

Baby Boomer retirement security: The roles of planning, financial literacy, and housing wealth [☆]

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Abstract

We compare wealth holdings across two cohorts of the Health and Retirement Study: the early Baby Boomers in 2004, and individuals in the same age group in 1992. Levels and patterns of total net worth have changed relatively little over time, though Boomers rely more on housing equity than their predecessors. Most important, planners in both cohorts arrive close to retirement with much higher wealth levels and display higher financial literacy than non-planners. Instrumental variables estimates show that planning behavior can explain the differences in savings and why some people arrive close to retirement with very little or no wealth.

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1. Introduction

The standard economic model of wealth accumulation posits that consumption decisions are made in a life-cycle framework, where consumption-smoothing requires one to save during the working years to support consumption after retirement.¹ Specifically, this framework models the consumer as maximizing his discounted lifetime expected utility such that consumption flows and wealth stocks at each point depend on his permanent income, i.e., anticipated lifetime resources, as well as preference parameters. To do so, the consumer must understand present discounted values, the difference between nominal and real amounts, and be able to project expected future labor income, pensions and social security benefits, retirement ages, and survival probabilities, among many other factors. These requirements are inherently complex and demanding.

Our goal in this paper is to evaluate how successfully individuals plan for retirement, whether financial literacy is associated with better planning, and whether retirement preparedness is associated with these behaviors. Specifically, in what follows, we provide new evidence regarding people's economic knowledge and planning, and how these are associated with saving behavior. The analysis uses two cohorts of data from the [Health and Retirement Study \(HRS\)](#) in 2004 and 1992 to evaluate wealth on the verge of retirement. Three questions are of central interest:

1. What do the level and composition of wealth tell us about the financial position of the Baby Boomers compared to prior cohorts?
2. Are more sophisticated and financially literate individuals more likely to plan for retirement?
3. Does planning affect wealth accumulation?

To address these issues, we first assess the level and distribution of wealth holdings of Baby Boomers on the verge of retirement, along with those of a comparable age group in 1992. Looking at both cohorts, we find that the median Boomer has more wealth than its precursor cohort a dozen years before, but those in the lowest quartile are less well off. We also show that housing equity is a key component of retirement assets, though the concentration of wealth in one asset leaves many Boomers vulnerable to fluctuations in the housing market. Holders of stocks, IRAs, and business equity are concentrated in the top quartiles of the wealth distribution. We next assess alternative explanations for differences in household wealth, focusing on respondents' planning efforts and the financial literacy they bring to solving the retirement problem. We show that financial literacy influences planning behavior and that planning, in turn, increases wealth holdings, even after controlling for many sociodemographic factors. