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HOUSEHOLD SAVING IN THE U.S.

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In this paper the authors present evidence on household saving in the U.S. based on the panel data from the 1983 and 1986 waves of the Survey of Consumer Finances. Saving is measured in these surveys as the change in wealth over the three-year period. Using a variety of models, we are able to explain only about 7 percent of the variation in the level of saving. Demographic factors appear to be modestly useful in explaining saving. However, one fact is very clear from the patterns of correlation extracted so far: either the measurement error in the data is quite large, or idiosyncratic factors are very important in explaining saving behavior, or both.

I. INTRODUCTION

In this paper, we use data from the 1983 and 1986 waves of the Survey of Consumer Finances (SCF) to examine the saving behavior of U.S. households. Although identifying the determinants of household wealth accumulation is one of the most important current research and policy questions, until recently there has been very little high-quality household-level wealth information for the U.S. Microdata on saving are even rarer. Prior to the SCFs the most recent representative U.S. microdata on household saving were collected by the 1963-64 Survey of Financial Characteristics of Consumers (SFCC). While there is a great deal of information on the dynamics of family income [for example, see Duncan (1987)], because of the paucity of data it has not been possible to track the corresponding variability of wealth or identify the determinants of such change.

Unlike any other current U.S. survey, the SCFs were specifically designed as wealth surveys.[1] The survey instruments were designed to gather exhaustive detail on all household assets and debts. To better represent high-income households, which are typically under-represented in household surveys, a portion of

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[1]The Survey of Income and Program Participation (SIPP) conducted by the Bureau of the Census, has also collected panel data on wealth [see McNeil and Lamas (1989)]. Currently, estimates have been released for 1984 and 1985. However, SIPP was not designed specifically as a survey of wealth; this is reflected in the fact that the asset categories used in that survey are more highly aggregated than those used in the SCF and the fact that it lacks a supplemental high-income sample. See Avery, Elliehausen and Kennickell (1988) and Curtin, Juster and Morgan (1989) for a comparison of wealth measurements from the 1983 SCF and other household surveys.

the survey sample was drawn from tax files on the basis of income. In addition, the surveys were run as a panel, with the same households interviewed in 1983 and 1986. Consequently, the data can be claimed credibly to represent fully the distribution of national saving (defined as the change in wealth). Although even these data are replete with noise, our hope is that the three-year span between the surveys is long enough to reveal true economic change in the measurement of saving, yet short enough to maintain a reasonably stable frame of measurement.

Since so little is known about U.S. saving behavior at the household level, the most important objective of this paper is to develop a descriptive framework to support future analysis. Thus, the material presented here is intended to describe distributions and to decompose variances, not provide structural models. Nevertheless, it seems clear to us that much of the evidence presented strongly limits the class of models or structural relationships that realistically can be expected to be supported by future research.

The remainder of this paper is organized as follows. In the next section we address conceptual and technical questions related to the issue of measurement. We briefly describe the design of the 1983 and 1986 surveys, and the procedures used to develop sample weights and to impute missing data values. We also compare the wealth changes observed in the survey with independent aggregate measurements from the Federal Reserve Board Flow-of-Funds accounts. In Section III we decompose the variance of household-level saving in several ways. We show that only a very small proportion of the variation in individual saving can be explained by the income and life-cycle factors typically advanced as the major determinants of savings in economic models. However, despite the poor predictive power of such variables at the micro-level, we show that these variables are capable of explaining virtually all of the aggregate U.S. saving for the 1983–86 period. In Section IV we look at saving in terms of predicted saving and other observable characteristics of households. Finally, in Section V we provide a summary and conclusions.

II. The 1983 and 1986 Surveys of Consumer Finances

A. *Survey Design*

The 1983 and 1986 Surveys of Consumer Finances were conducted by the Survey Research Center (SRC) of the University of Michigan for the Federal Reserve Board, the Department of Health and Human Services and other federal agencies. For the 1983 survey, interviewing was conducted in person between February and August of 1983. The 1986 survey consisted of a telephone interview of the same respondents between June and September of 1986.[2] Both surveys were designed to collect detailed data on household assets and liabilities of U.S. households.

The sample for the original 1983 wave of the survey consisted of an area-probability sample and a supplemental sample of high-income households drawn from tax files.[3] Standard methods were used to draw the area-probability sample;

[2]Interviewing for the 1989 SCF, the third wave of the series, was completed in early 1990. The 1989 survey consists of reinterviews with a portion of the 1983 sample and a new cross-section.

[3]A more detailed description of the survey can be found in Avery *et al.* (1984a, b), Avery and Elliehausen (1986, 1987), and Avery, Elliehausen, and Kennickell (1988).

a total of 5,396 households were selected for this sample, of whom 3,824 (71 percent) participated in the survey.[4] The supplemental high-income sample was drawn from a large sample of 1980 Federal tax returns by the Statistics of Income Division (SOI) of the Internal Revenue Service (IRS). Using multifaceted sampling criteria, SOI selected about 5,000 returns of high-income taxpayers who resided in the sampling areas of the area-probability sample.[5] These taxpayers were sent letters asking if they would be willing to participate in the survey; 459 households agreed to participate, of which 438 ultimately completed interviews. Within each survey household the "economically dominant" (primary) family (or individual) was interviewed.[6]

The 1983 questionnaire solicited a detailed inventory of household assets and liabilities including all bank accounts, stocks, bonds, business and property holdings, homes, life insurance, automobiles, profit-sharing and other employer accounts, and all debts and mortgages including loan terms and amounts outstanding.[7]

For the 1986 re-interview, both original respondents and their spouses were included separately in the sample if they had divorced or separated since the 1983 interview. Other people who left the household, such as young adults were not followed. A total of 2,822 eligible respondents were reached. As in the 1983 survey, the unit of observation was the family.[8]

Because the 1986 SCF was designed primarily to update essential information in the 1983 SCF—the household balance sheet sheet and employment data—the questionnaire for the 1986 survey was more limited than that of 1983 than that of 1983.[9] While more aggregated asset and debt categories were used (roughly 25 categories versus 85 in 1983), sufficient information was collected that household net worth could be estimated. Limited information was also solicited on purchases and sales of houses, major expenditures for health, durables, charity, and education, and the disposition of assets in divorce or upon death of a spouse. In addition, income, marital, and employment histories over the intervening three year period were gathered.

There are several important points that limit the comparability of data from the two surveys. The questionnaire for the 1983 survey was far more extensive than that for the 1986 survey; and the 1983 survey took place in person, while the 1986 survey was conducted by telephone. Some information, such as the value of principal residences and home mortgages, was solicited in similar ways

[4]Observations selected for the 1983 SCF were drawn from 75 primary sampling units in 37 states and the District of Columbia. For a further discussion of the SRC sample see Hess (1985).

[5]For a description and evaluation of this sample see Herringa and Woodburn (1990).

[6]This definition of family differs from that of the Census Bureau, which excludes single individuals. Since some persons within a household—those not related to the primary family—were not interviewed by the SRC, wealth figures will understate the U.S. household total. We estimate, however, that the understatement is only about 0.4% for 1983. Because the number of primary families and households is the same, we use the terms interchangeably in this paper.

[7]Extensive data were also obtained on employment histories and pension and Social Security entitlements of the respondents and their spouses. In addition, a separate survey was also conducted with the employers of approximately 75 percent of those households reporting pension benefits to assess the value of private pensions [see Curtin (1986)].

[8]At first glance, it might appear to be more desirable to measure wealth at the individual level. However, this appears to substantially increase interviewer burden with no increase in accuracy.

[9]For a more detailed description of the 1986 survey see Avery and Kennickell (1988).

in both years. Other data, such as financial assets, were collected in much more aggregated form in 1986. In making comparisons across the two years, there are four areas which may be particularly subject to problems of measurement error. First, for some debts, only the payments—not the amount outstanding—were collected in 1986; thus, amounts outstanding on these debts had to be estimated using independent information on average terms. Second, for automobiles, only purchase data were collected in 1986; thus, assumptions had to be made about the treatment of existing automobiles to value the 1986 stock. Third, the cash value of whole life insurance was not collected at all in 1986 and had to be estimated from 1983 values. Finally, there were problems in the ordering of questions in the business and employment sections of the 1986 survey that caused many respondents' businesses to go unreported; while imputations were made in some of these instances based on 1983 data and some marginal notes in the questionnaires, we suspect that 1986 business values in the survey are still underestimated.

