Savings and Wealth; Then and Now*

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Introduction

In this paper, we examine secular trends in household savings and wealth accumulation in the U.S. across the last four decades. On the savings side, the 1960s experienced high rates of private savings, in part providing resources for investment and growth. In contrast, the 1990s were preceded by a sharp decline in private saving, starting in the mid-1980s and continuing to the present day. In contrast to these declining savings rates, household wealth to income ratios were accelerating during the 1980s and 1990s, reaching an all time high at the end of the latter decade. We argue here that rather than being viewed as contradictory series, declining private household savings rate are a direct consequence of the large capital gains households received during the stock market boom of the 1980s and 1990s. The magnitude of recent price fluctuations in some key household assets also raises important questions about the inter-relationship between capital appreciation in alternative types of household assets and desired household savings. Our evidence suggests that the 'wealth effect' on household consumption and savings varies significantly across different types of assets with much larger wealth effects from appreciation in corporate equity shares than from other types of household assets. The failure to differentiate wealth effects across different assets has lead to an understatement of the magnitude and importance of the wealth effect on household savings.

The organization of the paper is as follows. To set a context, section 1 describes aggregate measures of savings and wealth income based on Federal Reserve Flow of Funds accounts. Section 2 uses micro-level household data from four decades to provide a description of the basic structure of wealth across households and the manner in which that structure has changed over time. In addition to exploring the extent to which time-series of household data are consistent with the aggregate series, we demonstrate that the recent sharp departure between private savings rates and household wealth is not primarily the consequence of changing demographic trends in marriage, age, and education. The final section estimates micro-models of household savings that highlight the impact of capital gains on active savings. When we differentiate different types of assets, our models indicate that the post-1983 decline in household savings can be explained by households' reaction to the receipt of significant amounts of capital gains.

Section 1.1—Savings and Wealth across the Decades: Macro Measures

Time series trends in U.S. household savings rates and wealth to disposable

household income are presented for the period 1952-1998 in Fig. 1.[1] While aggregate savings are characterized by substantial year to year volatility, our interest lies in more long-term movements. As of 1960, the NIPA measure indicates a personal savings rate of about 7%, which rose to about 9% by the late 1960s and early 1970s. The most dramatic pattern involves the most well-known: a savings rate decline from a non-recession level of about 9% in 1983-84 to close to zero by the end of the 1990s (Browning and Lusardi (1996)).

The Federal Reserve data on household balance sheets track yearly trends in aggregate household net worth as well as the components making up the aggregates. Table 1 lists total household net worth and income (expressed in 1996 dollars) obtained from balance sheet data. The final columns of Table 1 list household wealth-income ratios that were computed by dividing yearly total net worth by total income.[2] This is our best index of the adequacy of household wealth that can be derived from balance sheet data.

Based on this data, there was a 27% rise in mean household net worth from 1960 to 1968–slightly more than income per capita growth over these years so that household wealth-income ratios rose somewhat. In the six years between 1968 and 1974, however, wealth declined sharply (by 11%) at the same time as mean household income continued to rise by another 8%. Consequently, wealth/income ratios fell by almost 20%, reaching a low 3.8 in 1974. While both income and wealth were expanding only slowly between 1974 and 1983, there was a modest recovery in household wealth to income ratios (to 4.1). Between 1983 and 1994, household wealth and income once again grew at about the same pace—19%—so that asset-income ratios remained constant. Since 1994, however, household wealth jumped by 27% driving asset-income ratios to an all time high of 5.2

Table 1 demonstrates that both household income and household wealth experienced upward trends over time. However, it is the non-coincident nature of these trends—or equivalently the asset-income series that calls for an explanation. One explanation that decidedly does not fit this data involves household savings. The fact that household wealth maintained pace with household income between 1983 and 1994 and grow much faster than income since 1994 suggests that this rising wealth trend was not the result of household savings behavior as the latter was cut to almost zero.

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[1] Our household savings rates are based on NIPA defined personal savings. Alternative aggregate savings measures are available based either on savings from the flow of funds (FOF) or flow of funds savings to NIPA income definitions (FOF-NIPA). While the two flow of funds savings rates are almost everywhere above NIPA savings rates, they all exhibit similar secular patterns.

[2] In contrast, Figure 1 plots household wealth relative to disposable income.

A step toward understanding some reasons involves looking inside the sub-components of aggregate household wealth. Three important sub-components are highlighted in Figure 2, which plots shares of total household wealth represented by pension fund reserves, housing equity and the stock market (corporate equity and mutual funds). The most important secular trend involves the ever rising amounts of money in pension fund reserves. In 1959, these funds amounted to 453 billion (1996) dollars, 5% of total household wealth. By 1980, this share had doubled to 10%; then it doubled again over the next 11 years. Because these pension funds reserves typically do not appear as household assets in household surveys (including the ones used below), we re-computed balance sheet net worth subtracting out pension fund reserves.

These numbers are listed in the 2nd column of Table 1 while (net worth-pension) income ratios are listed in fifth column. Given the secular patterns just described, this adjusted net worth series increasingly departs over time from the standard net worth balance sheet numbers For example, after pensions are excluded, wealth-income ratios declined by 8% since 1960 compared to a 14% increase in the original series. Nonetheless, while this pension adjustment is important, the underlying issue still remains—a sharp post-1983 increase in wealth/income ratios while savings rates were plummeting.

The most volatile component in balance sheet accounts is stocks. Combined corporate equities and mutual funds shares comprise 22% of net worth in 1959. Fueled by the 1960's stock market boom, this share peaked at 28% in 1968. Then, equities lost almost a third of their real values in one-year (1969) fully explaining that year's one trillion-dollar decline in total household wealth. The relative equity share dropped almost 10 percentage points between those two years. This decline continued until equity shares reached a trough of 9% in 1974. The end result of this collapse was that corporate equities and mutual funds, which were worth 3.9 trillion dollars in 1968, were only $1.1 trillion in 1974.

While stocks maintained this 10% share to 1983, thereafter there was a steady persistent climb back reaching a 17% share by 1994. Then, the recent surge in equity prices increased the share of household wealth in equities to almost its mid-1960s levels. Note that the years of the sharpest drop in wealth/income ratios were years of a stock market collapse (1968-1974) while the years of the recent significant rise in wealth in proportion to income were years of a stock market boom (1983-1998). If pension fund reserves as primarily equity-based and held on behalf of households and combined with pension reserves, the wealth share in this form was 33% in 1965 and almost half by 1998.

While we have one strongly trended series (pension reserves) and one quite volatile one (stocks), the remarkable thing about housing equity is its relative long-run stability. The share of residential structures in balance sheet wealth was 17% in 1959 and 15% in 1996. Still, there were cycles that might matter especially in light of the high rate of housing ownership. Housing equity rose during the housing boom of the 1970s. While the recent decline in housing equity is mainly due to an expansion in mortgage lending, we will demonstrate below that there were key housing price cycles as well.

1.2—Explanations for Macro-Trends-Asset Prices

These sharp shifts in relative shares hint at a role for real asset prices. Two household assets with potentially volatile prices are housing and stock equity. Fig. 3.b plots real prices of a median family home relative to 1980 while Fig. 3.a plots real stock prices relative to 1947 levels. While some regional housing markets (such as California) were quite volatile, at a national level, there exists much less variation in real housing prices, especially when compared to the corporate equity market. For example, there was about a 20% run up during the 1970s. Subsequently, while there have been some modest bust and boom cycles, 1995 real housing prices were only slightly below the 1979 peak.

In contrast,[3] real equity prices almost doubled between 1955 and 1968, lost virtually all of that gain by 1974, languished at this level until 1983, and then started a steady uphill climb until inflation adjusted prices had doubled again by 1994. Then, real equity prices more than doubled again in the last four years. The end result is that since 1983 there has taken place a quadrupling of real prices in the American stock market.

The size of these price fluctuations in the equity market may have had important consequences for trends in aggregate household wealth as well as the distribution of wealth across households. For example, the inflation-adjusted decline in total wealth as well as the collapse of the equity share in total household wealth in the early 1970's was coincident with the collapse in equity prices during those years. Similarly, the steady post-1983 climb back in equity shares and the maintenance of wealth-income ratios in spite of falling savings rates took place alongside a sharply rising equity market over that period. The magnitude of these capital gains can translate into considerable changes in total household wealth. Even, a 20% equity share would imply a post-1983 80% increase in total household

[3] Counter-balancing small price cycles in housing compared to those in equities is the much more widespread home ownership compared to stock ownership. However, with the increase in stock ownership, this is becoming less true. The result is that total household wealth has become much more volatile.

wealth. Since there exist considerable variation across households in the fraction of their wealth held in equities, households with large equity shares may have experienced impressive wealth gains especially in recent years while those with little or no involvement in corporate equity were left behind.

1.3—Explanations for Macro-Trends--Age and Marriage

Before dealing with the role of capital gains on household savings, we discuss two demographic forces that may have influenced trends in household assets and income-age distributions and rates of family formation. Since both household wealth and income have distinctive age-gradients, wealth and wealth-income ratios may be sensitive to shifts in the age distribution. For example, wealth at age 50 is about twice as high as population wealth and about 10 times higher than wealth of those household heads under age 35. Because the wealth-age gradient is much steeper than the income-age gradient, wealth-income ratios are also influenced by age composition.

Shifts in the population age distributions over this period are largely a product of the relative size of the baby-boom and baby-bust cohorts.[4] The third column of Table 1 adjusts the net worth minus pension series by normalizing it to the 1989 age distribution while the final column performs a similar adjustment for wealth-income ratios. Relative to 1989, the American population was older in 1960, and thus age adjusted net worth would have grown by 45% compared to a 36% real change in the unadjusted series between 1960 and 1989. Compared to 1989, the population was also older in 1998, so that age adjustments also lowered 1998 net-worth per household. Yet, while age trends did impact aggregate trends in household wealth, they do not offer an explanation for either the collapse of wealth/income ratios in the early 1970s or the recent sharp increase in these ratios.[5]

The second demographic trend involves the steady decline in the fraction of all households who are married. More than three in every four households were married in 1955; by 1998 only 54% were. Marriage affects wealth accumulation most directly by combining the separate assets of men and women into a single unit so that, on average, married households have twice the wealth of single households. Moreover, there is some evidence that marriage may encourage additional household savings beyond the sum of what the two partners would have done individually (see Smith (1999)).

[4] In addition to prior fertility, the age-distribution of household heads is sensitive to prevalence and age of marriage.
[5] Parker (1999) also concludes that shifting age structures did not produce the recent consumption boom. Parker did not examine the impact of either marital status or education distribution.

Even without behavioral effects on savings, marriage can alter trends in asset accumulation per household. With no behavioral effects, total population wide household wealth remains unchanged, but the number of households is altered. Each marriage dissolution essentially adds one additional household to the population. If marriage rates were maintained at 1989 levels, there would have been 6 million more households in 1955, an increase of 13%. Alternatively, total wealth per household would have grown 13% more between 1955 and 1989 if there had been no change in family structure.

This effect of marriage would be eliminated by per-capita measures, but that raises the conceptually difficult question of allocating household wealth among individuals. Alternatively, the third column of Table 2 provides measures of mean household wealth normalizing marriage rates at their 1989 values while the forth column adjusts for both changes in age and marriage rates. The downward trend in marriage formation attenuated secular growth in mean household wealth by an even greater amount than the shifting age distribution did. Combined, these two demographic adjustments do strongly influence wealth trends. If marital formation and age distributions did not change, real household wealth would have increased by 55% between 1960 and 1989, 20% more than the increase over those years. However, and most important, these two demographic trends do not explain the central issue in this paper—the post-1983 sharp increase in wealth/income ratios when savings rates were declining.[6]

Section 2.1—Wealth Holdings and Transitions: 1962-1994: Data Sources

Aggregate data on wealth are inherently limited because they cannot speak to the underlying structure of wealth variation across households. To examine such variation and to span as long a time period as possible, we utilize data from three micro surveys that share sufficiently similar design features so that they are approximately comparable. Combined these surveys enable us to examine both current birth cohorts and their counterparts 30 years earlier. These data sources include the Panel Study of Income Dynamics (PSID); the Consumer Debt Panel (CDP), and the Survey of Financial Characteristics of Consumers (SFCC). These data sets have unique features that need to be carefully examined to insure comparability.

