

# The Relative Importance of Housing Wealth in the Retirement Saving Decision

by

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In this paper we examine saving behavior using a longitudinal model of households for a period of time that includes the two important macroeconomic wealth cycles that have occurred in the United States since 1990. We decompose the household asset portfolio to isolate both stock market and real estate wealth effects. This decomposition also enables us to examine more closely retirement savings behavior and address specifically the question of the relative importance of housing wealth in the retirement saving decision. We find that, contrary to some earlier evidence, housing wealth dominates stock market wealth in explaining active saving behavior among households and that, consistent with the conventional wisdom, home equity is a significant factor in the retirement saving decision.

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## **The Relative Importance of Housing Wealth in the Retirement Saving Decision**

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During the past eighteen years, households in the United States have experienced two of the most significant cycles in household wealth since the Great Depression. The first, dating from 1990 to a peak at the beginning of 2001 and subsequent trough in the second half of 2002, was characterized by a 367% run-up in the value of liquid stock market assets. A second cycle followed, peaking at an even higher level of real per capita household net worth in 2007. However, the evidence to date on the origins and impact of the current wealth cycle is mixed with much of the conventional wisdom attributing the driving force to the collapse of a bubble in housing prices. Nationally, U.S. housing prices increased by as much as fifty percent during this second cycle, and have fallen by as much as eighteen percent during the past two years.<sup>2</sup> A closer examination of a decomposition of household net worth reveals that the current cycle can be characterized by both stock market and real estate wealth effects resulting from an unprecedented collapse of financial markets. As a result, the macroeconomic implications and appropriate response by both policy makers and households may be quite different than those for the previous wealth cycle.

A recent paper by Donihue and Avramenko (2007) examines the macroeconomic evidence for real estate wealth effects for the wealth cycle of 1990 to 2002 using a conventional life-cycle approach for modeling aggregate demand. Contrary to some of the earlier work on wealth effects, these authors find that changes in real estate wealth in fact dominate changes in stock market wealth in terms of aggregate consumer spending. Furthermore, these effects turn out to be asymmetric over the wealth cycle. Table 1 updates the macro evidence on the decomposition of household net worth presented in Donihue and Avramenko to include the second wealth cycle experience of the last five years. In Table 1 it is evident that, unlike the first wealth cycle, the

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<sup>2</sup> The Case-Shiller Home Price Index for the nation peaked in 2006q2, after increasing by fifty percent from the trough of the first wealth cycle in 2002q3. From 2002q3 to 2007q3 the increase was 43 percent.

experience since 2002 can be characterized by a larger appreciation in the value of real estate assets and a greater increase in illiquid stock market assets (which include primarily retirement pension funds) than liquid stock market wealth. Unlike the experience of the first wealth cycle, the reduction in household wealth following the 2007q3 peak is accompanied by a significant reduction in the growth of per capita disposable income and personal consumption expenditures, foreshadowing a possible economic recession.

Recent macroeconomic events have prompted a number of studies seeking to identify the impact of real estate wealth on household behavior using a variety of approaches. Ludwig and Sløk (2004) used a panel data set for sixteen OECD countries for the period 1960 to 2000 to estimate consumption elasticities for both stock and housing prices. Due to data limitations, they use stock and housing price indices as proxies for the stock market and housing components of household wealth. Then, allowing for a structural break due to financial market innovations, they divide their sample in 1984 into two time periods and find significant stock price elasticities in both periods and a significantly larger housing price elasticity in the latter time period. However, in their models they were unable to find a significant difference between the responsiveness of consumption to stock prices versus home values.

Case, Quigley and Shiller (2005) examined a panel data set for fourteen developed countries over the period 1975 to 1996 and compared their wealth effect estimates with those for a panel of U.S. states for the period 1982 to 1999. They find little evidence to support a significant stock market wealth effect but strong evidence of a housing wealth effect on consumption, both in the U.S. and internationally.

In a departure from some of the more conventional modeling approaches, Slacalek (2006) employs a dynamic habit formation model for a panel data set across sixteen countries. He uses an alternative measure of real estate wealth in an attempt to resolve some of the underlying uncertainties in the literature concerning wealth effects on household consumption. Slacalek finds that in both the U.S. and U.K., housing wealth effects dominate financial market wealth effects over the period of 1965 to 2003.

Much of the recent work on household wealth effects has been motivated by the secular decline in personal saving rates that has occurred in the U.S. during the past twenty-five years. In an attempt to isolate the microeconomic evidence underlying this trend, several recent studies employ data from the Panel Study of Income Dynamics (PSID) to estimate household wealth

effects longitudinally. Skinner (1989) assesses the impact of home values on consumption using the PSID for the period 1976 to 1981. Skinner was unable to confirm his hypothesis that rising home values would correspond to increases in household spending. In a later study, Skinner (1996) employed data from the 1984 and 1989 waves of the PSID to demonstrate that the decline in saving observed in the U.S. during the 1980s could in fact be due to a rapid appreciation in home prices. Engelhardt (1996) reports the same result, also using the PSID.

Hoynes and McFadden (1997) estimate the effect of equity in the home on saving using the 1984 and 1989 waves of the PSID, stressing demographic features of the participant households. Like Skinner's earlier work, these authors find that changes in home equity have small or insignificant effects on non-real estate saving.

Juster, Lupton, Smith and Stafford (2006) provide a useful framework for decomposing the financial portfolio of PSID households when considering wealth effects. The rationale that they present for their approach allows for: (i) the possibility of differing marginal propensities to consume out of capital gains in housing versus stock market capital gains due to transactions costs that accompany home equity financing; (ii) perceived liquidity constraints on the part of households; and (iii) the multi-dimensional nature of the role some assets play in a household's consumption/saving decision, particularly in the case of housing. The authors carefully define active saving behavior on the part of PSID households and estimate the effects of capital gains across various asset types, including home equity and stock market assets. Their results come from three survey waves of the PSID – 1984, 1999, and 1994 – that mark the very beginning of the stock-market induced wealth cycle of 1990 – 2002. Juster, et al., find that changes in the value of corporate equities have a larger impact on active saving than any of the other asset components in the household's wealth portfolio. They find no evidence of a significant effect from capital gains in housing wealth, or for any of the other non-stock market assets held by households over this period. From this result they conclude that "...most of the decline in the personal saving rate over the 1990s can be explained by the unprecedented rise in the value of corporate equities."<sup>3</sup>

In this paper we set out to model saving behavior using a longitudinal model of households in the United States for a period of time that includes the two wealth cycles that have occurred since 1990. We decompose the household asset portfolio to isolate both stock market and real

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<sup>3</sup> Juster, et al. (2006), p. 20.

estate wealth effects. This decomposition also enables us to examine more closely household behavior in accumulating a retirement savings portfolio and address specifically the question of the relative importance of housing wealth in the retirement saving decision. We find that, contrary to some of the evidence for earlier time periods, housing wealth dominates stock market wealth in explaining active saving behavior among households and that, true to conventional wisdom, the value of the home is a significant factor in the retirement saving decision.

The analysis that follows differs from previous work on household wealth effects in three important ways. First, using the basic framework of the analysis by Juster, et al., we examine the saving behavior of households using the micro-level survey data of the PSID for a period of time that includes both macroeconomic wealth cycles. Thus, our estimates capture wealth effects during both the run-up and collapse in stock prices leading to the 2000 peak in household net worth, as well as wealth effects associated with the bursting of the housing price bubble in 2007. Second, we update the definition of active saving employed by Juster, et al., to include investment in retirement accounts and include in our decomposition of wealth effects capital gains in this asset. We then extend our analysis to evaluate the role of home equity in the retirement saving decision for the PSID households.

In many ways the Panel Study of Income Dynamics is well suited to an examination of household wealth effects. Originating in 1968 with 4,800 families, the final wave of the survey used in our sample for 2005 includes almost 7,400 households. Detailed questions on the survey regarding asset accumulation and saving behavior enabled us to decompose financial portfolios across seven types of wealth. Survey questions specifically targeting retirement savings behavior were added to the 1999 wave, making it possible for us to estimate wealth effects for the PSID households that include these assets for the 1999, 2001, 2003 and 2005 waves of the survey.

