* We calculate the saving rates by dividing active saving and the change in wealth by five times average disposable income from 1984-88. Our broader saving measures are divided by five times the corresponding average disposable income measure.

4. *Consumption.*

The PSID does not include information on overall consumption. Instead, we use two measures of consumption: food consumption, and weighted consumption.

Food consumption: We follow Zeldes (1989) in the construction of food consumption. In survey years 1977-87 and 1990-92, the question on food consumed at home was designed to exclude the amount saved from food stamps. To measure total annual food consumed at home we add the annual food consumed at home constructed by the PSID staff and (when appropriate) the annual amount saved from food stamps. This variable is deflated by the home food consumption deflator described above. Annual food consumed out of the home is deflated by the appropriate measure for food consumed out of the home. Total real annual food consumption is the sum of total real annual food consumed at home and annual real food consumed out of the home.

Since questions on food consumption were omitted from the survey in 1988 and 1989, we use food consumption in 1984, 1985, 1986, and 1987 as our instruments.

Weighted consumption: As described in the text, we calculate the measure using weights from Bernheim et. al. (2001), so that $C^{\text{weighted}} = 1.930$ (Food at home) + 2.928 (Food away from home) + 1.828 (Rental payments if renter) + 0.1374 (value of house if homeowner).

5. *Education.* We consider education of the head in 1989 only. The sample is divided into 3 education categories: no high school degree, high school degree only, and college degree. Observations are coded “no high school degree” if they have 0-11 years of schooling and they have not received a high school degree. Observations holding a high school degree, a high school degree and non-academic training, or a high school degree and some college attendance (but no college degree) are coded “high school degree only”. Finally observations holding a college degree or a college degree plus advanced training are coded “college degree”.

6. *Lagged Earnings*

Individual years: We correct for taxes on labor income as follows. We calculate the average tax rate equal to taxes paid by head and spouse divided by taxable income of head and spouse. After-tax labor income of the head and spouse is equal to pre-tax labor income multiplied by (1 minus the average tax rate) plus transfers of the head and spouse. We also ensure that we only include lagged earnings as instruments for households whose head-spouse combination is the same across the relevant years (see below).

Ten-year plus average lagged earnings: This measure is equal to the sum of the averages of real after-tax earnings of the head and of the spouse (if present) during all their available working years (age 62 and below), back to 1967 when possible. For each head, we construct a dummy for each year indicating whether the head was 63 years old or younger at the time of the survey (making them 62 years or younger at the same date in the previous year, i.e. the year the labor income was being earned). For example, labor income in 1980 was asked about in the survey conducted in 1981. The dummy equals one if the head was 63 or younger at the time of the survey (Spring 1981), which would make them 62 or younger in Spring 1980. We take present value (as of 1990) of each real after-tax labor income by multiplying by (1.03) to the appropriate power. We then average these values across all observations (through 1983 for Table 7, and through 1988 for Table 9) with the dummy variable equal to 1.

For the spouse, the dummy variable equals 1 for any given year if: a) the head-spouse combination is the same as in the 1984-89 period (this is calculated recursively starting in 1983 and ending in 1967, using the change in family composition variable for each year) and b) the head’s dummy = 1 for that year (see above). The same procedure as above is then used to calculate average real after-tax labor income of the spouse.

Finally, the variable used in the regressions is the sum of the head and spouse averages. For the estimates based on this average, we restrict the sample to those with at least 10 observations included in the head’s average and at least 5 observations included in the spouse’s average. This variable is set to missing if there are less than 10 observations included in the head’s average or less than 5 observations included in the spouse’s average. (Note that zero values are included in the averages and count as observations).

7. *Future Earnings.* We calculate after-tax future earnings by the same method described above for lagged earnings. Specifically, after-tax labor income of the head and spouse is equal to pre-tax labor income multiplied by (1 minus the average tax rate) plus transfers of the head and spouse. To ensure that the head-spouse combination is the same throughout the period in which we calculate future earnings (1989-91), we set after-tax earnings to missing if in a given (future) year the head-spouse combination is not the same as in the previous year. In this case, we care about whether the head-spouse combination is the same going forward from 1988, rather than backward (as with lagged earnings).

8. Change in family composition: Households were excluded during the 1984-89 or 1989-94 period if there were changes in either the head or the spouse during the period.

C. Weights

All quintiles for the 1984-89 results were calculated using the 1989 family weights from the PSID (V17612). The quintiles for the 1989-94 results used the 1994 family weights.

D. Sample Selection

We use the 1968-99 family-individual file from the PSID, and each individual constitutes an observation. For the 1984-89 results, the sample selection was as follows. We restrict the sample to households that had the same head in all years from 1984 to 1989 and who had no change in family composition affecting the head over that period (5180 remaining observations). We drop households that didn't tell us if they had moved during any year from 1983-88 (24 dropped). We then drop households whose head was less than 30 years old in 1987 (757 dropped). For all but Table 7, we drop households whose head was older than 59 in 1987 (1125 dropped) and households whose head-spouse combination changed over the 1984-89 period (348 dropped). We then drop households whose total real after-tax money income in any year from 1984-88 was less than \$1000 in 1994 dollars (for a total of 66 dropped), and households with the absolute value of active saving above \$750,000 in 1994 dollars (6 observations dropped). The sample is restricted further in that we drop observations whose income or education measure used in the one and two stage regressions is missing. In the one stage regression using current income quintiles, no observations are dropped. In the one stage education regression, 14 observations are dropped. In the two stage regression using food consumption as an instrument, 61 observations are dropped. In the two stage regressions using lagged and future income (separately) as instruments, 1495 and 383 observations are dropped, respectively.

For Table 7, we delete the household whose head is younger than 62 in 1987. We then have 992 total observations. We then drop observations of which the family composition between 1984 and 1989 has been changed (49 observations dropped). Then we drop those who were working during the 1984-89 period (304 dropped.) We

also drop households whose total real money income in any year 1984-88 was less than \$1000 (3 dropped) and households who had an absolute value of active saving greater than \$750,000 (0 dropped). Then, in the education regressions we drop observations whose education level is missing (6 dropped). Finally, when we run the regression on average earnings, we dropped the observations with missing values of ten-year plus average earnings (374 dropped).

For table 8, we keep only those observations with heads between age 30 and 59 (4284 left). Then we drop observations with missing values for saving or disposable income in either period (790 dropped for change in wealth / 1814 dropped for active saving) or a major family composition change between 1984 and 1989 (246 / 358 dropped). We also drop households whose total real disposable income in any year between 1984 and 1993 was less than \$1000 (202 / 138 dropped) and households who had an absolute value of the change in saving greater than \$750,000 or the absolute value of the change in income greater than \$100,000 (27 / 18 dropped). This leaves us with 2907 observations for the change in wealth measure of saving and 2068 observations for the active saving measure.

For Table 9, we begin with the sample in Table 3 (2854 observations). We delete 2137 observations whose age in 1989 is below 51 or over 61, leaving 717 observations. For the regression using the 10-year plus earnings measure, we lose 40 additional observations with an insufficiently long earnings history for either the head or spouse.

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