B. *Imputations and Sample Weights*

To be useful in analysis, it appears that wealth data require extensive editing. Respondents often use a taxonomy different from that intended by the designers of the survey. Moreover, sometimes respondents fail to report values for some items, either because they genuinely do not know, or because they view the item as being too sensitive. In the case of the 1983 and 1986 SCFs, extensive editing and imputation were undertaken. In general, imputations were made in such a way that the conditional first and second moments of the sample were preserved. In the case of the 1986 survey, precautions were also taken to insure that longitudinal covariances were also preserved.[10]

Due to the dual-frame design of the original 1983 sample, proper weighting is not as straightforward as in a simple area-probability design. A post-stratification scheme derived from the IRS Tax Model File was used to blend the weights for the full 1983 sample, and was constructed from the simple area-probability weights (adjusted for unit nonresponse within each primary sampling unit) and the weights for the high-income sample. All of the analysis reported in this paper using the entire 1983 sample is done using this weight.

The construction of the 1986 sample weights is more problematic. For some purposes it is convenient to view the 1986 panel of respondents as a representative subset of the 1983 sample, while for other purposes it is useful to consider it as an approximation to a new 1986 sample. Construction of weights for the former purpose is straightforward, and if all "births and deaths" of households were represented by the behavior of the existing panel, construction of the latter would be as well. The 1986 sample design was such that new households formed as a result of divorce should be properly represented, as should dissolutions of households stemming from marriage or death. However, the relatively small number of households formed by new immigrants over this period will not be represented. More importantly, because the 1986 design required that the house-

[10]For a complete description of imputation and weighting methods used see Avery and Elliehausen (1987) and Avery and Kennickell (1988).

hold head (or his spouse) also have been a 1983 head (or spouse), new households formed by persons leaving larger households (other than divorced or separated spouses), or by persons leaving non-household living arrangements (such as college dormitories or military housing), will not be represented.

A pair of weights was constructed for the 1986 sample, one to represent the 1983 population of which the 1986 sample is a sub-sample, and one weight to represent the 1986 population. First, to allow for differential attrition from the 1983 sample, a model was fit to estimate the probability of re-interviewing a 1983 respondent, conditioning on a number of salient characteristics observed in 1983.[11] The inverse of this probability was then used to adjust the original 1983 sample weights for those respondents re-interviewed in 1986 (with appropriate corrections for divorce and marriage). Second, two different post-stratification schemes based on data from the Current Population Survey (CPS) were employed to create the two sample weights.

For the weight intended to represent the 1983 population using the 1986 sample, the attrition-adjusted weights were post-stratified to 1983 CPS control totals for age, marital status, and home ownership.[12] This weight is used for all calculations in this paper that involve saving or individual-household changes in wealth.

With one exception, the weight designed to represent the 1986 sample as the 1986 population was fit to 1986 CPS control totals in a parallel manner. As noted above, the 1986 design provides limited coverage of new households formed by break-offs from other households and no coverage of persons leaving institutions. The households missed in this way will tend to be largely younger households. Thus, the younger households that are actually observed in the 1986 sample are unlikely to be representative of all young households. Since it appears unlikely that weighting adjustments alone could compensate for this omission, a decision was made to post-stratify only households with heads aged 25 and over in 1986.[13] This weight was used in all calculations involving levels of 1986 wealth in this paper.

C. *Measurement Issues*

For measuring saving, the ideal sample frame would be dollars of saving, not households. The household-based frame used for the SCFs only imperfectly

[11]One particularly important factor in attrition is the fact that 1986 respondents had to have a telephone, whereas 1983 respondents did not.

[12]The decision to post-stratify by homeownership was made very reluctantly because of the feeling that the SCF should represent an independent assessment of wealth, of which homeownership is an important part. Unfortunately, homeownership in the 1986 SCF appears to be related to attrition in ways that cannot be forecasted from 1983 information. Without post-stratification for homeownership (actually the 1986 CPS homeownership rate adjusted for differences between the 1983 CPS and SCF homeownership rate), the 1986 SCF sample over-predicted homeownership by about three percentage points.

[13]For this reason, figures reported in this paper are based only on the set of households with heads aged 25 and over. This decision is strongly recommended for other work with these data as well. Data from the 1983 survey indicate that little wealth is missed by ignoring the population under 25. We estimate that asset, debt, and net worth totals would be only 0.9 percent, 0.3 percent, and 0.6 percent higher, respectively, if these younger households were included. However, these households would have added 4.2 percent to total income and would have increased the total number of households by 8.7 percent.

corresponds to a dollar-based frame. To the extent that they differ, implications drawn from a household-based frame will not apply directly to an aggregate concept of national personal saving. The dollar-based and household-based frames differ in two important ways. First, the household-based frame may miss saving and dissaving associated with some new household formations. Second, the frames can differ because of analytic uncertainties about the treatment of household change, particularly in the cases of marriage, separation, divorce, and death.

Probably our implicit treatment of new household formation—that all new households come from divorce or from the aging of a growing population, both of which we can represent within the 1986 sample—is not too harmful. It is unlikely that the types of households omitted (those who were out of the sample universe in 1983—new immigrants and those living in subfamilies, prisons, military bases, or other institutions) would account for substantial amounts of wealth or saving. Moreover, many of the households missed in this way would have heads aged 24 and under, a subset of the population we have explicitly chosen not to represent in 1986. In calculations reported elsewhere (Avery and Kennickell, 1988), we estimate that other than immigrants, only 1.7 million people (and presumably a smaller number of households) out of a total of 107 million aged 25 to 60 in 1986 would have been missing from a sample frame like that used for the SCF.

A potentially more serious problem is the treatment of households that passed out of the sample universe—particularly households where the head (or spouse) died.[14] Since both the probability of wealth and death are increasing functions of age, the amount of wealth leaving the sample because of death of the respondent is likely to be substantial. In principle, much of this wealth should reappear elsewhere in the sample as inheritances, though some might be lost to medical and funeral expenses and charitable bequests. In practice, however, estates in the process of settlement or bequests given to minors are likely to be missed in the SCF frame. Moreover, even if all such wealth transfers were picked up, the exclusion of households passing out of the sample means that the aggregate saving of sample households will overstate that of society as a whole, since the expenditures associated with death are ignored. As we continue to investigate the role of aging in saving, we expect to consider this question in more depth.

The 1986 respondents who experienced a change in the composition of their households since 1983 present another measurement problem. Wealth was measured on a household basis in both 1983 and 1986. In cases where the household structure did not change, the calculation of saving as the change in wealth is straightforward. However, the appropriate treatment of cases where sample members divorced or married, or where they lived with different family members in 1983 than in 1986 is much less clear. Theoretical economists have made little headway in developing frameworks for modeling saving and wealth in a world of continually changing household composition. Empirical practice is often not much better. Due to definitional problems, samples are often pruned

[14]Of the families in the 1983 sample with heads 70 or older, 10.9 percent died before 1986 (death of a family here is defined as the death or institutionalization of a single person or both the head and spouse in a married couple).

to drop all non-intact families. However, if such transitions generate dead-weight losses, or if these transitions are otherwise non-random with respect to the variables of interest, the use of only intact household samples almost surely induces sample selection bias. As an alternative, we chose to try to adjust the saving of households undergoing such changes.

In computing savings (the change in wealth) for sample members who were married in 1983, but divorced in 1986, we arbitrarily attributed one-half of the 1983 wealth to each partner (at least in some states there is a legal justification for this assumption). By definition, saving for couples marrying between 1983 and 1986 is the difference between their combined 1986 wealth and the sum of their 1983 individual wealth. However, because we have no information on the 1983 wealth-holdings of persons marrying into the sample, we assume that such people had wealth equal to that of their new spouses. Other changes in household structure have even more complicated effects. In some cases, adult families members or friends moved into or out of sample households, sample respondents moved in with families where they would not be chosen as the respondents according to the 1983 definitions (for example, respondents who moved back in with their parents). Due to the complete lack of information on the wealth of these other household members, we were unwilling to make any systematic adjustment to the saving estimates for these households.

The seriousness of the issue of household structural change can be seen from the following descriptive statistics. Defining household status in terms of six groups—single or married households each further classified according to whether they are living with no other adult relatives, living only with adult children (those 22 and older), or living with some other adult relative (22 or older)—26.6 percent of the sample experienced a change in status during the three year interval. Roughly six-tenths of these (15.6 percent of the whole sample) experienced a change in marital status. Moreover, households experiencing a change in status were not an inconsequential group in terms of wealth holdings or saving; 20.7 percent of total household wealth in the 1986 sample was held by households that had experienced a change in status since 1983; 7.6 percent of 1986 wealth was held by households that had undergone a change in marital status. Households changing status had a similar share (18.8 percent) of the total saving of net savers over the three years. They had an even larger share (31.4 percent) of the dissaving of those households losing wealth over the three year period. To put the latter figure in perspective, the dissaving of those households undergoing a change in status is over 20 percent of the total U.S. gross private saving over the three-year period.

D. *Comparison of Survey and Aggregate Estimates of Saving*

It is commonly believed that survey-based estimates of aggregate wealth and saving seriously understate estimates computed from other institutional sources because of under-sampling of the very wealthy in surveys and under-reporting of assets by respondent households. Evidence reported elsewhere [Avery, Elliehausen and Kennickell (1988)] suggests that this belief may be incorrect in the case of the 1983 SCF. For this survey, estimates for many asset and debt

categories were within 5 to 15 percent of aggregate estimates drawn from the U.S. flow-of-funds (FOF) accounts for the same time period.[15] Moreover, the survey-based estimates were not systematically higher or lower than FOF estimates. Estimates did differ substantially for checking and savings accounts, business, and some real estate categories. However, since these are areas where there are significant problems in the FOF, it is not clear whether discrepancies stem from measurement problems in the survey-based estimates or from the FOF or both.

TABLE 1

A COMPARISON OF SURVEY-BASED WEALTH AGGREGATES WITH FLOW-OF-FUNDS ESTIMATES

($ Billions)

	Survey			Flow of Funds		
Item[1]	1983 ($)	1986[2] ($)	% Growth	1983 ($)	1986[2] ($)	% Growth
Financial institution accounts/CDs	1,032.9	1,418.8	37.7	1,832.5	2,485.3	35.6
Stocks/bonds	1,545.8	1,975.3	27.9	1,438.3	2,456.9	70.8
Principal residences	4,276.4	5,211.9	21.9	2,703.4	3,388.3	25.3
Non-corp. business	1,852.8	1,951.6	5.3	2,347.1	2,415.6	2.9
Home mortgages	995.4	1,290.9	29.7	1,064.6	1,480.6	39.1
Other debt	224.9	346.4	54.0	332.8	519.7	56.2

[1]Classifications are not exhaustive.

[2]The 1986 survey figures were extrapolated to include households under 25. The flow-of-funds estimates were adjusted to take out non-profit holdings.

A similar comparison can be made to see if changes in aggregate household wealth as measured by survey data track the changes measured by FOF. In Table 1 we show estimates of levels and changes in levels of household wealth from FOF and the 1983 and 1986 SCFs. The survey estimates given are weighted sums of the various asset types using the appropriate statistical sampling weights. For all categories except stocks and bonds and businesses, the survey and FOF growth rates are roughly in the same ranges. The problem with businesses was discussed above. The behavior of stocks is more puzzling. One explanation may be that because the 1986 survey was less detailed than the 1983 survey, respondents may have been less rigorous in recalling exact market values of shares. In a time of rapidly rising share prices, this may have induced substantial bias.[16]

In magnitude, the change in the survey-based estimates of gross household wealth change corresponds very closely to U.S. National Income Account (NIA)

[15]The FOF accounts are widely regarded as the most reliable source of aggregate data on the compositions of U.S. national wealth. See Board of Governors of the Federal Reserve System (1971) and Wilson *et al.* (1989) for a description of the FOF.

[16]A more complete comparison of the changes in wealth composition between 1983 and 1986 can be found in Avery and Kennickell (1989).

saving figures. The NIA accounts show $1,954 billion in gross private savings for 1983 through 1985 while the survey-based estimates show a growth of $1,949 billion.[17] However, perhaps not too much should be made of this close correspondence since the two figures represent somewhat different concepts. The survey-based figure reflects the total change in household wealth. This change stems from the appreciation of assets—particularly housing and publicly-traded stock—as well as saving out of current income. Most appreciation is not directly included in the NIA concept of saving. In addition, the NIA concept includes net employer contributions to pension plans, which are not included in the survey measure we have constructed. The FOF figures are perhaps better points of comparison since they define saving as the change in wealth. Total FOF-defined household wealth grew $3,127 billion over roughly the same period, a figure about 50 percent higher than that derived from the survey.

III. Predictability of Wealth and Saving

Unlike the aggregate measures of saving, the survey data offer the opportunity to explore the change in wealth in a way which may help to shed light on the basic determinants of saving. The panel nature of the 1983/1986 SCF dataset permits the calculation of saving (changes in wealth) for individual households. Most of the remainder of this paper is concerned with describing individual saving and examining its relationship to other variables. In this section, we develop a basic framework for this analysis. We use several different constructed variables which were computed as follows:

Predicted Wealth. This variable is based on a "life-cycle" model of wealth fit using the 1983 SCF data. The model incorporated 67 explanatory variables including: age splines (with interactions for race and marital status); household composition variables; variables characterizing the education and employment status of households; locational variables; and income splines (with interactions for age). The model was fit using the level of total non-pension 1983 household wealth (but including IRA, Keogh, thrift-type, and profit-sharing accounts) as the dependent variable.[18] All dollar values were expressed in constant 1986 dollars.[19] Two calculations were made using the estimated coefficients. *Predicted 1983 Wealth* is estimated using 1983 values of the explanatory variables; *Predicted 1986 Wealth* is computed using the 1986 values of the explanatory variables.[20]

[17]Gross private saving, rather than personal saving, is used here to allow for retained earnings, which in principle are reflected in changes in the value of firms owned either directly or indirectly by households. See Wilson *et al.* (1989) and Corrado and Steindel (1980) for a detailed discussion of the differences between NIA and FOF measures of savings.

[18]The model was also fit in logs, with an R-square of 0.45. Very few of the conclusions of the exercises dependent upon this variable differed substantially when log predictions were used.

[19]A copy of the estimated model is available from the authors upon request.

[20]We also fit a wealth model using the 1986 sample and used it to predict 1986 and 1983 wealth. When the 1986 function was substituted for the 1983 function it had virtually no effect on any of the substantive conclusions of the paper. The 1983 and 1986 wealth functions appear to be very similar. When fit on the 1986 data, the 1986 function explained 40.2 percent of the variance, compared to 40.1 percent for the 1983 model. The 1986 model predicts 1983 only slightly worse than the 1983 model (39.0 percent of the variance versus 40.2 percent). A statistical test of the null hypothesis that the wealth function did not change between the two years could not be rejected at the 5 percent level.

Actual Real Saving. For most households this is the difference between their actual 1986 non-pension wealth and their actual 1983 non-pension wealth as measured in 1986 dollars. If a respondent was single in 1983, but married in 1986 then we assume he married someone with the same 1983 wealth. Thus, the saving of the 1983 respondent is set equal to one-half of the couple's 1986 wealth minus the respondent's 1983 real wealth. If a couple divorced or separated between 1983 and 1986, the saving for each person was defined as his 1986 wealth minus one-half of the original couple's 1983 real wealth. For couples that divorced and remarried during the three-year period, their saving is set equal to one-half of the difference in the total real wealth measured in 1983 and 1986. *Actual Nominal Saving* is the difference between 1986 and 1983 wealth, similarly adjusted for marital status changes, measured in current dollars.

TABLE 2

CORRELATION OF 1983 AND 1986 WEALTH, PREDICTED AND ACTUAL SAVING

Item	Real Predicted Saving	Nominal Predicted Saving	Real Actual Saving	Nominal Actual Saving	1983 Wealth	1986 Wealth
Real predicted saving	1.00	0.93	0.29	0.26	−0.05	−0.00
Nominal predicted saving	0.93	1.00	0.21	0.22	0.09	0.14
Real actual saving	0.29	0.21	1.00	0.98	−0.03	0.32
Nominal actual saving	0.26	0.22	0.98	1.00	0.17	0.51
1983 wealth	−0.05	0.09	−0.03	0.17	1.00	0.92
1986 wealth	−0.00	0.14	0.32	0.51	0.92	1.00

Predicted Real Saving. The difference between *Predicted 1986 Wealth* and *Predicted 1983 Wealth* is the predicted change in wealth for each household attributable to shifts in income and demographic characteristics over the three-year period. For those households undergoing a change in marital status, predicted saving is adjusted in the same manner as actual saving above. *Predicted Nominal Saving* is the difference between predicted 1986 wealth in current dollars and predicted 1983 real wealth deflated to 1983 dollars.

When predicted and actual wealth changes are compared, the most striking finding is their apparently very low correlation (Table 2). Only 8.2 percent of the variation of actual real saving can be explained by predicted real saving. Only 4.8 percent of nominal saving can be explained by nominal predicted saving.[21] These fits can be improved somewhat by regressing saving against the 1983 (and 1986) explanatory variables used for the predicted wealth equations in a fashion unconstrained by the restrictions inherent in the wealth functions; 15.7 percent

[21]The difference between nominal and real saving is not as straightforward as it may appear. The real saving of a household is equal to its nominal saving minus the depreciation of its nominal 1983 wealth (prices changed about 11.1 percent from 1983 to 1986). Thus, real and nominal saving are identical for a household with no 1983 wealth, but will differ substantially for households with large 1983 wealth.

of the variation of real saving and 17.0 percent of nominal saving can be explained using 1983 demographic variables and predicted saving. These figures fall to 11.8 and 12.8 percent respectively when 1986 demographic variables are used. The addition of actual 1983 wealth adds very little to the predictive power of these models. Predicted saving and 1983 wealth explain only 8.2 percent of the variation in real saving and 7.1 percent of the variation in nominal saving.