The PSID has gathered almost 30 years of extensive economic and demographic data

[6] Changes in the number of households affects both income and wealth per capita proportionately so that, wealth-

on a nationally representative sample of approximately 5000 (original) families and 35,000 individuals living in those families. PSID wealth modules, included in the 1984, 1989, and 1994 waves, measure net equity in homes and non-housing assets divided into seven categories: other real estate, vehicles; farm or business ownership; stocks, mutual funds, investment trusts and stocks held in IRAs; checking, savings accounts, CD's, treasury bills, savings bonds and liquid assets in IRA's; bonds, trusts, life insurance and other assets; and other debts. These wealth modules also include questions about purchases and sales so that in principal active and passive (capital gains) savings can be distinguished.

CDP was a study of 1,434 families conducted annually between 1967 and 1970 by the University of Michigan. Individuals were questioned yearly about their previous year's income by source, their labor force status, family composition, and detailed components of the current value of their assets and liabilities.[7] The CDP has some features that limit the kinds of comparisons that are possible. For example, it does not have any households over the age of 60, and hence cannot be used to make comparisons of older populations between the 1960s and 1990s. In addition, CDP does not include as a component of household wealth the market value of equity in the respondents' business or farm; rather it includes only that part of business equity represented by the value of actual physical property.[8]

The SFCC, a precursor to the series of Survey of Consumer Finances (SCF's), was based on a sample of 2,557 families whose wealth was measured as of Dec. 31 1962. Assets and debts were grouped into six major wealth components—home equity, autos, business assets, liquid assets (checking and savings accounts and U.S. savings bonds) and investment assets (stocks and bonds) and assets held in personal trusts. The SFCC results reported in this paper are taken from those published in Projector and Weiss (1966).[9]

While they differ in the details, the three surveys share much in common. All are based on nationally representative samples, collect data on similar components of wealth,

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income ratios are independent of our marriage adjustments.

[7] See Smith and Ward (1980) for a detailed description of the CDP. The1967 wave only asked households to report the value of their assets within pre-specified ranges. In the 1968 and 1969 versions, respondents were asked exact values, but there were no special provisions for handling item non-response, which is widespread in household wealth surveys. The 1970 data did not repeat questions on home and business value for non-buyers or sellers. Therefore, only the 1968 and 1969 waves of the data allow estimation of household wealth. Since they are only a single year apart and quite similar, we report data from only the 1968 wave.

[8] CDP wealth includes net equity in home, net equity in cars, total installment and non-installment debt, and financial assets held in checking, savings, certificate of deposits, stocks and bonds minus the amount owed on stocks.

[9] As a result, Tables 2.a and 2.b have missing values for certain sub-groups.

and span most of the age distribution. However, there are some differences[10]. Since CDP only included households under age 60 and business equity was not asked in that survey, the data for all other surveys must be limited to ages 25-60 and the value of business equity is excluded from the other surveys. Another difference is that the PSID introduced the use of unfolding bracket techniques to deal with non-response to wealth questions. By limiting the range of the unknown wealth values, unfolding brackets have been shown to increase measures of mean wealth in surveys by about 10% (Juster-Smith (1997)). We discuss the implication of this difference for survey comparability in the next section. [11]

2.2—The Structure of Wealth Holdings: 1962-1994

Tables 2.a and 2.b summarize changing structures of wealth and wealth-income ratios where households are stratified by the age, education, and marital status of the household head.[12] Given the skew in wealth holdings, whenever possible, median and mean values of net worth are presented. The first row of Table 2.a displays wealth trends across all families. To facilitate comparisons with FOF data, the second and third rows list mean wealth from household surveys as a percent of the FOF non-pension wealth from the same year.[13] Numbers in the second row (1.a) cover the age groups 25-60 and exclude business equity while those in the third row (1.b) cover all age groups and include business equity.

Although wealth levels are lower in household surveys, the relatively constant ratios in rows 1(a) and 1(b) in Tables 2 (a) and 2 (b) indicate that mean wealth and wealth-income ratios in household surveys track secular trends in mean FOF wealth reasonably well. Mean household wealth, as a fraction of FOF wealth for our restricted age sample over these thirty-plus years is centered around 50%.[14] There appears to be about a 10% upward

[10] SFCC attempted to sample high income households, but that attempt is widely viewed as unsuccessful. For example, one a third on their high income sample participated in the survey and most did not answer the wealth questions. Unlike the new SCFs, which come close to matching FOF measures of mean wealth, SFCC estimates are only half as high- similar to the range of surveys without high income over samples.

[11] One might wonder why we have not selected SCF surveys, which provide the most detailed measurement of household wealth. Because wealth is known to be extremely positively skewed, SCF combined a representative area-probability sample with an over-sample of high income households obtained by a match with IRS records. But our aim here is not to match in any given year with wealth levels contained in FOF data, but rather to insure that secular trends are not distorted by changing survey designs over time. While SCF high income over-samples produce a much closer match with FOF data, they introduce serious issues of non-comparability with the other surveys. Moreover, there are questions of non-comparability even within the set of SCF surveys. Given the extreme skew in the upper tail of the wealth distribution, estimates of SCF mean wealth are very sensitive to the particular sample that happens to be chosen in any year. As a result, time series trends using the SCF surveys do not match well wealth trends using FOF data (see Juster, Smith, and Stafford 1999).

[12] To preserve comparability with FOF data, these ratios are ratios of the averages.

[13] Since pensions are not in the household data, we use FOF measures excluding private pensions.

[14] There are three reasons why household wealth measures are roughly only half of the FOF measure. The survey

shift in survey wealth as a percent of FOF wealth, consistent with estimates of the impact of unfolding brackets on mean wealth (Juster-Smith (1997)). Still, the range of the percents in the second and third row do indicate that these household surveys provide a reasonable basis for detecting secular shifts, especially if the structural change is sufficiently large.[15]

Paralleling FOF wealth, household wealth increased across these thirty years while wealth/income ratios were falling. The growth in mean household wealth exceeds that in median wealth indicating that (similar to income) wealth inequality was rising over these years. In fact, growth in dispersion was greater in wealth than in income resulting in a larger growth in mean wealth-income ratios than in median wealth-income ratios.

Rows 4 through 6 of Tables 2 sequentially adjust trends in household wealth for secular changes in the age, marital status, and education distributions of these samples. All values are normalized to 1989. Once again, fixing the age distribution at 1989 levels leads to a much larger secular increase in household wealth and smaller declines in wealth/income ratios. Especially between 1968 and 1984, the declining fraction of married households was also an important force in slowing growth in mean levels of household wealth. For example, mean household net worth in Table 2 would have grown by twice as much if the age and marital status distribution had remained unchanged.[16]

The final adjustment relates to schooling. More educated households have larger wealth and higher savings rates than less educated households do so secular growth in schooling increases wealth levels. A comparison of the fifth and sixth rows of Table 2.a indicates that increases in schooling accounts for a third of the age and marital status adjusted increase in wealth. Yet, after adjusting for changing age, marital status and schooling distributions, the same question remains. Since 1984 wealth levels were rising

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based data (1) do not over-sample the extremely wealthy; (2) do not include business equity; and (3) restrict age of the household head to less than 60, thereby excluding older households who are on average wealthier than others.

[15] To compare PSID to FOF more fully, the full PSID age sample should be used (row 1.b in Table 2.a and 2.b). This row shows that PSID net worth averaged about 72% of the FOF net worth without pensions indicating that about 40% of the PSID discrepancy with FOF wealth in row 1.a was due to the age restriction and elimination of business wealth. The remainder is due to the absence of a high income over-sample in the PSID. Juster, Smith and Stafford (1999) show that with the exception of wealthiest one percent of households, PSID wealth averages over 90% of FOF. Using row 1.b, trends in wealth in the PSID and FOF are quite similar. Both PSID and FOF measures show an increase in wealth between 1984 and 1989 followed by a decline between 1989 and 1994. The absence of any decline in Table 2.a is apparently due to the age restriction in that table. The correspondence between wealth income ratios in the full PSID sample and FOF are even more exact (row 1.b in Table 2.b).

[16] The marital status adjustments in Table 2 are conceptually distinct from those in Table 1. In Table 1, we assumed no behavioral effects only allowing marriage to alter the number of households. Here, the adjustment asserts that the average married household would have the same wealth (and income) of the average non-married households if the marriage dissolved (no selection effects). Thus, the adjustments in Tables 2 represent an upper bound estimate

alongside a rapidly falling private savings rate. The resolution of this issue lies elsewhere.

Examining the changing structure of wealth across households may help point us toward an answer. This changing structure is a tale of two gradients—age and education. Since within cell patterns are volatile, medians may be a better metric to describe trends. In 1968, median household wealth of those 55-60 years old was 4.2 times that of those 25-34 years old; by 1994, the older households had 9.4 times as much wealth as did younger households. A similar tilt in the age gradient took place with decreasing household wealth-income ratios rates for younger households alongside increasing rates for older households.

At the same time, a similar shift was taking place in the wealth-schooling gradient. While median household wealth was actually falling among those with a high school degree or less, it was either rising or stable for those with a college degree. In 1968, median wealth of college graduates was 2.8 times that of those who were not high school grads; by 1994, this ratio had risen to 6.8 times. For both older and more educated households, increases in wealth since 1984 appear to be larger when means are used in place of medians suggesting that wealth gains were unevenly distributed within these groups.

The changing age patterns of household wealth holdings over time make it natural to rearrange the data so that across and within cohort trends can be highlighted. This is presented in Tables 3a and 3b which follow 10 year birth cohorts starting with those born in 1921-1930 and ending with those born between 1961 and 1970.[17] Within cohorts, wealth has risen very rapidly with age, far more so than household income. Moreover, this expansion in wealth with age is much greater among those who went to college and far steeper in mean than in median wealth. Indeed, mean wealth increments across the ten years between PSID wealth modules are so large that savings of these cohorts represent a quite unlikely explanation. To illustrate for those who had attended college, mean wealth increased on average by about $25,000 per year for those 54-63 years old in 1984 and by about $10,000 per year among those 44-53 years old in 1984. These households would have had to save up to a third of their income to produce these wealth increments which they clearly did not do. In fact, their savings were actually falling between 1984 and 1994.

The data summarized in Tables 2 and 3 support the idea of a significant structural shift in household wealth accumulation—with lower wealth relative to income among the

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of the effect of marriage. For an analysis of the savings promotion effects of marriage (see Smith (1999)).

[17] The positive correlation of wealth and mortality implies that aggregate consumption grows more rapidly with age since higher consumption households are more likely to survive at older ages (Attanasio and Hoynes (1996))

young and the less schooled and corresponding higher wealth relative to income among older and more educated households. A plausible explanation for the increasing tilt to the age and education wealth gradients rests on the potentially large role of capital gains in equity markets since 1983. Capital gains impart benefits in proportion to past holdings. Older households have had more time to accumulate wealth and the better-educated as well as older households typically have a larger share of their portfolios in equity. Thus, both groups had high exposure to capital gains or losses and the new structure of wealth holdings across households largely reflects the fact that this was an era of huge capital gains rather than capital losses. The central question that remains concerns what impacts these large capital gains had on household saving behavior.