Our definition of active saving builds on that employed by Juster, et al., using their same seven wealth categories plus the net change in the value of retirement assets between surveys, which was not available for the period of their analysis of the PSID data. Active saving represents intentional investments in the asset components of a household's financial portfolio, whether the purchase of stocks, paying down the principal on a home mortgage, or adding to a 401K-type retirement or IRA account. In this context, capital gains in any of these assets represent 'passive' saving behavior and are employed here as explanatory factors in modeling

active saving behavior in conjunction with other demographic and income controls. We decompose the household financial portfolio into eight asset categories including: housing wealth; other real estate wealth; the value of a farm or private business; durable goods wealth in the form of motor vehicles and boats; liquid financial wealth, including checking, saving and money market accounts; stock market assets; retirement accounts, and all other wealth, including life insurance, bonds, and collections.<sup>4</sup> All of our calculations are inflation-adjusted using the 2000 chain-weighted price index for personal consumption expenditures. We also adjust our sample by trimming ten outlying observations from either end of the distribution of observations for each component of active saving and apply 2005 sample weights in all of our calculations.<sup>5</sup>

Table 2 presents a decomposition of active saving for 2,600 PSID households that had the same household head across the four survey waves corresponding to the two macroeconomic wealth cycles defined in Table 1. The results in Table 2 for the PSID households generally conform to the macroeconomic evidence in Table 1. Total active saving decreased by 16%, from a mean of \$8,466 to \$7,112, with the collapse of the stock market bubble that occurred between 2001 and 2003. This decline was fueled in large part by an 81% drop in the value of stock market assets (from \$844 on average to just \$166) while the value of housing wealth decreased only slightly and other real estate wealth increased more than three-fold. The experience of non-homeowners was much worse than for homeowners in terms of total active saving, which turned negative for this group of households in both the 2001 to 2003 and 2003 to 2005 periods. By 2005, mid-way in the run-up in the second macroeconomic wealth cycle in the U.S., our sample of PSID households realized continued declines in active saving in stock market assets, but their active saving in retirement accounts soared. Overall, total active saving increased by 27%, to \$9,002, during the 2003 to 2005 period with the gains confined primarily among homeowners who saw a 46% increase in active saving in their homes.

Table 3 presents a demographic break-down for four of the components of active saving by age cohort, education level of the household head, and the type of retirement saving portfolio. In terms of active saving in housing wealth, perhaps the most interesting behavior is revealed for households in the 45 to 54 age cohort, as active saving falls dramatically over this period; turning

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<sup>4</sup> The definitions we used to calculate active saving are provided in the appendix.

<sup>5</sup> Juster, et al., trimmed the top and bottom 1% of their sample. We experimented with a number of trimming techniques and samples and found that trimming ten observations was most appropriate.

negative during 2003-2005. Although not reported on the PSID survey, this might suggest a ‘trading up’ of buying into larger, more expensive houses, or perhaps incurring home equity lines of credit for tuition or other spending often attributed to households in this age cohort, particularly during this time period. Also notable in Table 3 is the significantly larger levels of active saving across all asset types for college-educated households relative to households where the head does not hold a college degree. In terms of the retirement portfolio, a conventional pattern of life-cycle asset accumulation is revealed where households build up retirement saving as the household head ages and then dis-saving during retirement in all three inter-survey periods.

Table 4 presents a demographic break-down of active and passive saving capital gains for the PSID households in our sample.<sup>6</sup> Three categories of capital gains are included in Table 4. The negative capital gains in stock market wealth associated with the downturn in the first wealth cycle are perhaps the most evident feature in Table 4, as witnessed by almost every age and educational cohort for the 2001-2003 inter-survey period. Capital gains in housing wealth are much larger during the 2003-2005 period across all age and educational cohorts than for either of the preceding periods. Similarly, gains in the value of retirement asset portfolios are more pronounced for 2003-2005 period, with the largest gains experienced by those households in which the head is between 55 and 64 years old. College-educated households again witnessed the greatest capital gains in housing, stock market, and retirement wealth during this period.

In Table 5 we present four models of active saving for 2,539 households that had the same head across all four survey waves over our sample period of 1999 to 2005. Like Juster, et al., we use fixed-effect regressions but add controls for possible time trends in active saving using survey binary variables for observations corresponding to the 2001 and 2003 waves. These variables turn out to be important explanatory factors in each of our models. In model (1) we estimate total active saving as a function of the age of the household head, three marital transition states, net transfers into the household, inheritances, average total income, and capital gains for five wealth components. *Ceteris paribus*, as the head of household ages active saving tends to fall. This is true for each of our models of active saving. If the household head gets

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<sup>6</sup> Capital gains are not applicable for the following wealth components: motor vehicles, liquid assets (which includes checking and saving accounts), and the other assets category (which includes life insurance policy and bond holdings).

married during the inter-survey period, this appears to have no effect on total active saving. However, should the household head become divorced or widowed, active saving tends to decline. Transfers in to the household, net of transfers out, appear to be statistically insignificant, although inheritances tend to increase active saving with roughly twenty-three cents out of every dollar of inheritance winding up in savings. Active saving, as expected, is a positive function of average total income according to our estimates.