The extreme amount of noise inherent in the individual saving data was made abundantly clear when we could not explain more than 16 percent of real saving variation irrespective of the explanatory variables used (even 1986 wealth). Moreover, it does not appear that this is a problem peculiar to this survey. We tried similar experiments using the 1963 and 1964 waves of the SFCC.[22] In that case, a comparable measure of predicted saving explained only 3.3 percent of the variance of real saving and 3.9 percent of nominal saving over the one-year period; when actual saving is regressed unconstrained against the set of 1963 explanatory variables and predicted saving, only 6.8 percent of real saving and 10.2 percent of nominal saving was explained; the addition of 1963 wealth increases the explained variance to 8.9 percent and 16.5 percent for real and nominal saving, respectively. The fact that these results are so similar to those derived from the SCF is both comforting and troubling. The SFCC measured the change in wealth between the two points in time by asking the 1964 respondent to update the balance sheet they furnished a year earlier. This suggests that simple measurement error in the SFCC is probably close to the minimum one could ever hope to achieve in survey data. Thus, if the results of this comparison are more than a peculiar coincidence, this would suggest that the largest part of variation in saving may stem from more idiosyncratic factors than are allowed for in these models.

On the surface this appears to strike a discordant note about the use of micro-based saving data to explain macro saving changes. However, it appears that much of this noise may balance out in the aggregate. If, for example, all of the variation of actual saving about predicted levels were random and non-systemic, then the implied standard error of mean household saving is only $30. In addition, even though demographic variables explain only a small portion of the variation in cross-sectional saving, in the aggregate, the predicted change in wealth stemming from changes in demographics between 1983 and 1986 amounts to over $8,000 per household. Thus, extreme amounts of cross-sectional noise may not be inconsistent with broad demographic changes accounting for a significant portion of the year-to-year changes in aggregate wealth.

IV. Patterns of Saving

In this section, we look at the composition and distribution of individual household saving. In Tables 3 and 4 we give the distribution of net real saving over 1983 and 1986 wealth categories, respectively. In addition we break down

[22]For this purpose we used a version of the SFCC in which we imputed the missing values for variables used in the exercise and computed a weight that adjusts for attrition between the two years. Since only changes in the stock of some variables were collected in the 1964 reinterview, it was necessary to make a number of auxiliary assumptions in order to compute nominal saving.

TABLE 3

SHARE OF REAL SAVING 1983-86, BY 1983 WEALTH CLASSES, PERCENT DISTRIBUTION

Percentile of 1983 Wealth	Positive Real Saving	Dissaving	Net Real Saving	*Memo*: Share Net Wealth
0 to 10	3.4	0.1	8.1	−0.2
10 to 20	2.2	0.3	4.7	0.1
20 to 30	2.1	0.5	4.2	0.4
30 to 40	4.0	1.3	7.7	1.2
40 to 50	3.1	2.4	4.1	2.2
50 to 60	5.0	3.1	7.7	3.6
60 to 70	5.1	4.6	5.9	5.2
70 to 80	9.1	4.8	15.1	7.9
80 to 90	14.1	11.1	18.3	12.8
90 to 100	52.0	71.8	24.1	66.6
90 to 95	8.4	13.7	1.1	12.0
95 to 99	20.5	27.9	10.0	22.7
99 to 99.5	6.9	4.7	10.1	6.3
99.5 to 100	16.2	25.5	2.9	25.6

Memo:

Mean amount	Positive saving	Dissaving	Net Saving
(1,000 of 1986 $)	65.4	52.7	15.4

Total dissaving/total positive saving = 0.587.

TABLE 4

SHARE OF REAL SAVING 1983-86, BY 1986 WEALTH CLASSES, PERCENT DISTRIBUTION

Position in 1986 Defined in Terms of 1983 Wealth Deciles	Positive Real Saving	Dissaving	Net Real Saving	*Memo*: Share Net Wealth
0 to 10	0.2	2.7	−3.3	0.3
10 to 20	0.2	4.6	−6.0	0.9
20 to 30	0.7	3.9	−3.7	1.1
30 to 40	1.6	5.1	−3.5	1.9
40 to 50	2.3	4.1	−0.4	2.6
50 to 60	2.8	6.7	−2.8	4.2
60 to 70	4.2	7.6	−0.7	5.8
70 to 80	7.0	5.8	8.8	7.8
80 to 90	13.2	13.2	13.2	13.3
90 to 100	67.8	46.2	98.4	62.0
90 to 95	11.3	9.1	14.5	11.0
95 to 99	21.4	15.1	30.2	20.6
99 to 99.5	7.0	3.4	12.1	6.0
99.5 to 100	28.1	18.6	41.6	24.4

net real saving into dissaving and positive saving. As might be expected, all of these measures of saving are relatively concentrated in the top part of the wealth distribution. Since those who had very large saving should be clustered near the top of the 1986 wealth distribution, one would expect saving to look somewhat more concentrated when classified by 1986. However, the degree of concentration of saving in the top decile—particularly for net saving—increases dramatically from 24.1 percent when classified by 1983 wealth to 98.4 percent when classified

TABLE 5

SHARE OF NET SAVING, BY 1983 AND 1986 WEALTH CLASSES, PERCENT DISTRIBUTION

1983 Wealth Group	Position in 1986 Defined in Terms of 1983 Wealth Deciles									
	1	2	3	4	5	6	7	8	9	10
0 to 10	0.3	0.2	0.5	0.6	1.0	0.4	0.4	0.4	0.1	4.2
10 to 20	−0.4	0.0	0.8	0.8	1.1	0.6	0.7	1.1	0.0	0.0
20 to 30	−0.2	−0.4	0.4	1.4	1.2	1.0	0.3	0.5	0.0	0.0
30 to 40	−0.5	−0.6	−0.6	0.5	1.8	1.5	1.9	2.2	0.9	0.6
40 to 50	−0.5	−0.2	−0.9	−1.4	0.7	2.5	1.7	1.2	1.0	0.0
50 to 60	−0.4	0.0	−0.8	−1.5	−1.5	1.1	3.4	2.8	3.1	1.5
60 to 70	0.0	−1.1	−0.5	−0.8	−2.5	−1.4	1.5	4.2	5.6	0.9
70 to 80	0.0	0.0	−0.1	−0.2	−0.7	−2.1	−3.3	2.0	14.8	4.7
80 to 90	−0.8	0.0	−1.1	−0.8	−1.3	−2.6	−3.4	−3.8	7.1	25.0
90 to 100	−0.7	0.0	−4.8	−3.0	−0.1	−3.2	−3.9	−2.9	−21.8	64.5
All families	−3.2	−2.1	−7.1	−4.4	−0.3	−2.2	−0.7	7.7	10.8	101.4

Memo: Share of saving by families in same group both years: 78.1
Share of saving by families that moved to a lower group: −76.8
Share of saving by families that moved down only one group: −34.6
Share of saving by families that moved to a higher group: 98.6
Share of saving by families that moved up only one group: 54.1

by 1986 wealth. As shown in table 5, the net saving of families that moved to a higher part of the wealth distribution in 1986 was almost equal (98.6 percent) to total aggregate net saving. Moreover, 44.5 percent of such saving was generated by families that moved up more than one group. Families that moved to a lower group accounted for −76.8 percent of net saving.

In Table 6 we decompose the sources of saving and dissaving into broad portfolio changes by 1983 wealth classes.[23] With the exception of the top group, changes in the holdings of real assets dominate positive saving and dissaving at every wealth level. While most groups of dissavers experienced an increase in debt, it is only a small part of the decrease in net wealth. On the other hand, for the groups of savers below the 80th percentile, new acquisitions of debt represent a substantial offset to increases in the value of other assets.

It is interesting to ask to what extent can the decline in U.S. household saving be attributed to changes in broad demographics. The fact that the growth in the number of households over this period (8.0 percent) exceeded the growth of aggregate wealth (7.4 percent) suggests that broad demographic changes may have contributed to the decline in the saving rate. This figure is substantially below what we would predict for the change in real wealth on the basis of the predicted wealth function described earlier. The difference of predicted 1986 wealth and predicted 1983 wealth yields an expected increase in real wealth per household of 4.3 percent. Combined with population growth, this implies an expected growth in aggregate real wealth of 12.7 percent due to broad demographic and income changes. That is, demographic and income changes are projected to enhance wealth growth rather than dampen it. However, it appears that virtually all of this change stems from the effects of real income growth.

[23]An extended version of this table is available from the authors upon request.