Section 3—Models of Active Saving

In this section, we present estimates of the impact of capital gains on household saving using the three PSID waves that include wealth modules. How households respond to a positive unexpected capital gain depends on their expectations regarding future capital gains (Deaton 1992). Although a structural examination of household saving would explicitly take household expectations into account, our results are more data descriptive. If there is no persistence to the shock, an unexpected change in the rate of capital gain provides a one-time wealth shock (an increase in non-human wealth) that does not alter the inter-temporal price of consumption or the discounted value of future labor income. All else equal, this will lead to an increase in consumption and an equal fall in saving since unrealized capital gains are not included in what is traditional defined as total income.

If households believe instead that the capital gain came from a permanent increase in the rate of capital gains, the effects on consumption and hence savings are ambiguous since the expected rate of return is the inter-temporal price of consumption as well as the discount term for future labor income. The extent to which the persistence is temporary will diminish the human wealth effect as well as the inter-temporal substitution effects so that the initial non-human wealth effect may still dominate for even temporary changes in the expected rate of capital gains.

The capital gains used to obtain the empirical results described below are clearly a combination of expected and unexpected gains in the housing and corporate equity markets. The effects of capital gains on savings depend also on whether we believe a martingale process governs corporate earnings or the interest rate. If the former, the saving response

of households to capital gains in stocks should largely reflect the non-human wealth effect as a result of a wealth shock.[18] If the latter, the impact of an inter-temporal price change must also be considered.[19]

Household saving can be measured in panel surveys as the between wave differences in household wealth, adjusted for any capital gains or losses and net transfers into the household. Such adjustments are necessary as there are wealth increments when individuals originally outside the household join, and wealth decrements when some family members leave. Similarly, a family may receive inheritances in the form of new assets, and money may be withdrawn from pensions and added to household wealth. Finally, wealth increments due to capital appreciation must be distinguished from active saving.

These distinctions can all be empirically implemented in the PSID. Based on a sample of PSID households with the same household head in 1984, 1989, and 1994, total changes in household wealth between 1984, 1989, and 1994 were computed. Net wealth transfers into the household were defined as the sum of money taken out of pensions, the value of new inheritances received, and assets brought in by new family members minus any assets previous family members took with them when they left. The PSID includes a short transaction module which asks the amount of money put into real estate or business, net transfers into stocks, bonds, and annuities, allowing one to separate so called active saving from wealth accumulation that is a consequence of capital gains. Total capital gains are defined as the change in the total value of stocks, businesses, and real estate minus the

[18] Households have more forecast ability of capital gains in housing since this asset is lumpier than a portfolio of stocks, which can be bought and sold with relative ease. A household may be able to forecast upward or downward trends in their house value and adjust their saving accordingly. With the increased liquidity of housing wealth, it should not be surprising that an unexpected capital gain is quickly and easily converted into consumption if the household so desires. However, if some gains and losses in housing over the 1984 to 1994 period were expected, this could explain the statistically insignificant result for the effect of housing gains on saving in Table 6.

[19] To examine these issues, we estimated one-step ahead forecasts from 1984 to 1998 using an AR (1) model on the percent change in the S&P 500 Index of common stocks where the model is re-estimated each period using the data from 1955 to the most current information. Our results indicate that between 1984 and 1994 the total return on stocks was 93% while the expected return was 26%. Over the longer period 1984 to 1998, the total stock return was 322% while the expected return was 55%. In either case, this model suggests that a significant part of the recent stock market return was not anticipated. These equity price increases were also not a result of a switch in corporate policy from dividends to retained earnings. Our examination of equity price trends indicates that the 1.4% fall in dividend yield between 1984 and 1994 was a result of rising stock prices not of changes in dividends. Our model also predicts a slight rise of 1.5% in the expected yearly return from 1984 to 1994.

The important caveat to this analysis concerns what the appropriate past time span is over which households make such forecasts. A longer horizon than 1955 would increase the expected return while a shorter horizon than 1955 would decease it. In the end, we must rely less formally on the uniqueness of the magnitude of the post 1983 equity price surge to argue that a significant part of the return was probably not expected. Moreover with only two periods of active savings and capital gains in the PSID data, modeling these expectations within the PSID

net amount a household puts into these assets between waves. This data provide two observations of active saving and capital gains for each household, i.e. from 1984 to 1989 and from 1989 to 1994.

Table 4 lists mean changes between 1984 and 1994 in total net worth, active and passive saving, and net transfers. Over this period, the mean change in total household wealth was $50,800 with capital gains representing 17% of that wealth increase. Mimicking conventional findings in the literature, wealth accumulation is concentrated in middle aged households and among the more educated especially college graduates. Moreover, as a proportion of wealth increments, capital gains are quantitatively more important among middle age households (one-third of wealth change for those 55-64 years old and among college graduates (about one-fourth).

Wealth transfers into and out of the household are not trivial. Between these ten years, there was a net wealth transfer into the household of $8,600, approximately 17% of the total change in household wealth. This component of wealth change represents neither active saving nor capital gains. While these net transfers are an important part of total wealth change, unfortunately it is not possible in the PSID to know which part of net transfers appears as active and which part appears as passive saving. To deal with this problem, we include in our model measures of these between wave net transfers.

To demonstrate the importance of net transfers and passive savings, the fifth column of Table 4 lists household wealth change minus net wealth transfers into the household. In this table, the largest number in each column is placed within an oval. Instead of peaking in the age 45-54 age group, the peak in household wealth changes now occurs among those 35-44 years old. The final column in Table 4 presents an adjusted active savings series computed by assuming equal proportionate effects of net transfers on active and passive savings. The peak in active savings now is among those 25-34 years old. The life-cycle curvature of household savings behavior is critical in testing alternative economic savings models. That curvature is clearly sensitive to adjustments for net transfers and capital gains.

Table 5.A highlights a possible relation between household active saving and capital gains in stocks by arraying within sub-period values across the same demographic variables (indexed by 1984 values) used earlier. A number of patterns are suggestive of a possible

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data is not yet feasible.

connection between the two. For example, stock capital gains were larger (and active saving lower) between 1989-1994 than between 1984 and 1989. Similarly, capital gains were concentrated among those 45–64 years old in part as they had a longer time to accumulated stocks by 1984 and typically hold a larger share of equity in their portfolio relative to other age groups.[20] But these are the same age groups that experienced the largest across period drop in active saving.[21] Finally, by far the largest increase in capital gains were among college grads- who simultaneously reduced their active saving by a third.

The data listed in Table 5.b derived from the Health and Retirement Survey, representing households in their fifties also indicates a possible effect of capital gains on active savings. In this table, we have divided these similarly aged households in household income deciles. Not surprisingly, households in the highest two income deciles received the largest capital gains. But these are the same households who on average reduced their active savings the most.

While these results are suggestive, multivariate modeling is necessary to isolate this relationship. There are several key statistical issues that must be addressed in such modeling. First, it is well known that there exists considerable heterogeneity in saving behavior among what appear to be observationally equivalent households (see Venti-Wise (1999)). Some households even with the same lifetime income are savers while others are not. Such heterogeneity implies a strong positive association across households between active and passive saving. Households who are active savers every year will have accumulated considerable wealth, thereby increasing their exposure to the possibility of capital gains and losses. Thus, across-household estimates of the relation between active and passive saving would not be informative about the consequences of capital gains on saving for an individual household. Our estimates are based instead on within-household changes in active saving. These changes are measured as the difference in active saving between the 3rd and 2nd PSID wealth module (1994 and 1989) compared to active saving between the 2nd and 1st PSID wealth module (1989 and 1984). All models are estimated

[20] For an empirical description of portfolio composition over the life-cycle using the Survey of Consumer Finances see Poterba and Samwick (1997).

[21] This result is consistent with recent findings of Attanasio (1998) who reports that the decline in aggregate savings was concentrated on birth cohorts who were in their forties and fifties during the 1980s. Because of their age, capital gains would have been concentrated in these cohorts. Attanasio does not offer an explanation for this concentration. He tests and rejects a capital gains effect using a dummy variable for positive interest income.

using a sample of PSID households who were members of the survey in all three waves.[22]

Another set of issues stems from measurement error in household wealth, active savings, and capital gains. In particular, there is the possibility of an artificially induced negative correlation between capital gains and active savings due to measurement error alone. Household wealth is measured with considerable error, and the same is certainly true of active savings. If active savings are measured with error, then given a change in wealth, a positive error in active savings will necessarily lower measured capital gains by an equal amount, biasing any estimate of the capital gains effect toward finding a more negative effect.

To formalize our model, we have a panel of households for the years 1984, 1989 and 1994 which provides us with two periods of savings and capital gains (1984 to 1989 and 1989 to 1994). For simplicity, assume we only have two assets that sum to total household wealth. In the second and third wave, we obtain active saving information over the previous period in each asset. We allow all wealth variables to be measured with error. First, consider estimating the effect of total capital gains on total active saving. The model we have in mind is:

$$S_{it} \approx \beta_0 + \beta_1 G^*_{it} + \beta X_{it} + \alpha_i + \eta_{it} \qquad \eta \sim F(\theta) \tag{1}$$

where X_{it} is a vector of household characteristics which includes such things as permanent income as well as other demographics and α_i is an unobservable household fixed effect, i.e. some households my be 'savers' while others may not. It is likely that this household specific fixed effect is also correlated with other household characteristics and more importantly with capital gains, G^*_{it}. This problem is dealt with below.

For each household i=1,2, N, our data is (i suppressed throughout this section):

$$\begin{aligned} S_t &= S^*_t + \phi^S + \varepsilon_t \qquad t = 1,2 \\ W_t &= W^*_t + \phi^W + \mu_t \quad t = 0,1,2 \end{aligned} \tag{2}$$

where S^*_t and W^*_t are the true values of active saving and total wealth and ε_t and μ_t are

[22] Another perennial problem stems from the non-significant measurement error in household wealth (see Juster-Smith (1997)). To eliminate gross outliers from the sample, we trimmed the top and bottom distributions of each component of saving and capital gains by excluding the top and bottom 50 cases. Our final sample consisted of 3008 households. The main result from our analysis, the magnitude of the impact of capital gains on active saving, is not sensitive to alternative trims.

measurement errors with variances $[\sigma^2_{\varepsilon_1}, \sigma^2_{\varepsilon_2}, \sigma^2_{\mu_0}, \sigma^2_{\mu_1}, \sigma^2_{\mu_2}]$.[23] We allow for some households to consistently misreport their household saving and wealth leading to a non-zero mean total error, ϕ^S and ϕ^W respectively.