For model (1) we were able to confirm the results of Juster, et al., and many other studies that stock market capital gains tend to reduce active saving on the part of PSID households. However, contrary to these studies we find that housing capital gains play an even larger role in reducing active saving than the effect of passive saving through stock market wealth. The difference between the coefficients on housing capital gains and stock market capital gains in model (1) is statistically significant, but only at the 10% level. Somewhat surprisingly, we found that capital gains in household retirement portfolios tend, on average, to increase active saving.

To explore the effect of passive retirement saving on active saving further, we first looked at possible differences in the effect of capital gains versus capital losses, i.e., asymmetric behavior on the part of the PSID households. Several interesting results emerged, as illustrated by model (2) in Table 5. For both housing wealth and stock market wealth, positive capital gains have a statistically significant negative effect, increasing active saving by fourteen cents and seventeen cents respectively for every dollar increase in capital gains,<sup>7</sup> while negative gains for either asset do not significantly affect active saving behavior. In the case of retirement saving, however, additional capital losses tend to reduce active saving while additional gains have no significant effect.

We also suspected that demographics may play a role in identifying the effect of passive retirement saving on active saving we witnessed in model (1), so in models (3) and (4) we separate our sample into two age cohorts: the first for household heads who are less than or equal to 45 years old throughout our sample period, and the so-called “baby boomer” generations, i.e., those households who either find themselves older than 45 in 1999 or move into the over 45 cohort during our sample period. We find that, for both cohorts, capital gains in housing wealth play a significant negative role in the active saving decision; however, the effect is larger for younger households. Stock market capital gains are significantly negative for the older cohort,

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<sup>7</sup> The difference in positive gains between housing wealth and stock market wealth is not statistically significant.



reducing active saving, but do not serve as a significant substitute for active saving among younger households. And, adding insight to our result from model (1), we find that passive gains in retirement wealth is significantly negative for younger households but positive, and statistically significant, in explaining active saving in the older age cohort. Older households, according to our results, tend to increase active saving as they realize increased capital gains in their retirement portfolios, while younger households see these capital gains increases as a substitute for active saving.

In summary, we find that households substitute passive saving for active saving in response to capital gains in housing and stock market wealth, with the housing wealth effects on par with stock market wealth effects, except among older households. Asymmetries appear to be important in active saving behavior for our sample of households during the wealth cycles of 1999-2005. And younger households tend to respond more strongly to passive gains in housing wealth than do older households and do not respond to capital gains in stock market wealth in their active saving decisions.

We turn next to our question of the role of the home in the retirement saving decision. Despite the increasingly important role of home equity in many households' retirement portfolios, few studies have dealt explicitly with the impacts of this portfolio allocation on retirement saving. Venti and Wise (1996) provide a representative example of this literature in their examination of the impact the introduction of personal retirement accounts, such as 401K, IRA, and Keogh accounts, had on the reallocation of resources due to this new form of saving. The conventional wisdom is that if individuals save more through personal retirement accounts they will subsequently reduce saving of other forms. Venti and Wise find that the introduction of personal retirement accounts actually added to the financial wealth of U.S. households using a panel data set for the period of 1984-1991. Although the authors do not provide a detailed look at home equity in their analysis, they do suggest that households with a head older than 58 tend to reduce personal retirement accounts as a result of a windfall in home equity, while younger households do not reduce these assets.