TABLE 6

COMPONENTS OF REAL POSITIVE SAVING AND DISSAVING, 1983 TO 1986 BY 1983 WEALTH CLASSES, PERCENT DISTRIBUTION

Percentile of 1983 Wealth	Positive Savers			Disavers		
	%Δ Paper Assets	%Δ Real Assets	%Δ Debt	%Δ Paper Assets	%Δ Real Assets	%ΔDebt
0 to 30	20.7	110.2	−31.0	12.6	56.6	30.9
30 to 40	27.7	93.1	−20.9	29.1	68.3	2.6
40 to 50	24.7	78.5	−3.3	29.2	43.6	27.2
50 to 60	40.1	68.1	−8.2	18.9	62.4	18.7
60 to 70	37.9	58.6	3.6	16.6	85.1	−1.6
70 to 80	45.9	60.7	−6.6	27.0	43.8	29.2
80 to 90	47.4	57.8	−5.2	27.6	78.7	−6.3
90 to 100	51.7	56.1	−7.7	25.7	74.0	0.4
90 to 95	32.0	70.5	−2.4	21.7	75.7	2.6
95 to 99	46.3	61.8	−8.1	31.0	68.8	0.2
99 to 99.5	37.0	56.5	6.4	35.4	68.0	−3.4
99.5 to 100	74.7	41.3	−16.0	19.4	80.4	0.2

Notes:

1. Real assets include all real estate, businesses, and automobiles. Paper assets include all other types of assets (accounts, stocks, mutual funds, bonds, thrift-type accounts, IRAs and Keoghs). Debts include all mortgages, installment debt, outstanding credit card balances, and other direct debts of the household.

2. Negative numbers in the debt column for positive savers indicate that debt increased.

3. Dissaving is taken here as a negative number. Thus, positive numbers in the columns for paper and real assets for dissavers indicate a decrease in the type of asset. Correspondingly, a positive number in the debt column for this group indicates an increase in the level of debt.

Similar predictions made using a wealth model without income imply a *fall* in real wealth per-household of 7.9 percent. Much of this fall appears to stem from the increase in the proportion of single households over this period. Typically these households have less wealth than others. While these figures give some credence to the view that the U.S. saving rate may have declined somewhat because of demographic factors, they also suggests that real income effects may have more than offset these effects.

Further insight into the factors underlying these changes is provided in Table 7, which gives the distribution of saving and 1983 and 1986 wealth by a number of different classifications.[24] While, obviously, many of these classifications are not independent, it is instructive to consider variation at this simple level of classification. Both real and nominal mean saving are positive in every age group. This does not accord well with the aggregate expectations of the life cycle hypothesis.[25] Though median real saving does become negative in the over-70 age group, it is mean behavior, not median behavior that determines macro outcomes. However, it is possible that the life cycle hypothesis offers a very good way of understanding the behavior of broad masses of people without being descriptive in a macro sense.

Income appears to be a very powerful explanatory factor. An overwhelming proportion of total saving is done by the 10 percent of families with income

[24]A more extended version is available from the authors upon request.

[25]See Kennickell (1984) and Ando and Kennickell (1987) for a survey of other such evidence.

TABLE 7

1983 AND 1986 NET WEALTH, AND SAVING 1983 TO 1986 MEANS AND MEDIANS, BY VARIOUS CHARACTERISTICS

Item	% in Group	Net Wealth 1983 (1986 $1000s) Mean	Net Wealth 1983 (1986 $1000s) Median	Net Wealth 1986 (1986 $1000s) Mean	Net Wealth 1986 (1986 $1000s) Median	Saving Nominal ($1000s) Mean	Saving Nominal ($1000s) Median	Saving Real (1986 $1000s) Mean	Saving Real (1986 $1000s) Median
Age of Head in 1983									
20-35	31.1	32.0	7.1	49.2	17.8	16.3	3.5	13.3	2.4
35-44	19.8	108.0	48.8	125.1	57.9	24.8	7.9	14.8	3.2
45-54	14.3	198.2	66.6	222.7	73.0	37.9	8.2	18.7	4.2
55-64	15.4	204.8	71.3	228.4	74.2	42.2	6.5	22.4	0.5
65-69	6.8	268.5	64.0	303.1	66.5	56.9	5.1	30.5	0.5
>=70	12.6	153.4	49.6	159.3	46.7	16.9	0.5	1.4	−0.5
Family Income in 1982									
<0	0.1	107.1	59.5	34.5	33.9	−35.8	−19.3	−43.6	−25.6
0-10	20.8	24.2	6.0	26.3	9.0	3.9	0.4	1.5	0.0
10-20	27.1	45.7	20.0	49.7	22.3	6.7	1.6	2.2	0.1
20-35	26.7	80.0	40.7	83.6	49.1	11.2	8.2	3.6	3.9
35-50	12.9	118.4	83.4	141.1	104.7	32.9	18.3	21.2	12.3
>=50	12.5	598.8	205.1	708.2	243.1	144.7	46.8	87.2	28.0
Education of Head									
<9	15.2	49.8	20.4	46.5	19.8	0.5	0.5	−4.6	0.0
9-11	14.0	56.2	21.1	60.1	24.0	7.4	1.1	1.8	0.0
12	30.0	94.1	39.3	108.6	44.2	24.5	5.1	15.3	2.9
13-15	19.6	128.3	30.6	148.4	42.6	29.2	5.2	16.6	2.4
>=16	21.1	283.4	92.6	333.7	105.8	64.7	16.6	37.9	10.6
Race									
Non-hispanic white	81.9	150.0	48.4	172.5	54.2	33.1	6.1	18.7	2.9
Hispanic and non-white	18.1	33.2	7.7	36.2	11.5	4.3	0.4	0.9	0.0
Marital Status in 1983									
Married	61.1	172.8	54.3	197.0	59.5	40.8	8.0	24.2	4.2
Separated	4.8	39.2	5.0	49.1	6.0	14.7	0.5	12.1	0.0
Widowed	12.9	49.9	13.5	59.2	23.8	3.5	1.6	−1.5	0.8
Divorced	11.1	100.2	42.6	100.8	40.0	0.4	0.0	−9.7	−0.7
Never married	10.2	37.7	5.7	61.4	15.5	17.0	2.4	13.3	1.4
Household Composition in 1983									
Nuclear	87.2	137.8	41.4	157.2	46.7	29.6	4.7	16.2	2.3
Extended	8.2	72.1	27.5	82.2	35.0	10.3	1.1	3.5	−0.0
Unrelated	3.1	38.6	4.5	58.9	18.0	16.3	2.8	12.4	2.2
Other	1.4	104.2	4.5	148.6	7.6	52.2	−0.3	42.3	−0.3
Head in Labor Force in 1983									
Yes	71.7	144.3	40.6	170.1	50.4	35.4	7.1	21.6	3.6
No	28.3	89.4	27.6	91.4	25.9	8.7	0.4	−0.3	−0.1
Occupation Head in 1983									
Professional/ technical	13.9	139.9	46.6	172.1	63.3	41.7	12.4	28.7	7.7
Managers	9.2	354.6	90.3	440.4	120.7	113.9	24.0	79.6	13.4
Self-employed managers	3.5	506.5	191.5	548.4	178.2	67.2	13.3	19.4	3.2

TABLE 7—continued

Item	% in Group	Net Wealth 1983 (1986 $1000s) Mean	Net Wealth 1983 (1986 $1000s) Median	Net Wealth 1986 (1986 $1000s) Mean	Net Wealth 1986 (1986 $1000s) Median	Saving Nominal ($1000s) Mean	Saving Nominal ($1000s) Median	Saving Real (1986 $1000s) Mean	Saving Real (1986 $1000s) Median
Sales and clerical	10.2	115.0	36.1	138.7	41.4	27.0	6.4	16.1	3.4
Craftsmen	12.8	76.6	39.5	92.9	52.7	25.2	7.6	18.0	5.0
Laborers and service workers	20.3	34.3	15.3	43.0	20.7	9.7	2.3	6.2	0.9
Farmers	1.5	348.3	199.4	229.7	150.6	−85.0	−22.6	−119.7	−28.6
Armed forces	0.5	42.7	43.6	79.1	59.6	40.4	35.5	36.0	32.6
Not working	28.3	89.4	27.6	91.4	25.9	8.7	0.4	−0.3	−0.1
Pension Rights of Head as of 1983									
Anticipate or receiving benefits	49.0	138.0	53.1	159.6	57.6	33.4	10.3	19.9	5.8
Does not anticipate benefits	23.5	74.5	11.9	99.9	21.5	29.5	2.5	22.4	1.4
Retired, no benefits	18.7	73.5	10.6	76.9	14.0	9.7	0.0	2.3	0.0
Self-employed	8.8	339.6	136.2	359.9	126.8	31.6	5.1	−0.3	−2.2
Percentile of 1983 Wealth Distribution									
0 to 10	9.9	−1.9	0.0	16.3	0.1	12.5	0.8	12.7	0.8
10 to 20	10.1	1.8	1.7	10.5	3.5	8.1	1.3	7.9	1.2
20 to 30	10.0	6.2	6.0	14.6	8.9	6.8	2.6	6.3	2.0
30 to 40	10.0	15.4	15.1	30.5	19.3	13.4	4.6	11.9	3.0
40 to 50	10.0	29.4	29.5	34.9	31.5	7.7	2.9	4.8	−0.4
50 to 60	10.0	46.4	46.1	58.2	52.0	15.3	6.6	10.7	1.6
60 to 70	10.0	68.6	68.6	89.1	78.9	22.4	10.9	15.5	4.5
70 to 80	10.0	102.3	99.9	125.9	112.9	32.8	17.4	22.7	7.6
80 to 90	10.0	169.9	163.9	199.6	174.4	49.8	21.0	33.2	5.6
90 to 95	5.0	312.0	297.4	287.9	266.5	15.0	−7.4	−14.9	−34.3
95 to 99	4.0	722.4	640.6	783.4	604.9	110.3	27.4	40.5	−31.9
99 to 99.5	0.5	1,556.8	1,518.9	1,871.2	1,577.0	462.0	299.7	310.5	152.6
99.5 to 100	0.6	5,872.8	3,304.7	6,240.1	3,863.1	632.4	495.1	79.1	0.5
Percentile of 1986 Wealth Distribution									
0 to 10	9.8	4.1	0.0	−1.7	0.0	−4.2	−0.1	−4.5	−0.1
10 to 20	10.1	11.0	3.2	2.8	2.5	−4.7	−0.2	−5.6	−0.4
20 to 30	10.1	21.7	7.5	9.9	10.1	−9.5	1.5	−11.7	0.7
30 to 40	10.0	23.6	16.6	20.6	20.2	−1.5	4.3	−3.8	3.0
40 to 50	9.9	35.2	30.7	34.8	34.6	3.4	7.4	0.1	4.3
50 to 60	10.1	48.0	44.9	52.8	52.0	7.9	10.5	3.1	5.8
60 to 70	10.0	73.4	64.0	77.8	76.7	9.1	15.7	1.8	8.5
70 to 80	10.0	111.5	99.8	118.4	115.6	16.0	24.3	5.4	12.1
80 to 90	10.0	175.3	143.6	193.0	190.9	33.7	48.8	16.5	32.8
90 to 95	5.0	272.5	247.6	328.8	318.1	79.9	96.6	52.4	73.1
95 to 99	4.0	666.7	602.4	784.0	672.3	176.3	199.7	110.4	137.8
99 to 99.5	0.5	1,694.9	1,575.2	2,161.0	2,139.7	535.2	648.6	370.0	483.2
99.5 to 100	0.6	5,287.1	3,026.9	6,839.9	4,547.6	1,631.9	1,367.5	1,145.2	1,032.3
Housing Tenure in 1983									
Owns	35.8	26.6	3.1	36.9	6.8	9.0	1.1	6.3	0.9
Other	64.2	185.9	70.2	209.7	76.2	38.4	9.3	20.5	3.2

TABLE 7—continued

Item	% in Group	Net Wealth 1983 (1986 $1000s) Mean	Net Wealth 1983 (1986 $1000s) Median	Net Wealth 1986 (1986 $1000s) Mean	Net Wealth 1986 (1986 $1000s) Median	Saving Nominal ($1000s) Mean	Saving Nominal ($1000s) Median	Saving Real (1986 $1000s) Mean	Saving Real (1986 $1000s) Median
Had IRA/Keogh in 1983									
Yes	17.2	336.0	122.7	397.4	154.4	88.5	27.3	56.4	14.1
No	82.8	85.6	26.8	95.8	31.6	15.3	2.7	6.9	0.9
Had Thrift-Type Account in 1983									
Yes	11.2	198.9	71.4	233.3	85.1	51.2	18.9	32.0	12.3
No	88.8	120.0	34.6	137.0	39.2	24.9	3.0	13.3	0.9
Had Stocks or Mutual Funds in 1983									
Yes	20.0	366.0	123.4	422.7	154.3	79.5	17.7	44.8	10.4
No	80.0	69.4	26.4	78.9	31.0	15.0	3.0	8.1	1.2
Had Bonds in 1983									
Yes	4.5	800.0	289.5	926.5	271.7	172.8	29.2	98.1	12.3
No	95.5	97.2	34.4	111.2	40.1	21.1	3.9	11.5	1.6
Had Business in 1983									
Yes	13.6	516.7	207.6	563.3	198.0	83.0	6.2	33.7	−1.7
No	86.4	67.5	28.8	82.1	35.7	19.2	4.0	12.5	2.0
Had Investment Real Estate in 1983									
Yes	20.1	341.3	127.6	370.0	129.6	56.0	9.3	23.2	0.3
No	79.9	75.2	24.2	91.7	31.3	20.8	3.7	13.5	2.0
Had Mortgage in 1983									
Yes	37.0	177.2	68.9	213.8	77.5	49.7	13.6	32.7	7.7
No	63.0	100.4	16.8	109.1	24.5	15.1	1.6	5.3	0.5
Had Consumer Installment Debt in 1983									
Yes	48.3	100.9	30.7	126.4	40.9	32.5	6.1	23.0	3.8
No	51.7	154.9	44.9	167.7	47.2	23.5	2.4	8.4	0.2
Real Income Higher in 85 Than in 82									
Yes	47.7	115.5	32.3	148.7	42.0	42.9	7.9	31.8	5.5
No	52.3	140.9	42.0	147.0	46.3	14.2	1.5	0.5	0.0
Change in Marital Status Since 1983									
Spouse 83, no spouse 86	5.9	91.9	29.5	72.2	24.6	5.4	1.5	−2.1	−0.1
No spouse 83, spouse 86	9.0	68.5	11.0	91.2	29.7	−13.7	0.8	−20.3	−0.1
Same spouse 83 and 86	51.9	182.6	57.1	212.6	67.4	48.2	11.0	30.1	5.8
Different spouse 83 and 86	3.3	161.9	11.9	174.7	18.7	−11.7	−1.7	−22.3	−2.1
Single 83 and 86	29.9	57.0	16.0	64.1	19.2	13.9	1.4	8.3	0.2
Moved Since 83									
Yes	31.0	79.5	7.1	92.0	17.4	12.4	2.2	5.0	1.3
Homeowner	10.8	178.5	55.3	187.0	47.3	16.0	0.3	−0.2	−1.4
Other	20.2	26.9	2.3	41.6	8.0	10.5	2.6	7.8	2.0
No	69.0	150.9	53.8	172.8	59.5	34.8	5.8	20.1	2.3
Homeowner	53.4	187.3	72.4	214.3	79.7	43.0	10.7	24.7	4.9
Other	15.6	26.3	4.5	30.9	4.7	7.0	0.0	4.5	0.0