Capital gains are defined as

$$\begin{aligned} G_t &\equiv W_t - W_{t-1} - S_t \\ &= G_t^* + \left(\mu_t - \mu_{t-1} - \phi^S - \varepsilon_t\right) \quad t = 1, 2 \end{aligned} \tag{3}$$

Our goal is to estimate the effect of $G_t^* \equiv W_t^* - W_{t-1}^* - S_t^*$ on S_t^*. The problem that could bias our results is that capital gains are measured with error and in particular, that one component of error moves one-for-one with the error in active saving. Also, note that while the fixed mis-reporting error is eliminated from wealth, it remains for now in the saving errors. To control for the fixed behavioral effect of saving which may be correlated with capital gains, as well as the fixed mis-reporting error of saving, we examine only within household variation-the relationship between how the saving of each household responds, or changes, to the change in their own capital gains. We thus define:

$$\begin{aligned} \Delta S &\equiv S_2 - S_1 = S_2^* - S_1^* + \varepsilon_2 - \varepsilon_1 = \tilde{S} + \upsilon \\ \Delta G &\equiv G_2 - G_1 = \left(W_2^* - 2W_1^* + W_0^*\right) - \left(S_2^* - S_1^*\right) + \left(\mu_2 - 2\mu_1 + \mu_0 - \varepsilon_2 - \varepsilon_1\right) = \tilde{G} + \varpi \end{aligned} \tag{4}$$

where $\tilde{S} \equiv S_2 - S_1 = S_2^* - S_1^*$ and $\tilde{G} \equiv (W_2^* - 2W_1^* + W_0^*) - (S_2^* - S_1^*)$. Although we wish to estimate the effect of $\tilde{G}$ on $\tilde{S}$, the two are measured with error since we only observe ΔG and ΔS. Consider the following regression suppressing for expositional simplicity variation in X:

$$\Delta S = \beta \Delta G + \Delta\eta \,. \tag{5}$$

The best linear unbiased estimate of β with no measurement error would be given by

$$\hat{\beta}^* = \mathrm{Cov}\left[\tilde{S}, \tilde{G}\right] \mathrm{V}\left[\tilde{G}\right]^{-1} \tag{6}$$

However, our estimate will be given by

$$\hat{\beta} = \mathrm{Cov}\left[\Delta S, \Delta G\right] \mathrm{V}\left[\Delta G\right]^{-1} \tag{7}$$

Substituting back in the actual error term variances[24], we get

[23] All errors are assumed to be independent from each other. While this assumption is not necessary, it greatly simplifies the stylized exposition of the measurement error effect on our estimates. However, a similar but not identical assumption will be used to eliminate the mechanical bias introduced by the error in active saving. More is said to this point below.

[24] Our estimate of β is

$$\hat{\beta}=\hat{\beta}^{*}\left(\frac{\mathrm{V}\left[\tilde{G}\right]}{\sigma_{\mu_2}^2+4\sigma_{\mu_1}^2+\sigma_{\mu_0}^2+\sigma_{\varepsilon_2}^2+\sigma_{\varepsilon_1}^2+\mathrm{V}\left[\tilde{G}\right]}\right)-\left(\frac{\sigma_{\varepsilon_2}^2+\sigma_{\varepsilon_1}^2}{\sigma_{\mu_2}^2+4\sigma_{\mu_1}^2+\sigma_{\mu_0}^2+\sigma_{\varepsilon_2}^2+\sigma_{\varepsilon_1}^2+\mathrm{V}\left[\tilde{G}\right]}\right) \quad (8)$$

There are two effects of measurement error. The first term is the standard attenuation bias as a result of classical measurement error (the first term factor ratio on $\hat{\beta}^{*}$ is less than one). More unique to the current estimation problem is the second term. Since this term is positive, the effect will be make our estimate more negative. This error flows solely from measurement error in active saving and the definition of capital gains above. If there were no measurement error in active saving, we would only be left with the classical error.[25] In general, the two sources of bias operate in opposite directions, and it is not possible a prior to determine the direction of the overall bias.

While eliminating the effects of the attenuation bias in (8) is quite difficult (finding proper instruments seems to be somewhat allusive in our view), we can eliminate the second source of bias which is a more critical problem in our application as it biases towards a larger negative effect. Our method utilizes the availability of active saving and capital gains in multiple assets. A closer look at the analysis above indicates that this bias is a result of the covariance in $\mathrm{Cov}[\upsilon,\varpi]=-(\sigma_{\varepsilon_2}^2+\sigma_{\varepsilon_1}^2)$, which stems from the relationship between defined capital gains and active saving. The solution is to eliminate this covariance by eliminating from active saving the assets whose capital gains in which we are most interested, namely publicly held corporate equities.

Consider the model introduced above in which we have two assets. Now, we make explicit the fact that saving and capital gains are sums across these two assets. We observe the saving and level amounts of these two assets for each household:

$$\begin{aligned}\hat{\beta}&=\left(\mathrm{Cov}\left[\tilde{S},\tilde{G}\right]+\mathrm{Cov}[\upsilon,\varpi]\right)\left(\mathrm{V}\left[\tilde{G}\right]+\mathrm{V}[\omega]\right)^{-1}\\&=\hat{\beta}^{*}\left[1-\frac{\mathrm{V}[\omega]}{\mathrm{V}[\omega]+\mathrm{V}\left[\tilde{G}\right]}\right]+\frac{\mathrm{Cov}[\upsilon,\varpi]}{\mathrm{V}[\omega]+\mathrm{V}\left[\tilde{G}\right]}\end{aligned}$$

[25] Including the full set of regressors, our estimate for β_1 is:

$$\hat{\beta}=\frac{\left(\mathrm{Cov}[\tilde{S},\tilde{G}]+\mathrm{Cov}[\upsilon,\varpi]\right)\mathrm{V}[X]-\mathrm{Cov}[X,\tilde{G}]\mathrm{Cov}[X,\tilde{S}]}{\mathrm{V}[\tilde{G}]\left(\mathrm{V}[\varpi]+\mathrm{V}[\tilde{G}]\right)-\mathrm{Cov}[X,\tilde{G}]^2}$$

The qualitative effect of measurement error upon $\hat{\beta}$ is the same as the analysis in the text, i.e. there is a standard classical attenuation bias as well as the mechanical bias.

$$
\begin{aligned}
S_{kt} &= S^*_{kt} + \phi^{S_k} + \varepsilon_{kt} \quad k = 1,2 \;\; t = 1,2 \\
A_{kt} &= A^*_{kt} + \phi^{W_k} + \mu_{kt} \quad k = 1,2 \;\; t = 0,1,2
\end{aligned}
\tag{9}
$$

where both are measured with error. Along with the fixed mis-reporting errors, ϕ^{S_k} and ϕ^{W_k}, we assume that ε_{kt} and μ_{kt} are all mean zero with variances $\sigma^2_{\varepsilon_{kt}}$ and $\sigma^2_{\mu_{kt}}$. In addition to temporal independence we also assume that the errors across assets are independent. Not observing actual capital gains, we define them as their equivalent definitional counterpart:

$$
\begin{aligned}
G_{kt} &= A_{kt} - A_{kt-1} - S_{it} \\
&= G^*_{kt} + \left(\mu_{kt} - \mu_{kt-1} - \phi^{S_k} - \varepsilon_{kt}\right) \quad k = 1,2 \;\; t = 1,2
\end{aligned}
\tag{10}
$$

where $G^*_{kt} \equiv A^*_{kt} - A^*_{kt-1} - S^*_{kt}$. The previous goal above was to estimate the effect of total capital gains, $G^*_t = \sum G^*_{kt}$, on total saving, $S^*_t = \sum S^*_{kt}$. We now attempt to determine the effect of capital gains in asset 2 on saving in asset 1 only. More will be said to the implications of this methodology below. Still controlling for the fixed effects in our saving equation, we examine first differences but only for saving in asset 1 and capital gains in asset 2:

$$
\begin{aligned}
\Delta S_1 &\equiv S_{12} - S_{11} = S^*_{12} - S^*_{11} + \varepsilon_{12} - \varepsilon_{11} = \tilde{S}_1 + \upsilon_1 \\
\Delta G_2 &\equiv G_{22} - G_{21} = \left(A^*_{22} - 2A^*_{21} + A^*_{20}\right) - \left(S^*_{22} - S^*_{21}\right) + \left(\mu_{22} - 2\mu_{21} + \mu_{20} - \varepsilon_{22} - \varepsilon_{21}\right) = \tilde{G}_2 + \varpi_2
\end{aligned}
\tag{11}
$$

The key difference between (11) and (4) the covariance in (11) is zero by the measurement error independence assumption between assets in a given time period.

We now consider the stylized example of regressing ΔS_1 on ΔG_2. Given the result from (14), the covariance between the two variables reduces to $\mathrm{Cov}[\Delta S_1, \Delta G_2] = \mathrm{Cov}[\tilde{S}_1, \tilde{G}_2]$. Our estimate of the effect of ΔG_2 on ΔS_1 then reduces to[26]

$$
\hat{\beta} = \hat{\beta}^* \left(\frac{\mathrm{V}[\Delta G_2]}{\sigma^2_{\mu_{22}} + 4\sigma^2_{\mu_{21}} + \sigma^2_{\mu_{20}} + \sigma^2_{\varepsilon_{12}} + \sigma^2_{\varepsilon_{11}} + \mathrm{V}[\Delta G_2]} \right). \tag{12}
$$

The mechanical bias no longer exists and we are left only with the attenuation bias.

Since our focus is on the effect of capital gains in publicly help corporate equities on saving in the U.S., we eliminate the mechanical bias of our estimate introduced by measurement error by estimating the effect of capital gains on saving in assets other than

---

[26] $\hat{\beta} = \mathrm{Cov}[\Delta S_1, \Delta G_2]\mathrm{V}[\Delta G_2]^{-1}$
$= \mathrm{Cov}\left[\tilde{S}_1, \tilde{G}_2\right]\left(\mathrm{V}\left[\tilde{G}_2\right] + \mathrm{V}[\omega_2]\right)^{-1}$

equities. The result will be biased as a result of the still present classical measurement error, but will be biased toward zero and thus toward finding no effect.

Relying on this methodology, Table 6 lists our estimates of the effect of capital gains on active savings. In addition to capital gains variables, our models include variables indexing the age of household head entered as a quadratic, a set of dummy variables capturing marital transitions between the three PSID waves, net transfers into the household, and changes in average household income. The marital transitions are indexed in this table by a three-letter sequence where M indicates married and N denotes not married. To illustrate, the first transition listed - MMN- represents a household that was married in 1984, married in 1989 and then divorced or separated by 1994. Because of the significant amount of net transfers, two variables are included measuring the between wave amount of inheritances received and the amount of all net transfers into the household. In this form, the inheritance variable measures the difference between the receipt of a dollar of inheritance and a dollar of wealth from a change in family membership or from pensions.

There is evidence of a strong quadratic in age, consistent with many other studies. Entry into marriage implies increases in household wealth while an exit from marriage signals a between wave decrease. In the first difference formulation used here, second period marriage entries relative to either a first period marriage exit or marriage stability should lead to increase wealth accumulation. Similarly, second period marriage exits or marriage stability relative to a first period marriage entry should be associated with a decrease in wealth accumulation. These expectations are generally supported by the results presented in Table 6. For example, those households who got remained married between 1984 and 1989 but were then divorced or separated by 1994 (MMN) experienced about $20,000 less wealth growth between 1994 and 1989 as they did between 1989 and 1984. Similarly, those households who divorced over the first period and then remained unmarried in the second period (MNN) had almost $20,000 more wealth in the later period. Finally, the change in savings of continuously married households was less than that of continuously not married households indicating that differences in savings rates of these types of households converged.

A between wave receipt of inheritance leads to a less than dollar for dollar increase in household wealth. We estimate that for every dollar of inheritance computed levels of active saving rise by forty-six cents suggesting that the household may have consumed part

of the inheritance.[27] Other net infusions of funds from either new family members joining or pension roll-overs do not appear to appreciably increase active savings in part because these sources of net additions to household wealth are relatively small and in part since they may be improperly assigned to passive saving. For example, money withdrawn from a firm pension, which is then rolled-over into an IRA or Keogh account, would appear as capital appreciation. Since there is no real change in wealth of the household (just a reallocation of assets), household consumption and active saving should not change.

Our principal interest centers on the estimated impact of capital gains on active saving. The first model listed in Table 6, which combines all sources of capital gains into a single aggregate, indicates a quite small effect of a few cents per dollar. However, this substantially understates the impact of capital gains on saving since the source of capital gains appears to matter a great deal (see Peek (1983)). In the second column in Table 6, we present estimates which separate capital gains into those associated with housing, stock, and everything else (business and real estate). In this formulation, a dollar of capital gains in stocks reduces active saving by about seventeen cents. In contrast, the negative effect of capital gains in housing is much smaller (roughly three cents) and not statistically significant while the impact of capital gains in other tangible assets is essentially zero. [28]

This estimate of the effect of capital gains in stock on active savings still contains the negative correlated bias introduced by negatively correlated measurement error in active savings and capital gains. Following the intuition from the statistical model above, this bias is eliminated in the third column by redefining active savings to exclude active savings in stocks. Clearly, our original estimates of the capital gains effect have only been trivially reduced (from -.1711 to -.1655) by this bias. In retrospect, this is not surprising since active savings in stocks are only a small part of total active savings (and that is the only component that has this negatively correlated bias). [29] Having eliminated the impact

[27] Measurement error in inheritances would lead to estimated coefficients below unity through the standard attenuation effect.