We begin our analysis of this question with the results in Table 6, where we present fixed-effect regressions using the active saving in retirement accounts component of total active saving as our dependent variable. In model (5) we use the same age and marital transition variables as in our earlier models, as well as the controls for net transfers, inheritances, average total income,

and time trends across the survey period. In this context, we find that active retirement saving increases with age. Marriage and divorce appear to not impact retirement saving significantly. Widowhood only matters in the retirement saving decision among younger households according to our analysis [illustrated in models (6) and (7)]. In Model (5) we employed the same modeling framework used for active saving by including capital gains for the same five wealth components. We found no statistically significant effect for passive gains in housing wealth and only a modest effect for stock market capital gains. Dividing the sample into younger and older age cohorts provides little additional insight, although an interesting positive effect for passive gains in the retirement accounts component appears for younger households, giving some indication that age cohorts may play an important role in the retirement saving decision. A check for asymmetries by age cohort, captured in models (7) and (8) in Table 6, reveal no role for housing wealth and only adds to the uncertainty surrounding the effect of capital gains in retirement wealth accounts on active retirement saving among younger households.

We found the answer to our question of home equity on active retirement saving in the alternative approach presented in Table 7. For the models in this table, we replaced the capital gains explanatory variables with corresponding levels of real wealth for the seven non-retirement wealth components for the PSID households in our sample. In model (9) we find no significant effect from the level of housing wealth, i.e., home equity, on retirement saving. However, as illustrated in model (10), if we decompose the home equity wealth effects by age cohort using interactive dummy variables, significant wealth effects emerge. More importantly, these effects follow a pattern that is consistent with life-cycle wealth effects as the relative importance of the home increases as the household head ages.<sup>8</sup> Models (11) and (12) examine level effects for our young and old age cohorts, but again housing wealth is not statistically significant when modeled in this fashion.

In summary, we find that the home does indeed play a significant role in the retirement saving decision. However, what matters are changes in the level of home equity and not changes in passive capital gains. Increases in home equity tend to reduce retirement saving and, while the magnitudes of the differences are small, the effects are greatest for households with a head who is 65 or older and smallest for households with a head between 25 and 34 years of age.

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<sup>8</sup> We were able to reject the null hypothesis that the interaction terms are jointly insignificant, as well as the null hypothesis that all of the housing wealth coefficients in model (10) were insignificant, at the 5% level.

Somewhat surprisingly, increases in stock market wealth appear to have no significant effect on the retirement saving decision according to our results.

Contrary to some previous studies of saving that coincide with earlier time periods, we find that wealth effects from home equity are just as important as stock market wealth effects. We also find significant differences in the behavior of age cohorts. The large gains and subsequent losses in housing wealth during this wealth cycle will have a significant affect primarily on the saving behavior of younger households according to our results, with passive gains in home equity not significantly changing saving behavior for older households.

As the demographics of the U.S. population change due to the continuing retirement of the baby boomer generation, the question of how changes in the financial portfolio of households impact retirement saving behavior becomes of critical concern for policy makers. For older households, increases in the level of home equity have a large, significant effect on the reduction of retirement saving, indicating the importance of the home in financing retirement for many older households. This too has implications for policy makers as they look toward reforming the market for mortgage-backed securities.

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**Table 1: Real Per Capita Household Net Worth Over Two Macroeconomic Wealth Cycles**

	Cycle 1		Cycle 2		Cycle 1		Cycle 2	
	1990q3	2000q1	2002q3	2007q3	1990q3 – 2000q1	2000q1 – 2002q3	2002q3 – 2007q3	2007q3 – 2008q2
Household net worth	97,559	155,252	126,660	164,471	59.1%	-18.4%	29.9%	-8.0%
Stock market wealth	14,394	60,728	29,604	47,043	322%	-51.3%	58.9%	-18.4%
Non-stock market wealth	83,164	94,523	97,056	117,429	13.7%	2.7%	21.0%	-3.9%
Liquid stock market assets	9,455	44,196	18,529	27,496	367%	-58.1%	48.4%	-20.5%
Liquid non-stock market assets	16,305	14,856	16,791	19,847	-8.9%	13.0%	18.2%	0.6%
Illiquid stock market assets	4,939	16,532	11,076	19,547	235%	-33.0%	76.5%	-15.5%
Illiquid non-stock market wealth: Real estate assets	32,450	38,132	44,228	56,501	17.5%	16.0%	27.8%	-7.1%
Illiquid non-stock market wealth: Durables and equipment	34,409	41,536	36,037	41,080	20.7%	-13.2%	14.0%	-1.6%
Per capita consumption	19,125	23,680	24,684	27,371	23.8%	4.2%	10.9%	0.1%
Per capita disposable income	21,324	25,274	26,182	28,669	18.5%	3.6%	9.5%	0.2%
Real GDP per capita	28,455	34,467	34,967	38,438	21.1%	1.5%	9.9%	0.2%

Chained 2000 dollars. Source: Federal Reserve Board of Governors Flow of Funds data and the Bureau of Economic Analysis. Definitions for the components of household net worth can be found in Donihue and Avramenko (2007).

**Table 2: Active Saving**

	1999 to 2001	2001 to 2003	2003 to 2005
Active Saving	8,466	7,112	9,002
Homeowners	12,054	11,146	13,058
Non-homeowners	1,004	-2,159	-860
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Housing wealth	2,542	2,410	3,517
Other real estate wealth	441	1,532	1,582
Value of private business	589	657	600
Motor vehicle assets	1,343	243	757
Liquid non-stock market wealth	2,104	2,350	1,781
Stock market wealth	884	166	48
Other assets (bonds, life insurance)	205	-60	1,214
Retirement wealth	718	236	687
Accumulated Debt	360	422	1,184

Mean values for 2,600 PSID households with the same household head and valid observations for active saving in all four survey waves. Adjusted using 2005 sample weights and by trimming 10 outlying observations from either end of the range of values for each component. Chained 2000 dollar values.

**Table 3: Decomposing Active Saving**

	Number of Households			Housing Wealth			Liquid Non-Stock Market Wealth			Stock Market Wealth			Retirement Wealth		
	1999-2001	2001-2003	2003-2005	1999-2001	2001-2003	2003-2005	1999-2001	2001-2003	2003-2005	1999-2001	2001-2003	2003-2005	1999-2001	2001-2003	2003-2005
All households	3502	3469	3353	2530	2039	2807	2038	1721	1349	715	175	136	681	351	638
Age of household head															
Under 25	121	51	7	0	-36	10616	400	37	3513	36	-6	0	28	-51	0
25 to 34	705	617	483	1482	2879	7231	314	1609	811	384	58	107	711	186	377
35 to 44	1015	913	814	3983	2362	5020	1743	1431	498	766	40	15	810	654	471
45 to 54	890	953	988	3281	837	-342	1645	2728	1823	1050	275	161	1249	964	1040
55 to 64	355	471	550	2446	3565	4389	5651	2361	1905	1049	93	292	1330	900	1359
65 or older	416	464	511	-35	1433	-625	3913	-91	1670	345	492	138	-1257	-1801	-392
Education of household head															
No high school degree	696	656	634	61	-68	-476	625	566	-275	76	10	88	119	-92	-172
HS Degree or some college	1832	1881	1785	2302	708	1065	1042	1492	777	454	116	78	226	-13	151
College degree or more	974	932	934	4724	6208	8362	4922	2996	3545	1663	410	277	1941	1397	2119
Retirement saving portfolio															
Mostly in stocks	394	388	383	6649	6388	10471	5381	2694	1387	3087	489	65	3062	2175	2494
Mostly interest bearing	209	241	220	2828	-456	3550	1853	3821	4488	1245	146	218	1152	934	1681
Diversified portfolio	384	358	397	7591	6374	4591	4339	4875	5707	1364	761	471	3146	1330	3086

Mean values for households with the same head for all 4 survey waves and valid observations across all active saving components for at least one of the three observation periods. Adjusted using 2005 sample weights and by trimming 10 outlying observations from either end of the range of values for each component of active saving. Chained 2000 dollar values. Age and education levels of the household head are defined as of the beginning of the period.

**Table 4: Active and Passive Saving**

	Number of Households			Active Saving			Capital Gains: Housing Wealth			Capital Gains: Stock Market Wealth			Capital Gains: Retirement Wealth		
	1999-2001	2001-2003	2003-2005	1999-2001	2001-2003	2003-2005	1999-2001	2001-2003	2003-2005	1999-2001	2001-2003	2003-2005	1999-2001	2001-2003	2003-2005
All households	2283	2243	2233	7656	6679	5987	9546	9224	17296	3098	-2589	2193	2024	-643	4585
Age of household head															
Under 25	84	34	5	302	-895	17327	765	3190	0	-50	-104	0	49	51	0
25 to 34	477	440	360	4333	5683	5297	6078	3911	8188	692	163	-401	959	-142	1332
35 to 44	675	613	582	9720	9477	7275	8391	9529	15778	2549	-2688	1513	2707	590	3076
45 to 54	593	617	661	9335	6857	4043	13417	11553	17878	3890	-3871	3109	1777	1641	3346
55 to 64	226	280	326	11788	9136	9656	11473	9055	25146	10178	-643	445	5062	-5944	10341
65 or older	228	259	298	2745	-339	4416	11484	12951	21703	1837	-6404	6582	589	-4209	8002
Education of household head															
No high school degree	442	391	436	4980	37	-569	3110	2803	7296	1139	86	-78	914	-279	1583
HS degree or some college	1198	1224	1208	5179	5424	2258	8086	7938	14910	1364	-1876	2138	1583	639	3114
College degree or more	643	628	589	14110	13261	18488	16691	15727	29590	7673	-5644	3987	3608	-3367	9823

Mean values for households with the same head for all 4 survey waves and valid observations across all capital gains components for at least one of the three observation periods. Adjusted using 2005 sample weights and by trimming 10 outlying observations from either end of the range of values for each component of active saving. Chained 2000 dollar values. Age and education levels of the household head are defined as of the beginning of the period.



**Table 5: Four Models of Active Saving**

Variable	(1) Full Sample	(2) Asymmetries	(3) Head < 46	(4) Head > 45
Age	-7727**	-7669**	-2369	-16418**
Marital transition				
Married	-2402	-2608	-5125	19360
Divorced	-34261***	-32907***	-39705***	-14380
Widowed	-71468***	-69427***	112336**	-77606***
Net transfers	0.074	0.066	0.314**	-0.017
Inheritances	0.230***	0.231***	0.228***	0.239***
Average total income	0.108***	0.101***	0.146***	0.036
Capital gains				
Housing wealth	-0.147***		-0.284***	-0.078**
Positive		-0.139***		
Negative		-0.137		
Other real estate wealth	-0.0188		-0.099***	-0.002
Positive		0.104***		
Negative		-0.194***		
Value of private business	0.03		0.065**	0.024
Positive		0.004		
Negative		0.073		
Stock market wealth	-0.099***		0.022	-0.132***
Positive		-0.169***		
Negative		-0.024		
Retirement wealth	0.039***		-0.065**	0.045**
Positive		-0.013		
Negative		0.084***		
2001 survey binary variable	-30672**	-29663**	-11288	-64589**
2003 survey binary variable	-17224**	-16532**	-8340	-33934**
Constant	407006**	404264**	97867	1025790**
Observations	6759	6759	3483	3276
Number of households	2539	2539	1417	1382
R-squared	0.041	0.051	0.073	0.049

Fixed-effect regressions for households with the same head in 1999, 2001, 2003 and 2005. Adjusted using 2005 sample weights and by trimming 10 outlying observations from either end of the range of values for each component of active saving. Chained 2000 dollar values. Age of the household head is defined as of the beginning of the period.

\*\*\*p-value < 0.01, \*\*p-value < 0.05, \*p-value < 0.1

**Table 6: Retirement Saving and Capital Gains**

Variable	(5) Full Sample	(6) Head < 46	(7) Head < 46	(8) Head > 45
Age	994.2**	249.3	171.1	1865**
Marital transition				
Married	68.3	28.72	26.64	1582
Divorced	-619	-95.91	39.46	-1192
Widowed	-564	-11444***	-11396***	157.6
Net transfers	-0.014**	-0.023***	-0.023***	-0.004
Inheritances	-0.011***	-0.004	-0.004	-0.017**
Average total income	-0.003*	0.005	0.006*	-0.004
Capital gains				
Housing wealth	-0.001	-0.002		
Positive			-0.001	-0.003
Negative			-0.009	0.022
Other real estate wealth	0.001	-0.003		
Positive			-0.009**	-0.003
Negative			0.005	0.005
Value of private business	0.002	0.002		
Positive			-0.001	0.004
Negative			0.012**	-0.001
Stock market wealth	0.004**	0.003		
Positive			0.013***	0.001
Negative			-0.008*	0.007*
Retirement wealth	0.001	0.010***		
Positive			0.030***	-0.002
Negative			-0.014***	0.004
2001 survey binary variable	3802**	1056	755.8	7139**
2003 survey binary variable	1483*	486.3	308	2884*
Constant	-51870**	-9206	-6446	-115961**
Observations	10365	5114	5114	5251
Number of households	4233	2223	2223	2375
R-squared	0.006	0.024	0.042	0.01

Fixed-effect regressions for households with the same head in 1999, 2001, 2003 and 2005. Adjusted using 2005 sample weights and by trimming 10 outlying observations from either end of the range of values for each component of active saving. Chained 2000 dollar values. Age of the household head is defined as of the beginning of the period.