TABLE 7—continued

Item	% in Group	Net Wealth 1983 (1986 $1000s) Mean	Net Wealth 1983 (1986 $1000s) Median	Net Wealth 1986 (1986 $1000s) Mean	Net Wealth 1986 (1986 $1000s) Median	Saving Nominal ($1000s) Mean	Saving Nominal ($1000s) Median	Saving Real (1986 $1000s) Mean	Saving Real (1986 $1000s) Median
Shared Living Quarters Since 1983									
Own home	36.0	132.2	44.5	152.6	50.0	28.8	5.1	16.0	1.7
Other's home	4.9	35.8	6.9	42.7	17.1	10.9	1.8	7.4	1.6
Did not share	59.2	134.4	36.7	153.4	42.0	28.7	4.1	15.7	2.0
Received Gift/Support Since 1983									
Yes	5.0	191.5	82.1	240.0	84.2	50.2	13.2	31.8	6.3
No	95.0	125.5	35.8	142.9	42.7	26.7	4.0	14.6	1.7
Could Get Support in 1986									
Yes	63.1	165.5	54.3	194.3	65.4	39.7	9.6	23.8	5.2
No	36.9	66.1	16.8	68.4	18.7	7.7	1.0	1.1	0.0
Gave Support/Gift Since 1983									
Yes	9.5	477.2	119.7	547.5	129.6	89.4	11.9	44.6	5.7
No	90.5	92.2	32.1	105.8	37.8	21.4	3.8	12.4	1.6
Gave to Charity Since 1983									
Yes	56.5	192.8	66.1	224.8	76.2	44.4	11.9	25.9	6.3
No	43.5	45.7	12.6	47.8	16.9	6.4	1.0	1.8	0.2
College Expenses Since 1983									
Yes	12.3	263.2	104.1	297.5	129.2	50.3	20.6	24.7	11.9
No	87.7	110.0	30.8	126.8	36.0	24.8	3.5	14.1	1.3
Major Health Expenses Since 1983									
Yes	19.6	184.3	53.1	202.0	59.6	26.2	6.5	8.3	2.9
No	80.4	115.3	34.6	134.5	40.9	28.3	3.9	17.2	1.6
Bought Car Since 1983									
Yes	53.1	156.4	49.8	183.5	58.2	37.1	9.3	22.1	5.6
No	46.9	97.5	27.5	107.3	26.9	17.5	1.2	7.9	0.0
Risk Preference (1983)									
High risk	5.8	248.0	37.7	313.5	35.1	63.4	2.6	39.9	1.6
Medium risk	11.0	250.4	62.0	288.3	80.4	63.0	8.0	39.6	5.0
Low risk	37.4	155.0	59.1	178.3	70.0	34.8	10.5	19.6	5.4
No risk	44.4	60.0	23.0	63.2	27.1	7.6	1.9	1.6	0.5
No answer	1.5	167.1	11.9	229.2	21.6	63.9	0.0	50.7	0.0
Liquidity Preference (1983)									
Long period	12.7	206.7	52.6	269.7	71.9	71.8	8.4	52.4	4.1
Medium period	25.5	204.6	68.5	234.9	82.0	43.9	11.0	24.1	6.2
Short period	30.4	109.1	42.6	115.8	48.3	16.5	4.6	5.7	0.9
No time	29.5	39.7	13.4	43.5	18.7	6.3	1.4	2.3	0.4
No answer	1.9	292.7	16.2	296.7	25.5	36.8	0.2	10.2	0.0
Reason for Saving (1983)									
Buy something or for family	29.1	89.7	17.2	99.1	25.5	17.3	2.8	8.7	1.7
Retirement	15.0	170.4	91.0	198.5	100.0	44.1	12.4	27.3	6.1
Emergencies	42.5	111.1	33.3	121.6	39.7	18.0	4.2	7.1	1.7
Investment	8.8	260.2	53.5	336.8	55.9	84.3	4.1	59.7	0.5
Other	4.6	153.2	33.2	171.9	25.0	26.1	0.3	11.6	−0.2

TABLE 7—continued

Item	% in Group	Net Wealth 1983 (1986 $1000s) Mean	Net Wealth 1983 (1986 $1000s) Median	Net Wealth 1986 (1986 $1000s) Mean	Net Wealth 1986 (1986 $1000s) Median	Saving Nominal ($1000s) Mean	Saving Nominal ($1000s) Median	Saving Real (1986 $1000s) Mean	Saving Real (1986 $1000s) Median
Effect of Rise in Interest Rates (1986)									
Decrease spending	29.3	84.7	28.8	92.8	36.2	16.4	3.5	8.3	1.3
No change/ increase spending	68.1	149.6	42.6	174.4	46.7	33.9	5.4	19.3	2.4
No answer	2.7	81.6	24.8	72.9	22.6	1.4	−0.2	−6.5	−1.4
Effect of Windfall Income (1986)									
Spend all	16.4	232.9	49.0	242.7	51.5	22.6	1.0	0.8	0.0
Spend most	37.3	100.8	30.6	129.3	42.8	35.4	6.5	25.8	3.6
Spend some	29.2	110.4	37.7	124.6	43.8	22.7	4.2	11.8	2.3
Spend a little	7.5	89.5	31.1	104.1	33.9	20.4	0.5	11.4	−0.2
Spend none	8.2	150.5	53.5	167.8	50.1	30.9	4.3	15.8	0.7
No answer	1.6	123.8	41.3	131.6	41.5	19.5	1.3	7.1	−0.5
Saving Habits (1986)									
Fix saving first	24.7	111.7	40.2	129.8	51.9	27.9	6.5	17.0	3.1
Pay bills first	68.6	138.8	38.4	159.9	43.9	29.9	4.3	16.5	1.7
Does not save	5.2	60.0	16.5	60.8	9.1	7.1	0.1	1.2	−0.2
No answer	1.5	189.5	49.4	190.2	55.9	7.6	0.1	−10.8	0.0
Credit Attitude (1983)									
Good	44.6	130.6	30.7	155.1	40.8	34.2	4.4	21.8	2.1
Bad	31.5	135.6	46.8	148.3	50.0	22.7	6.2	9.5	3.1
God and bad	23.1	116.8	38.3	130.9	41.3	19.9	1.8	8.2	0.1
No answer	0.8	107.6	27.8	205.4	20.2	108.2	−0.3	97.9	−0.4
Turned Down for Credit Recently (1983)									
Yes	16.7	47.0	6.4	71.1	13.5	20.5	2.8	16.4	1.6
No and no answer	83.3	145.2	46.7	163.2	51.5	29.4	4.8	15.2	1.9
All families	100.0	128.9	37.3	147.8	44.1	27.9	4.1	15.4	1.8

Variable Definitions, Table 7

All dollar figures reported are given in 1986 dollars.

1. Age of head in 1983: age of head defined by date of birth, where the head is defined as the male of a married couple or an unmarried respondent.
2. Family income in 1982: total family income received in 1982 before taxes, including capital losses.
3. Education of head: years of education of head as of 1983.
4. Race: race of respondent in 1983 as observed by the interviewer.
5. Marital status in 1983: reported status, includes partners as married.
6. Household composition in 1983:
   Nuclear: single persons or couples living with children only.
   Extended: nuclear family living with other related individuals.
   Unrelated: all household members are unrelated to the respondent.
   Other: nuclear or extended family living with at least one unrelated individual.
7. Head in labor force in 1983: head not retired in 1983.
8. Occupation of head in 1983: standard U.S. Census summary occupation codes.

9. Pension rights of head in 1983: self-employed people were not asked about their pension rights in 1983.
10. Percentile of 1983 wealth distribution.
11. Percentile of 1986 wealth distribution.
12. Housing tenure in 1983: the "other" category includes both families that rent and those that neither own nor rent.
13. Had IRA/Keogh account in 1983.
14. Had thrift-type account in 1983: the family had some type of employer-sponsored saving account such as a 401(k) account or a profit-sharing account.
15. Had stocks or mutual funds in 1983.
16. Had bonds in 1983: includes all types of corporate and government bonds except U.S. Saving Bonds.
17. Had business in 1983: the family had some type of business with either an active or passive management role.
18. Had investment real estate in 1983: the family had any type of real estate other than their principal residence.
19. Had mortgage in 1983: the family had some kind of mortgage on the principal residence.
20. Had consumer installment debt in 1983: the family had some type of nonmortgage debt that required regular payments.
21. Real income higher in 1985 than in 1982: real total family income before taxes higher in 1985 than in 1982.
22. Change in marital status since 1983.
23. Moved since 1983.
24. Shared living quarters since 1983: includes living with children aged 22 and over.
25. Received gift/support since 1983: received gifts or support of $3,000 or more since 1983.
26. Could get financial assistance of $3,000 or more from friends or relative outside the household in an emergency.
27. Gave support/gift since 1983: gave gifts or support of $3,000 or more since 1983.
28. Gave to charity since 1983: made contributions of $300 or more to charity since 1983.
29. College expenses since 1983: paid money or took out or guaranteed loans to finance college expenses for anyone else since 1983.
30. Major health expenses since 1983: someone in the family had an illness that either required hospitalization or cost $3,000 or more since 1983.
31. Bought car since 1983: purchased any type of vehicle for personal use since 1983.
32. Risk preference (1983): question asked in 1983 about risk tolerance.
    High risk: willing to tolerate high financial risks for expected high returns.
    Medium risk: willing to take above average financial risks for expected above average returns.
    Low risk: willing to take average financial risk for expected average returns.
    No risk: not willing to take any financial risks.
33. Liquidity preference (1983): question asked in 1983 about willingness to tie up money for investments.
    Long period: willing to tie up money for long period to earn substantial returns.
    Medium period: willing to tie up money for an intermediate period to earn above average returns.
    Short period: willing to tie up money for a short period to earn average returns.
    No period: not willing to tie up money at all.
34. Reason for saving (1983): 1983 question about primary reason for saving.
35. Effect of rise in interest rates (1986). Question asked in 1986: "If the rate of interest you could earn on all your savings and investments went up by five percentage points, would you decrease the amount you spend so that you could set aside more to save, or would you make no change in your spending habits?"
36. Effect of windfall income (1986). Question asked in 1986: "If you won a cash prize equal to about three months of your usual family income, would you save all of it, most of it, some of it, a little of it, or none of it?"
37. Saving habits (1986). Question asked in 1986: "There seem to be two different methods people use to save. Some people first put aside a certain amount for savings and then use the rest for expenses, while other people first pay all their expenses and then use the rest for savings. Which of these two ways comes closest to your family's saving habits?"
38. Credit attitude (1983). Question asked in 1983: "Do you think it is a good idea or a bad idea for people to buy things on the installment plan?
39. Turned down for credit recently (1983). Question asked in 1983: "In the past few years, has a particular lender or creditor turned down any request you made for credit or have you been unable to get as much credit as you applied for?"

above 50 thousand dollars. As might be expected at this simple univariate level, variation in saving with income is much more substantial than with age.