[28] Estimates in the literature vary on the impact of capital gains in housing. Skinner (1989) finds a small negative effect of capital gains in housing on savings while Hoynes and McFadden (1994) report a small increase using the same data (PSID). Examining only non-movers, Englehardt (1995) reports a negative effect of about 14 cents. He does not take into account capital gains in stocks.

[29] One possibility that we explored was whether only a few wealthy households were determining our regression coefficients. To answer that question, we re-estimated our model deleting sequentially the wealthiest 5, 10, and 25 cases in each 1984 and 1989. Our new estimated effect of stock capital gains were -.167 (5 deletions). -.169 (10 deletions), and -.156 (25 deletions). None of these deletions had any meaningful impact on the estimated effect of capital gains in stocks on active savings.

of savings heterogeneity and persistent measurement error, only classical measurement remains which will tend to bias our estimates toward finding no effect of stock market wealth. [30]

Why would the impact of these alternative sources of capital gains be so different? While the larger effect of corporate equity is consistent with this asset being more liquid, the size of the effect for capital gains in housing may seem surprisingly small, especially in light of the rising popularity of home equity loans. Yet, this growing use of home equity financing represents more of a structural shift in the financing market than a reaction to rising or falling house values.[31] For example, home mortgages in the PSID increased as much in the 1989--1994 years as during the 1984-1989 years even though the value of homes were falling between 1989-1994 and rising between 1984-1989. Given this structural shift toward more use of home equity loans for re-financing, one would need more than the two periods available in the PSID to measure its impact. In addition, unlike corporate equity, many individuals are on both sides of the housing market simultaneously so that housing price increases may be seen as a mixed blessing. Younger households who own their own homes may still see rising housing prices as a problem if they desire to upgrade their homes in the future as their families grow.

Another explanation for a larger capital gain effect on saving may have to do with the lack of information on capital gains in pensions in the PSID data. Some of those with large capital gains in privately held stocks were probably also enjoying large gains in their firm controlled plans, which were growing in popularity over this period (Venti- Wise (1999)). The positive correlation of capital gains between private and firm accounts implies that our estimates overstate the savings adjustments to household equity accounts alone. While our ability to do much about this issue is constrained by limited PSID pension information, the forth column in Table 6 lists results from a model which adds a variable interacting capital gains in the stock market with the existence of a private pension for at least one spouse. Since those with a pension should have had larger total capital gains in stocks from all sources, our expectation is that the interaction term should be negative. The impact of capital gains in stocks is indeed statistically significant for both those with and without pensions, but is more than twice as large for those respondents with a pension.

[30] As is well known, this issue of the direction of bias due to random measurement is more complicated and depends on the existence of measurement error in other co-variates as well as the possible non-independence of measurement error from true values. See Bound, Brown, and Mathiowetz (2000) for an excellent discussion.

This difference in the size of 'wealth' effects among those with and without pensions does not suggest that these two types of households react differently to a given wealth increase. Rather it may only indicate that the true size of the wealth increase is larger among households with a pension.

Table 7 supplements the results contained in Table 6 by separating total active savings into financial and non-financial savings. The first column under financial includes all types of active savings including those in stock in the financial category while the second column excludes active savings in stock for the same measurement error reasons discussed above. Once again, the negatively correlated measurement error bias turns out to be quite small. Most important, the wealth effect from appreciation in corporate equity appears to be divided roughly equally between financial and non-financial saving.

Can our estimated effects of capital gains account for the decline in U.S. saving rates documented above? To answer this question, we used our estimates to predict NIPA saving rates allowing for year by year changes in mean household income and capital gains in stocks and housing.[32] Between 1984 and 1994, the two five year periods spanned by the PSID wealth modules were characterized by a housing market boom followed by a housing market bust producing roughly offsetting capital gains and losses in housing. In constant dollars, PSID household's achieved capital gains in stocks during both periods so that during these ten years, the equity market dominated any effect on active saving. In contrast, the years 1994 to 1998 were one of dual increases in capital gains in both housing and stocks, suggesting that the impact of capital gains on saving should have accelerated.[33]

Table 8 indicates that capital gains, especially those in corporate equity, can account for the decline in U.S. saving. Between 1984 and 1998, NIPA saving rates fell from 8.1% to 1.8%. Our model predicts a decline to 1.2%, a remarkably close match[34]. Our model

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[31] Parker (1999) also concludes that financial innovation was unlikely to have caused the recent consumption boom.
[32] Fig 1 shows that there is considerable year by year variability in NIPA saving rates. Since our model has little to say about these year by year fluctuations, we used three year moving averages for the actual and predicted rates.
[33] Housing capital gains between 1994 and 1998 were estimated as the product of the mean real housing value in the 1994 PSID and the real percent change in the U.S. housing price index between 1994 and 1998. Stock capital gains between 1994 and 1998 were computed by multiplying the mean 1994 PSID stock value by the percent increase in the Standard and Poor's index of common stocks.
[34] Parker (1999), who also used PSID data, investigated the flip side of the same issue by examining the impact of the 'wealth effect' on consumption. Parker concluded that at most the 'wealth effect' could explain only one-fifth of the recent consumption boom. He also finds that the change in consumption appears to be similar for people at different levels of wealth which he concludes is inconsistent with a strong wealth effect.
There is in fact no inconsistency at all between Parker's results and ours. In his work, Parker only estimates a single wealth effect across all assets. If we take our estimate of a single wealth effect that does not distinguish different

does less well on the exact timing of change, under predicting the fall between 1984 and 1994 and over predicting the subsequent rise between 1994 and 1998.

Is the magnitude of our estimate of the impact of capital gains in stocks reasonable? Some have argued that if the planning horizon is the expected end of life, consumption from this wealth increase should be allocated over the remaining years implying a relatively small savings effect from capital gains (Starr-McCluer (1998)). But going back to Friedman's original work (1957), there is a body of research suggesting that planning horizons are considerably shorter than that. For one thing, retirement is not the only motive for savings. For other motives such as savings for college expenses for children, horizons are considerably shorter so that impacts of capital gains on active savings may be much larger. In addition, buffer-stock savers (who implicitly behave as if they have a very short time horizon) consume a much larger fraction of a wealth shock than the text book life-cycle saver models (Carroll (1997)).[35]

Moreover, these savings responses to capital gains using the PSID should be higher than those based on macro-models for several reasons. First, stock ownership is much more widespread today than during the years covered by the early macro-studies of the 1960s and 1970s or for that matter for many years used in current generation macro-models. Second, the PSID excludes the super-wealthy whose ability to further increase their consumption may be quite limited. The consumption and savings behavior of such wealthy individuals are part of the FOF time series data. These super-wealthy individuals will lower the average negative response of savings to capital gains.

Moreover, due to the sequencing of PSID wealth modules, we are estimating effects of capital gains in corporate equity spaced five years apart. While this restriction was survey induced, it may inadvertently bring with it an analytical advantage. Given the extreme variability in stock prices, consumption smoothing households will not want to

---

types of assets (the first column in our Table 6), we also find a small wealth effect. In fact, our undifferentiated wealth effect is slightly smaller than that of Parker in that it would explain only one-sixth of the decline in savings. It is only when one differentiates different types of assets, and in particular capital gains in corporate equity, that one finds a wealth effect strong enough to explain the savings decline.

Similarly, his conclusions about the distribution of the consumption increases across wealth levels raise the same issue. His conclusions are based on a comparison across total wealth (actually its ln), but the real issue involves changes across capital gains in corporate equity. There is very little relation between cross-sectional wealth levels and capital gains in corporate equity in the PSID. For example, the simple correlation between total household wealth and total stock wealth in the 1984 PSID is only .4. More relevant to the issue at hand, the correlation between 1984 wealth (essentially the Parker variable) and subsequent capital gains in stocks (our measure) is only .12.

[35] Carroll (1997) provides simulations that yield and average MPC ranging from .16 to .49.

vary their consumption to react to daily, monthly, or even yearly equity price variation (Bhatia (1972)). Significant short-run price variability may be taken as evidence of high price variability (uncertainty) to which prudent households may well react with understandable caution in adjusting their consumption. Some changes in consumption such as durable goods may have to meet threshold requirements before changes take place. Similarly, habit consumption models also imply larger long run than short-run responses to wealth changes. If individuals wait before deciding to adjust their consumption to a shock, the period response to a capital gain shock may be small, but the five year effect we are estimating larger.[36] Finally, the sustained stock market boom of this period may have induced some individuals to revise upward their estimates of the rate of return on stocks, which, if wealth effects dominate, could increase their consumption, further.

Conclusions

This paper reached several conclusions. Most important, the rapidly declining rates of household savings since 1983 appear largely to be a consequence of the large amounts of capital gains achieved in corporate equity markets. Wealth effects are larger when they occur and persist in the stock market than they are in other assets. Moreover, a failure to differentiate wealth effects across asset types results in a significant understatement of the magnitude of their impact. The recent large increases in stock equities as a share of household wealth also imply that household wealth has become more volatile. This volatility may have implications for business cycles since persistent swings in the stock market may now have a larger impact on consumer behavior.

The changing age and family formation distributions of the American population did act to significantly reduce aggregate household wealth while rising education levels increased it. Yet, the recent trend of increasing household wealth in the face of historically low saving rates is not basically demographic in origin, but seems to be best explained by noting the tremendous capital gains over the past two decades.

Capital gains, especially in equity shares, helped to preserve wealth levels in recent years in spite of the collapse of household savings rates. However, wealth benefits from capital gains have been far from uniform. There have been two key structural changes in

[36] Consequently, micro and macro- models that include savings (or consumption) responses to these shorter-run price will estimate smaller coefficients than the longer run responses estimated here While there is considerable variation across studies, estimates from macro-models appear to be somewhat smaller than those reported here

wealth-income ratios. The already steep age-wealth gradient has become much steeper as wealth levels fell for the young and rose for the more mature. Similarly, wealth/income ratios declined for the less educated, but rose among those with more schooling. While rising rates of capital gains can offer an explanation for rising wealth levels of the more educated, it has little to say about falling wealth levels of the less educated. An explanation for falling wealth levels for those with little schooling must lie elsewhere (see Hubbard, Skinner, and Zeldes (1995)) for an explanation for low educated households).

Additional tests of the impact of capital gains on savings would be desirable. One fruitful avenue to pursue may be cross-national differences. Countries differ significantly in the extent to which households participate in the corporate equity market as well as in the magnitude of local stock market fluctuations over time. Since they also vary considerably in secular trends in national savings rates, the correspondence between country specific savings rates and stock market indexes may provide a powerful test. In addition, a better reconciliation of recent trends in household savings and consumption would help increase our confidence on the appropriate role that should be assigned to wealth effects in explaining household behavior.

(Starr-McCluer (1998)).