\*\*\*p-value < 0.01, \*\*p-value < 0.05, \*p-value < 0.1

**Table 7: Retirement Saving Wealth Effects**

Variable	(9) Full Sample	(10) Age Cohorts	(11) Head < 46	(12) Head > 45
Age	974.6**	950.0**	135.3	1681**
Marital transition				
Married	62.12	40.22	160.3	1184
Divorced	-214.7	-213.3	208.4	-1046
Widowed	-2432	-2428	-14538***	-1522
Net transfers	-0.013*	-0.014**	-0.026***	0.001
Inheritances	-0.017***	-0.017***	-0.005	-0.025***
Average total income	-0.002	-0.002	0.007*	-0.002
Real wealth components				
Housing wealth	-0.002	-0.031**	-0.002	-0.003
Under 25 years		0.0013		
25 to 34		0.0011**		
35 to 44		0.0008**		
45 to 54		0.0007**		
55 to 64		0.0005**		
65 and over		0.0003*		
Other real estate wealth	0.002	0.002	-0.002	0.002
Value of private business	0.002	0.002	0.002	0.002
Motor vehicle assets	0.020**	0.020**	0.014	0.030*
Liquid non-stock market wealth	0.025***	0.025***	0.007	0.026***
Stock market wealth	0.002	0.002	0.003	0.003
Other assets (bonds, life insurance)	0.019***	0.019***	0.008**	0.025***
2001 survey binary variable	3905**	3819**	632.5	6665**
2003 survey binary variable	1376	1335	226.1	2389
Constant	-51611**	-50328**	-5062	-105385**
Observations	10288	10288	5016	5272
Number of households	4328	4328	2283	2432
R-squared	0.019	0.021	0.025	0.025

Fixed-effect regressions for households with the same head in 1999, 2001, 2003 and 2005. Adjusted using 2005 sample weights and by trimming 10 outlying observations from either end of the range of values for each component of active saving. Chained 2000 dollar values. Age of the household head is defined as of the beginning of the period.

\*\*\*p-value < 0.01, \*\*p-value < 0.05, \*p-value < 0.1

## Appendix – Active saving components

- Housing wealth equals the current home value minus any mortgage principal. For households that moved between surveys active saving is the change in their home equity. For households that went from renting to homeownership between surveys, active saving is their existing home equity. For households living in the same home in each survey, active saving is the change in the mortgage principal plus home improvement investments. Housing wealth capital gains equal the change in housing wealth between surveys minus active saving.
- Other real estate wealth is reported directly on the PSID survey. Active saving for other real estate is equal to the purchase of new assets minus sales during the between survey period. Capital gains equal the change in the value of the other real estate wealth minus active saving.
- Farm/Private business wealth is reported directly on the PSID survey. Active saving is any purchases minus sales during the between survey period. Capital gains equal the change in the value of this asset minus active saving.
- Wealth in automobiles, trucks, motor homes, or boats is reported directly on the PSID survey. Active saving is the net change in the reported value of these assets between surveys. There are no reported capital gains for this component.
- Liquid assets include checking/savings accounts, money market funds, CDs, government bonds and T-bills. The total value of these assets is reported directly on the PSID survey. Active saving is the net change in the reported value of these assets between surveys. There are no reported capital gains for this component.
- The current value of stock market assets is reported directly on the PSID survey. Active saving is equal to purchases minus sales that occurred during the period between surveys. Capital gains are equal to the net change in value between surveys minus active saving.
- Other saving includes bonds, life insurance policies and collections. Active saving is the net change in the reported value of these assets between surveys. There are no reported capital gains for this component.
- The value of the retirement portfolio is reported directly on the PSID survey. Active saving represents additions to the portfolio minus any withdrawals. Capital gains are equal to the change in the reported value between surveys minus active saving.

Total active saving is equal to the sum of these components minus the amount of debt accumulated between surveys.