Many other effects—occupation and ownership of various types of assets—give the expected result, but it is obvious in these cases that the results are confounded with the effects of income. Looking at the relationship between saving and other types of household change, families with higher real income and families that did not move, had a higher mean and median level of saving. Families that received support or large gifts experienced a higher level of saving, suggesting that overall the gifts may not have been made in response to pressing consumption needs, or were more than adequate to offset such needs. Similarly, families that either gave support or large gifts or who gave to charity had higher saving than average. Families that expressed a willingness to bear high risks or to tie up money for longer periods also had much higher saving. Surprisingly, families that reported that they would increase their saving if interest rates rose substantially also have a lower level of saving.

TABLE 8

REGRESSIONS OF REAL SAVING AND THE RATIO OF SAVING TO INCOME ON VARIOUS CHARACTERISTICS

t-Ratios Given Below the Coefficients

Dependent variable:	SAVER	SAVINC	SAVER	SAVINC	SAVER	SAVINC
B^2	0.3	0.15	0.07	0.17	0.04	0.03
Independent variables:						
INTERCEPT	−7,223	0.359	−9,042	0.325	14,117	0.214
	−0.1	3.3	−0.1	3.0	2.2	17.7
S-HAT	·	·	0	·	0.133	·
	·	·	10.5	·	10.8	·
S-HAT/INC	·	·	·	0.098	·	0.113
	·	·	·	7.4	·	9.5
Other variables corresponding to the rows of Table 7						

Dependent variables:
SAVER—real saving from 1983 to 1986.
SAVINC—nominal saving between 1983 and 1986 divided by the sum of nominal income for the years 1982 through 1985.

Independent variables:
S-HAT—predicted saving as defined in the text,
S-HAT/INC—S-HAT divided by total family income from 1982 to 1985,
Other variables included in Table 7.

A complete version of this set of regressions is available from the authors upon request.

In order to further decompose saving by household types, a set of regressions was run relating saving, predicted saving and a set of variables derived from the variables in Table 7 (a subset of the results is shown in Table 8).[26] When the level of real saving is regressed on predicted real saving and the set of characteris-

[26]The complete set of regressions is available from the authors upon request.

tics (column 3), predicted saving is highly significant (but with a coefficient of only 0.13), but only a few other variables (income over 50 thousand dollars, saving for investment, and membership in the ninth or tenth deciles of wealth in 1983) are significant at the 5 percent level. Indeed, the additional explanatory variables explain virtually no additional variance (column 3 vs. column 5). It appears that a substantial part of this "problem" stems from extreme values in the saving distribution (the overall standard deviation of real saving is 348 thousand dollars with extreme sample values of −38.6 million and +27.5 million dollars). When examined individually, these and other extreme values appear to be possible. No doubt, a substantial part of this variation is noise. However, this is a group that cannot be ignored or discarded. The cases where the absolute value of real saving exceeds two standard deviations from the mean account for 43.0 percent of total saving measured in the survey.

These results reinforce the necessity of considering carefully the purpose of a given model of saving behavior. If it is desired to predict the level of a variable with such a highly skewed distribution as underlies aggregate saving, then it is important to give appropriate weight to the extreme values of the distribution. The danger of the approach we have taken is that errors of measurement receive the same weight as other changes. No doubt, this affects our ability to estimate the coefficients of this model in a robust way.

Other models may be appropriate even if one is interested in predicting movements in aggregate saving. If one wanted to investigate broad behavioral relationships—e.g. how does a "typical" household save—one might want to consider a model more responsive to median behavior. Alternatively, if one had some prior belief about the proportion of noise in the data, one might want to down-weight the more extreme values in estimation. However, in very few cases would one simply discard cases, as is the current practice among many econometricians. The alternative we have chosen to investigate here is a model of the ratio of three-year saving to three-year income in terms of the same set of characteristics; this is roughly equivalent to re-weighting the cases by the inverse square of income.[27,28]

As shown in column 4 of Table 8, the additional variables explain substantial variation in this model. Using only the ratio of predicted saving to the three-year sum of income as an explanatory variable (column 6), 3 percent of variation is explained. The additional characteristics explain an additional 14 percent. Moreover, in general the coefficients of these variables do not change substantially whether or not the ratio of predicted saving to income is also used (column 2 vs. column 4). One exception is the variable representing a rise in real income, which is significant when the predicted change is not included, but not when it is included.

[27]The ratio used is the change in wealth divided by a three-year sum of a cash-flow measure of income. In principle, we would like to use the ratio of saving to a broader measure of income that included unrealized capital gains, or alternatively a measure of permanent income. So far we have been unsuccessful in constructing a useful broad income measure. As a result, the raw ratio has some very extreme values. To minimize distortion in this descriptive exercise, we have truncated the ratio at the positive and negative fifth percentile points.

[28]While such models, by construction, will not do as well as the level regressions for explaining the variance of wealth, there may be some advantages in prediction. This does not appear to be the case in the initial work we have done.

The fact that a variable is significant when predicted wealth is included suggests that the associated groups did better or worse *than expected*; both age groups over 65 and the income group over $50 thousand saved more than expected while households that had overall negative income saved less than expected. The effect of 1983 wealth on saving is negative and roughly increasing in absolute value, suggesting that there is a tendency for fortunes to decline. While the effect of the receipt or gifts is not significant, families that either gave support or made gifts to others or to charity tend to be significantly higher savers than expected. Ownership of stocks, bonds, businesses, investment real estate, and thrift-type accounts does little to explain variation, but ownership of an IRA or Keogh account does appear to increase saving significantly [see Venti and Wise (1987)]. As noted earlier, this asset had one of the largest increases of any of the assets reported.

Although there is a strong univariate difference in saving by race, this effect disappears when other variables are controlled for; however, other work in progress indicates that this finding may not be robust. A number of variables representing different forms of household change had significant explanatory power for saving. Living in someone else's home predicts higher saving.[29] Renters in 1983 who moved saved more than 1983 homeowners who moved, perhaps reflecting the fact that about half of the renters who moved became homeowners; there does not appear to be any evidence here that homeowners who buy another house use that turnover to consume part of the capital gains in the old house. Respondents who married since 1983 also saved less, but we suspect that this may be an artifact of the adjustments we have made to saving for people who married, Surprisingly, *ceteris paribus*, large expenses for health or college tuition do not appear to affect saving. Most of the attitudinal variables add little additional information. Respondents whose primary reason for saving is retirement or investments tend to save more. Respondents who said they would save any part of a windfall increment to their income tend to be higher savers, and those who would spend none of the windfall save the highest proportion of their income. This effect could be either a reflection of varying liquidity constraints or of more psychological factors connected with the discipline of saving.

V. Summary and Conclusions

We have attempted to provide a broad descriptive overview of saving in the U.S. economy as observed through the 1983 and 1986 Surveys of Consumer Finances. Only surveys with a design like that of the SCFs offer a reasonable hope of being able to disentangle the sources of aggregate variations in saving and wealth. The only other sources of information available on saving are aggregate data and very limited micro data derived from surveys that severely under-represent wealthy households. Since the distributions of saving and wealth are highly skewed, no vehicle that under-represents wealthy families can hope to provide significant macroeconomic insight.

[29]This may be a reflection, in part, of the measurement problem induced by 1983 respondents who had moved back to the home of their parents at the time of the 1986 reinterview.

Several interesting facts emerge. Saving appears to be a very noisy variable. Using a variety of models, we were unable to explain more than about 7 percent of the variation in the level of saving. However, there does appear to be a relationship between saving and a number of measures of household economic status and change. Income effects are very strong and ownership of IRAs and Keoghs appears to increase saving. Giving of gifts and changes in marital status also have power for explaining saving. Surprisingly, attitudinal variables do not appear to have strong effects when there is control for other variables, and there is little support for an aggregate view of life cycle saving.

Obviously, more work is needed both in understanding saving behavior, using both the sort descriptive models we have used, and more formally specified behavioral models. However, one fact is very clear from the patterns of correlation we have extracted so far: either the measurement error in these data is quite large, or idiosyncratic factors are very important, or both. While we hope to develop more robust descriptions of behavior, it is important to remember that if our goal is understanding aggregate saving, our model must do well in explaining mean behavior. Thus, given the skewness of the data to be explained, the model must do well at explaining the large swings in wealth that appear to be important in the determination of the mean realization. This may require a broader focus on the behavior of outliers rather than the "representative" consumer typical of many economic papers.

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