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Table 1
FOF Measures of Household Wealth
(thousands of 1996 dollars)

Year	Mean Net Worth Measures Per Household					Net Worth / Income	Net Worth-Pensions / Income	Net Worth-Pensions/ Income ***
	Net Worth	Net Worth - Pensions	Net Worth-Pensions *	Net Worth-Pensions**	Net Worth-Pensions ***			
1960	166.2	157.8	143.6	141.3	128.6	4.50	4.27	4.10
1961	176.0	166.6	150.8	149.5	135.3	4.68	4.43	4.24
1962	175.0	165.3	151.0	148.5	135.6	4.53	4.28	4.08
1963	179.9	169.3	154.1	151.9	138.2	4.53	4.26	4.06
1964	188.3	176.7	160.8	158.9	144.6	4.55	4.27	4.06
1965	195.6	183.0	166.6	165.6	150.7	4.54	4.25	4.03
1966	192.8	180.0	163.8	163.1	148.4	4.29	4.01	3.79
1967	206.2	192.3	175.0	174.4	158.7	4.45	4.15	3.92
1968	217.0	202.4	184.6	184.2	168.0	4.55	4.24	4.00
1969	206.4	191.9	176.2	175.4	161.0	4.23	3.93	3.72
1970	202.7	187.8	173.5	171.9	158.8	4.12	3.82	3.62
1971	210.1	194.0	179.8	178.8	165.8	4.25	3.92	3.71
1972	225.7	207.7	195.0	192.3	180.6	4.42	4.07	3.87
1973	217.2	200.1	189.7	186.1	176.5	4.10	3.78	3.61
1974	193.6	178.0	170.7	166.4	159.6	3.75	3.45	3.32
1975	200.1	182.1	175.5	171.2	165.1	3.94	3.58	3.46
1976	208.1	189.1	183.2	179.0	173.4	4.01	3.64	3.52
1977	208.9	189.5	185.0	180.4	176.0	3.94	3.58	3.48
1978	214.5	193.8	190.9	186.5	183.7	3.94	3.56	3.49
1979	223.2	201.7	199.0	194.8	192.3	4.04	3.65	3.57
1980	221.2	198.7	198.9	192.9	193.1	4.15	3.73	3.69
1981	215.2	193.0	193.9	188.5	189.4	4.01	3.59	3.56
1982	215.7	190.5	191.3	186.6	187.3	4.06	3.59	3.56
1983	221.5	192.8	192.5	188.8	188.4	4.12	3.59	3.55
1984	225.4	195.3	195.7	192.1	192.5	3.99	3.46	3.44
1985	239.3	204.5	204.8	202.1	202.3	4.17	3.57	3.55
1986	251.3	214.3	215.4	212.2	213.3	4.34	3.70	3.70
1987	254.8	217.0	216.8	215.0	214.8	4.34	3.69	3.68
1988	262.6	223.3	223.1	222.5	222.2	4.40	3.74	3.73
1989	269.6	226.3	226.3	226.3	226.3	4.49	3.77	3.77
1990	260.7	216.5	215.2	216.6	215.3	4.30	3.57	3.55
1991	266.2	218.0	215.6	219.2	216.8	4.46	3.65	3.63
1992	265.4	215.3	210.4	217.1	212.1	4.40	3.57	3.52
1993	268.9	215.4	210.8	216.8	212.3	4.42	3.54	3.51
1994	267.5	213.2	207.4	215.0	209.2	4.32	3.44	3.40
1995	283.8	223.8	216.4	226.3	218.9	4.53	3.58	3.51
1996	299.8	233.9	228.0	237.4	231.5	4.65	3.63	3.54
1997	324.3	249.6	238.2	254.6	242.9	4.92	3.79	3.70
1998	349.4	266.1	251.2	271.6	256.4	5.16	3.93	3.83

Source: Board of Govenors of the Federal Reserve, *Balance Sheets for the U.S. Economy - Flow of Funds, C.9* and the National Income and Products Accounts.

* Net worth data has been adjusted for changes in the distribution of age.

** Household data has been adjusted for changes in the distribution of marital status.

*** Both net worth and income have been adjusted for changes in the distribution of age and marital status.

Table 2.a
Household Net Worth 1962-1994

	1962		1968		1984		1989		1994	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean
All families (1)	NA	83.8	43.3	100.4	43.5	107.8	38.5	116.3	41.2	118.8
as % of FOF		50.7		49.6		55.2		51.4		55.7
All families (2)		69.4		90.8		107.8		116.3		116.9
All families (3)		NA		80.3		102.9		116.3		116.6
All families (4)		NA		88.4		110.7		116.3		113.7
Age										
25-34	4.6	28.4	17.6	41.7	12.0	34.9	11.3	29.9	12.6	48.8
35-44	27.6	66.2	48.0	99.4	59.1	108.0	49.0	116.8	41.8	104.6
45-54	43.9	91.5	58.6	132.4	93.4	204.9	86.9	215.7	92.4	188.8
55-60	56.3	135.9	74.6	139.4	105.8	173.9	133.0	219.5	119.0	244.3
61+	45.9	141.4	NA	NA	89.9	165.8	98.7	199.0	104.9	219.4
Education										
No HS deg	NA	NA	27.1	74.9	23.3	53.1	13.7	55.6	12.5	57.4
HS deg	NA	NA	46.4	85.7	39.2	79.5	35.4	84.6	32.4	75.6
HS deg	NA	NA	55.2	117.8	42.5	104.6	38.5	106.1	45.9	112.8
College deg or more	NA	NA	75.8	152.1	82.6	202.6	73.2	211.6	85.1	208.5
Marital Status										
Married	NA	NA	48.0	108.9	70.7	148.7	70.7	166.6	69.9	154.1
Not Married	NA	NA	19.6	59.3	10.2	41.7	10.7	48.4	12.5	64.8

(1) Unadjusted sample

(2) Adjusted to age distribution in 1989

(3) Adjusted to age and marital distribution in 1989

(4) Adjusted to age, marital and education distribution in 1989

Source: SFCC 1962; CDP 1968; PSID 1984, 1989, and 1994.

Table 2.b
Household Net Worth/Income Ratios

	1962		1968		1984		1989		1994	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean
All families (1)		2.30	1.15	2.32	0.98	2.02	0.85	2.10	0.90	2.02
All families (2)		1.98		2.12		2.01		2.10		2.02
All families (3)				2.10		1.98		2.10		2.04
All families (4)				2.22		2.06		2.10		2.00
Age										
25-34		0.96	0.51	1.11	0.33	0.84	0.31	0.72	0.31	0.99
35-44		1.64	1.18	2.08	1.16	1.82	0.96	1.95	0.86	1.75
45-54			1.51	2.87	1.75	3.23	1.61	3.08	1.70	2.84
55-60		4.00	2.21	3.44	2.22	2.94	2.92	3.74	2.79	3.59
61+		6.67			4.11	5.31	4.41	5.84	4.37	5.77
Education										
No HS deg			0.90	2.32	0.84	1.53	0.48	1.64	0.46	1.72
HS deg			1.26	2.10	0.97	1.75	0.87	1.84	0.78	1.62
Some College			1.26	2.40	0.88	1.94	0.83	1.99	0.99	1.96
College deg or more			1.53	2.37	1.30	2.51	1.11	2.51	1.22	2.38
Marital Status										
Married			1.18	2.34	1.26	2.26	1.22	2.37	1.17	2.07
Not Married			0.85	2.10	0.39	1.30	0.38	1.42	0.44	1.93

(1) Unadjusted full sample
(2) Adjusted to age distribution in 1989
(3) Adjusted to age and marital distribution in 1989
(4) Adjusted to age, marital and education distribution in 1989
Source: SFCC 1962; CDP 1968; PSID 1984, 1989, and 1994.

Table 3.a
Household Wealth by Birth Cohort
(Thousands of 1996 Dollars)

	1968		1984		1989		1994	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Birth Year of Head (Age in parentheses)								
1921-1930	(38-47)		(54-63)		(59-68)		(64-73)	
Full Sample	51.5	110.4	106.6	171.1	118.1	231.7	121.1	262.6
High School or less	37.7	77.4	81.1	122.4	84.4	146.2	89.9	145.8
Some College or more	81.9	159.5	192.4	296.5	224.6	436.9	310.1	543.7
1931-1940	(28-37)		(44-53)		(49-58)		(54-63)	
Full Sample	28.7	53.6	88.6	146.3	101.9	197.3	119.0	231.3
High School or less	17.3	43.0	62.3	91.4	70.1	128.3	74.6	152.1
Some College or more	38.7	64.1	132.8	239.1	156.4	296.4	203.6	337.4
1941-1950			(34-43)		(39-48)		(44-53)	
Full Sample			55.6	101.4	64.5	175.3	88.7	183.9
High School or less			40.2	73.5	42.6	90.7	51.2	98.2
Some College or more			74.6	128.5	96.8	241.6	120.1	246.1
1951-1960			(24-33)		(29-38)		(34-43)	
Full Sample			10.2	31.6	21.7	59.1	39.2	97.7
High School or less			6.3	23.9	12.4	38.2	23.0	56.3
Some College or more			14.7	41.9	30.4	80.1	65.1	138.8
1961-1970					(19-28)		(24-33)	
Full Sample					4.4	15.8	11.2	46.4
High School or less					2.5	12.5	7.3	29.0
Some College or more					8.4	20.5	14.8	64.0

Source: Consumer Debt Panel (1968) ; Panel Study of Income Dynamics (1984,1989,1994).

Table 3.b
Household Wealth/Income Ratio by Birth Cohort
(Thousands of 1996 Dollars)

	1968		1984		1989		1994	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Birth Year of Head (Age in parentheses)								
1921-1930	(38-47)		(54-63)		(59-68)		(64-73)	
Full Sample	1.25	2.28	2.49	3.18	3.58	5.01	4.55	6.20
High School or less	1.04	2.04	2.29	2.95	3.11	4.20	4.08	4.77
Some College or more	1.64	2.49	3.16	3.50	4.58	5.95	7.21	7.65
1931-1940	(28-37)		(44-53)		(49-58)		(54-63)	
Full Sample	0.77	1.29	1.62	2.33	2.03	2.93	2.92	3.81
High School or less	0.57	1.33	1.42	1.86	1.79	2.65	2.40	4.23
Some College or more	0.86	1.27	1.94	2.80	2.26	3.13	3.18	3.60
1941-1950			(34-43)		(39-48)		(44-53)	
Full Sample			1.12	1.74	1.15	2.66	1.63	2.71
High School or less			1.02	1.69	0.95	1.88	1.28	2.12
Some College or more			1.20	1.78	1.46	3.03	1.73	2.96
1951-1960			(24-33)		(29-38)		(34-43)	
Full Sample			0.29	0.80	0.52	1.21	0.82	1.66
High School or less			0.22	0.74	0.36	1.04	0.60	1.30
Some College or more			0.35	0.85	0.59	1.33	1.09	1.86
1961-1970					(19-28)		(24-33)	
Full Sample					0.17	0.51	0.29	1.00
High School or less					0.12	0.48	0.23	0.76
Some College or more					0.26	0.54	0.32	1.18

Source: Consumer Debt Panel (1968) ; Panel Study of Income Dynamics (1984,1989,1994).

Table 4
Mean Family Saving from 1984-1994
(thousands of 1996 dollars)

	Active Saving	Passive Saving	Total Wealth Change	Net Transfers
All families	42.2	8.7	50.8	8.6
Age of head (in 1984)				
Less than 25	35.8	3.8	39.5	1.2
25-34	55.5	3.7	59.2	6.0
35-44	54.4	14.5	68.9	8.7
45-54	58.4	12.4	70.7	20.1
55-64	27.0	13.6	40.6	7.2
65 or more	-0.3	1.3	1.0	6.2
Education of head (in 1984)				
Less than high school degree	13.9	2.2	16.2	1.9
High school degree	30.0	3.8	33.8	12.1
Some college	51.2	5.8	57.0	7.7
College degree or more	90.5	27.2	117.7	11.5

Source: PSID

Table 5
A. The Relation Between Active Saving and Stack Capital Gains
(thousands of 1996 dollars)

	1984-1989		1989-1994	
	Active	Stock Gains	Active Savings	Stock Gains
Total	24.1	2.0	18.1	8.8
Age				
less 25	17.7	0.0	14.1	-0.1
25-34	26.6	0.8	25.8	3.3
35-44	26.7	3.0	28.0	8.5
45-54	38.9	6.5	27.7	14.4
55-64	21.5	0.4	8.7	16.5
65 or more	4.1	0.9	-1.3	4.2
Education				
less HS	8.8	-1.1	6.5	3.3
HS	17.4	1.4	9.0	5.8
Some college	24.7	3.4	25.2	9.6
College or more	53.9	5.9	39.2	19.3

Table 6
Effects of Capital Gains on Active Saving
(Fixed Effect Estimates)

	All Active Saving				All Active Saving—Active Savings in Stock			
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Age	2,399	3.66	2,379	3.64	2,251	3.50	2,204	3.39
Age2	-23.8	-3.82	-23.4	-3.76	-22.4	-3.67	-21.7	-3.51
Marriage Transitions								
MMN	-20,506	-4.40	-20,259	-4.36	-21,413	-4.67	-21,088	-4.52
MNM	7,024	0.90	7,170	0.92	7,173	0.93	6,937	0.90
NMM	-6,811	-1.27	-6,406	-1.20	-8,919	-0.93	-9,066	-1.72
NNM	14,618	2.00	15,074	2.07	12,542	1.75	13,738	1.88
NMN	-18,353	-2.23	-18,874	-2.30	-17,682	-2.19	-18,047	-2.20
MNN	18,884	3.45	19,433	3.55	17,930	3.34	18,033	3.33
MMM	-5,225	-2.63	-4,766	-2.40	-5,803	-2.97	-5,895	-2.99
Net Transfers	0.0255	2.25	0.0253	2.23	0.0272	2.44	0.0272	2.43
Inheritances	0.4443	6.49	0.4606	6.72	0.4252	6.31	0.4310	6.36
Average Total Income	0.0815	1.77	0.0883	1.91	0.0715	1.58	0.0717	1.56
Capital Gains								
All Capital Gains	-0.0265	-1.74						
Cap Gains-Housing			-0.0281	-1.09	-0.0197	-0.77	-.0182	-.0.71
Cap Gains-Stocks			-0.1711	-4.27	-0.1655	-4.20	-.1050	-2.24
Cap Gains-Other			0.0194	0.85	0.0197	0.88	.0193	0.86
Pension* Cap Gains Stock							-.2041	-2.40

Table 7
Effects of Capital Gains on Active Financial and Non-Financial Saving
(Fixed Effect Estimates)

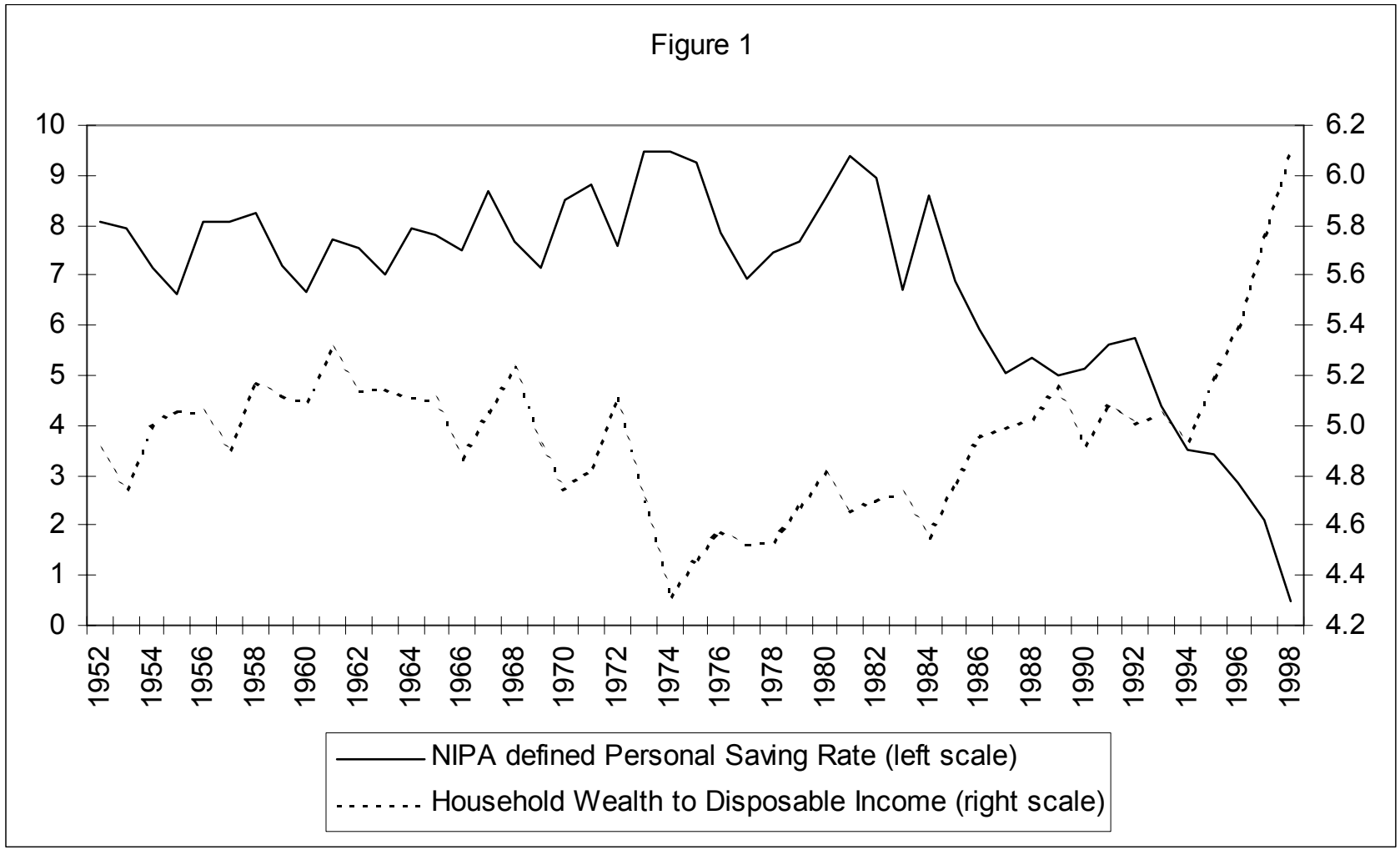
	Financial Saving		Financial Saving—Stock Active Saving		Non-Financial Saving	
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Age	1,262	2.50	1,134	2.32	1,117	2.71
Age2	-15.3	-3.19	-14.4	-2.05	-8.07	-2.05
Marriage Transitions						
MMN	-4,734	-1.32	-5,783	-1.67	-15,525	-5.30
MNM	1,696	0.28	1,699	0.29	5,474	1.11
NMM	-863	-0.21	-3,376	-0.84	-5,543	-1.64
NNM	7,080	1.26	4,547	0.84	7,994	1.74
NMN	-10,174	-1.60	-8,983	-1.47	-8,700	-1.68
MNN	8,114	1.92	6,610	1.62	11,319	3.28
MMM	-1,503	-0.98	-2,540	-1.72	-3,263	-2.60
Net Transfers	-0.0085	-0.97	-0.0065	-0.77	0.0337	4.72
Inheritances	0.3017	5.70	0.2663	5.20	0.1589	3.67
Average Total Income	0.1264	3.55	0.1096	3.18	-.0381	-1.31
Cap Gains-Housing	0.0083	0.41	0.0167	0.84	-00364	-2.23
Cap Gains-Stocks	-0.0855	-2.77	-0.0799	-2,67	-0.0856	-3.39
Cap Gains-Other	0.0319	1.81	0.0321	1.89	-0.0124	-0.87

Table 8
Model Predictions for Saving Rates

NIPA Saving Actual	Predicted	
1984	8.1	8.1
1989	5.1	6.2
1994	4.5	4.9
1998	1.8	1.2

.

Figure 1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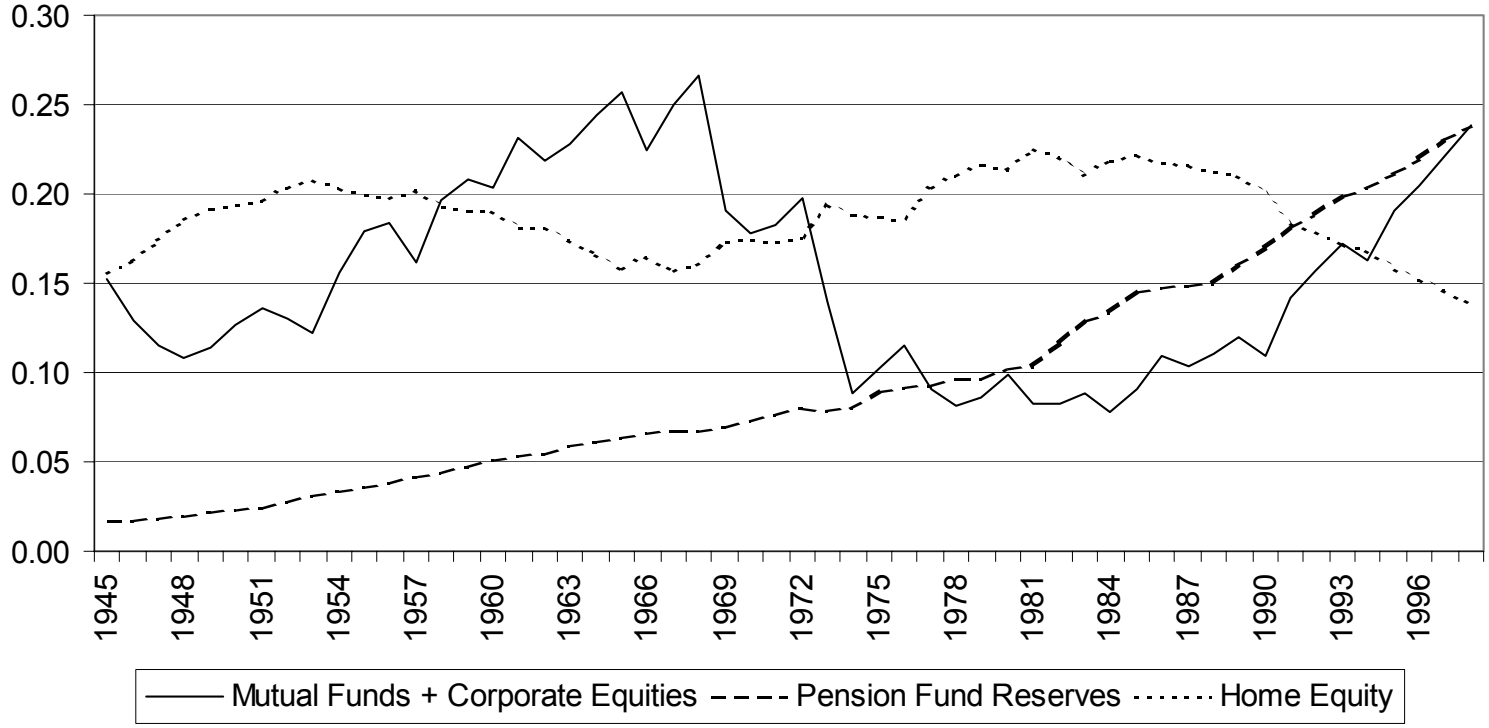
NIPA defined Personal Saving Rate (left scale)
Household Wealth to Disposable Income (right scale)

Figure 2:
Household Wealth Components as a Share of Total Net Worth



Source: Flow of Funds.

Figure 3.a:
Real Relative Stock Prices 1947 to 1998, Standard & Poor's Index of Common Stocks
(1947 base)

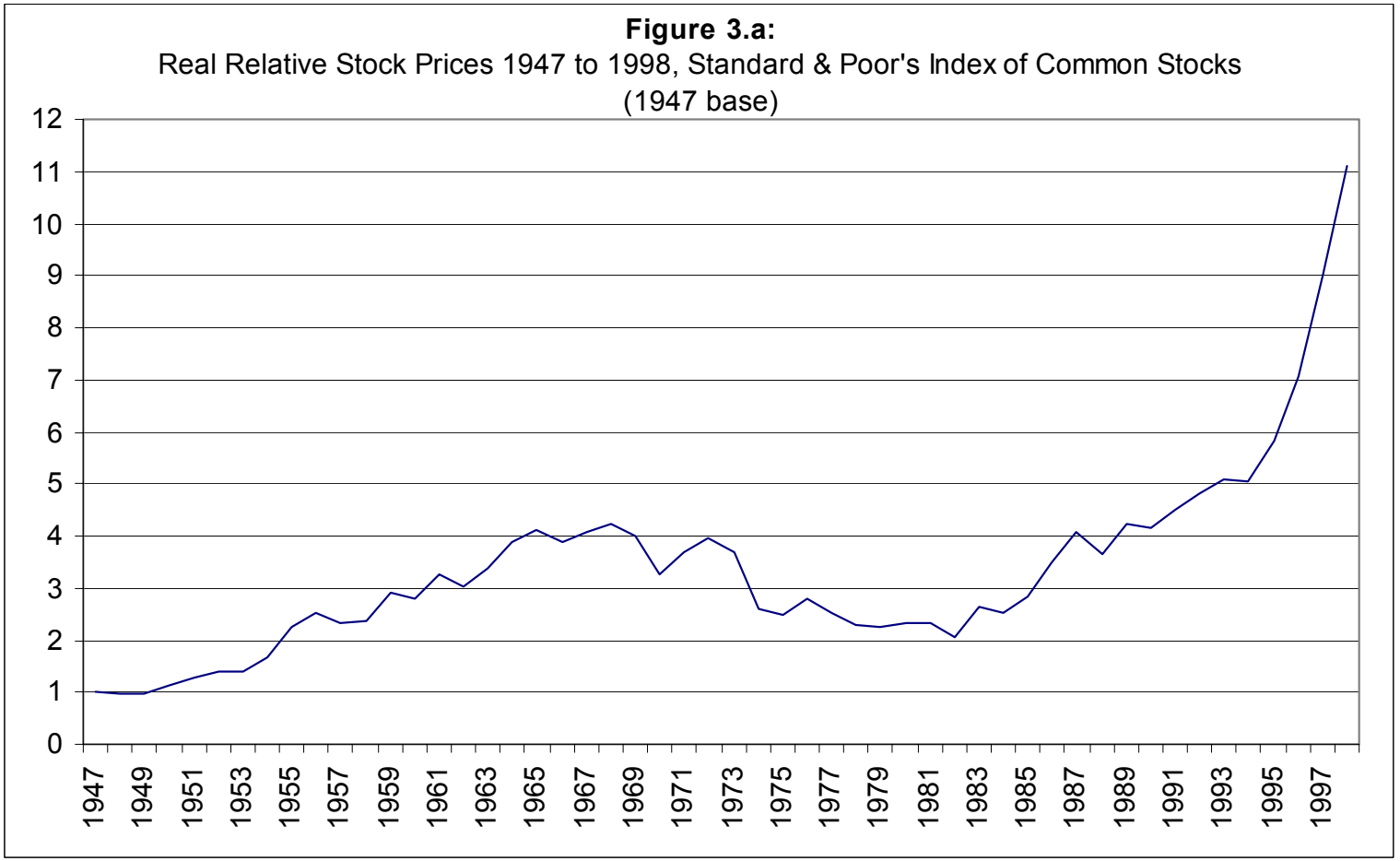
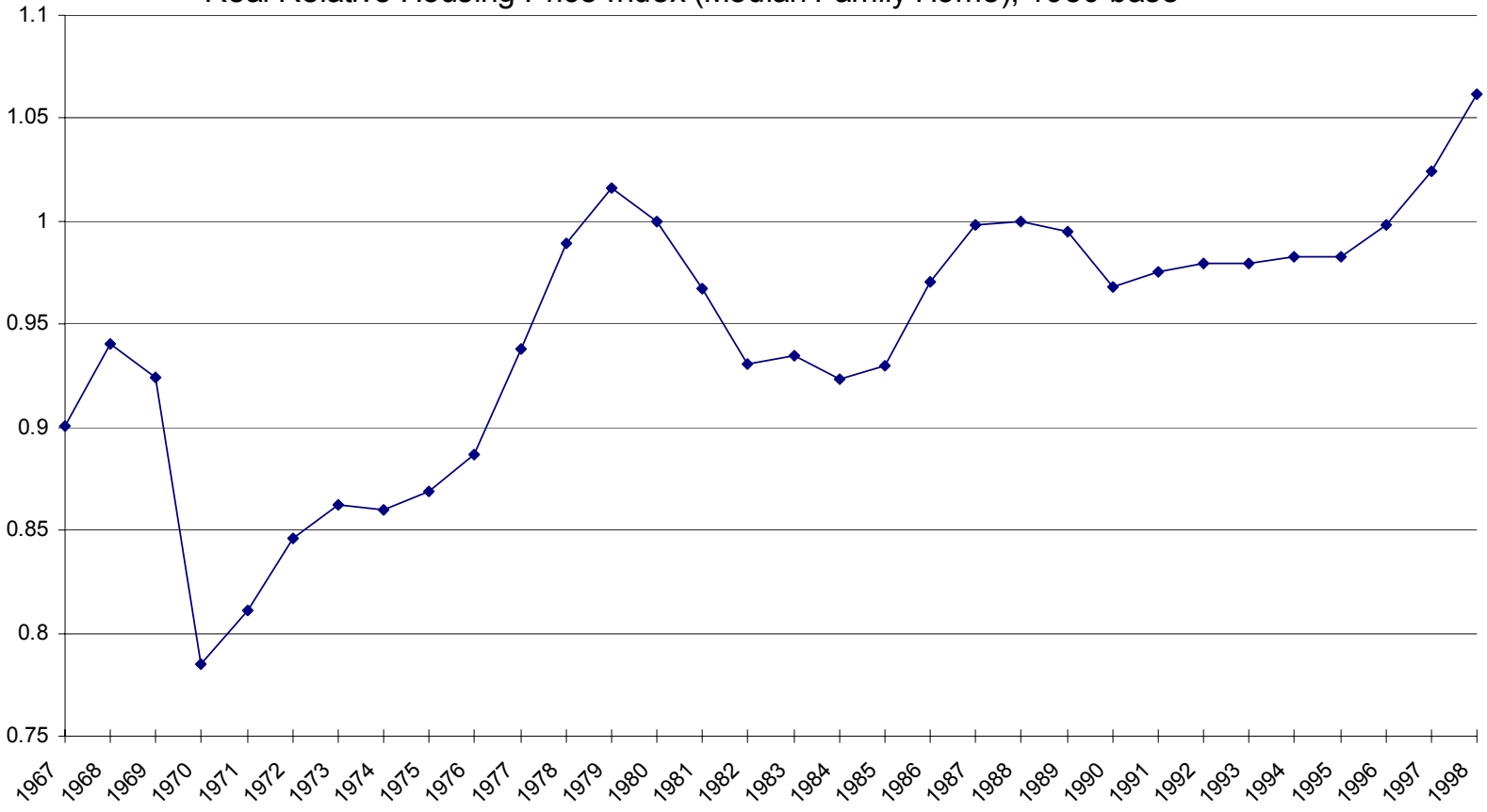


Figure 3.b:
Real Relative Housing Price Index (Median Family Home), 1980 base



Appendix Table A
Family Net Worth: Full PSID Sample

	1984			1989			1994		
	Median	Mean	Percent	Median	Mean	Percent	Median	Mean	Percent
All families (1)	47.0	138.5	100.0	47.2	159.8	100.0	50.6	157.0	100.0
As % of FOF		70.9			70.6			73.6	
All families (2)		143.9			159.8			159.7	
All families (3)		141.0			159.8			155.5	
All families (4)		144.6			159.8			150.6	
Age of head									
Less then 25	2.9	17.6	8.7	2.4	11.0	6.5	4.9	25.9	6.3
25-34	12.9	40.4	25.7	12.4	43.5	24.1	13.8	60.6	23.4
35-44	63.0	161.6	18.7	52.1	137.8	22.7	45.9	124.3	25.2
45-54	103.6	246.6	13.1	91.0	311.4	12.9	99.7	227.9	17.7
55-64	111.1	204.3	14.4	138.3	284.7	13.4	146.2	278.3	10.3
65 or more	87.1	178.4	19.4	93.7	190.6	20.5	104.4	238.3	17.1
70 or more	77.8	164.4	14.2	93.1	191.6	14.6	90.8	182.1	11.6
Education of head									
Less than high school degree	26.6	76.9	28.7	22.7	92.3	26.8	20.9	85.3	21.4
High school degree	43.8	105.7	35.1	43.6	112.7	32.0	41.8	106.0	32.3
Some college	51.8	133.4	16.2	49.0	167.5	20.1	56.9	151.4	20.7
College degree or more	101.9	295.3	19.5	98.0	309.9	21.0	105.4	293.0	24.5
Marital status of head									
Married	84.8	201.7	55.1	94.3	243.5	52.6	86.7	216.6	56.4
Not married	12.8	61.1	44.9	14.8	66.9	47.4	16.4	79.9	43.5

(1) Unadjusted full sample.

(2) Adjusted to age distribution in 1989.

(3) Adjusted to age and marital distribution in 1989.

(4) Adjusted to age, marital and education distribution in 1989.

Appendix Table B
Net Worth/Income Ratio: Full PSID Sample

	1984			1989			1994		
	Median	Mean	Percent	Median	Mean	Percent	Median	Mean	Percent
All families (1)	1.30	3.03	100.0	1.28	3.34	100.0	1.30	3.00	100.0
As % of FOF		88.10			88.60			88.20	
All families (2)		3.12			3.34			3.17	
All families (3)		3.13			3.34			3.15	
All families (4)		3.14			3.34			3.09	
Age of head									
Less then 25	0.13	0.70	8.7	0.12	0.48	6.5	0.22	1.02	6.3
25-34	0.35	0.98	25.7	0.34	1.05	24.1	0.34	1.23	23.4
35-44	1.24	2.72	18.7	1.02	2.31	22.7	0.95	2.08	25.2
45-54	1.94	3.89	13.1	1.69	4.44	12.9	1.84	3.43	17.7
55-64	2.69	3.94	14.4	3.29	4.89	13.4	3.85	4.70	10.3
65 or more	4.54	6.18	19.4	4.82	6.94	20.5	4.95	6.72	17.1
70 or more	4.55	6.18	14.2	5.75	7.34	14.6	5.47	6.28	11.6
Education of head									
Less than high school degree	1.32	2.77	28.7	1.14	3.38	26.8	1.01	3.12	21.4
High school degree	1.24	2.59	35.1	1.29	2.80	32.0	1.18	2.51	32.3
Some college	1.19	2.69	16.2	1.16	3.26	20.1	1.31	2.77	20.7
College degree or more	1.70	3.85	19.5	1.56	3.82	21.0	1.59	3.45	24.5
Marital status of head									
Married	1.69	3.37	55.1	1.81	3.78	52.6	1.60	3.14	56.4
Not married	0.61	2.24	44.9	0.68	2.34	47.4	0.71	2.69	43.5

(1) Unadjusted full sample.

(2) Adjusted to age distribution in 1989.

(3) Adjusted to age and marital distribution in 1989.

(4) Adjusted to age, marital and education distribution in 1989.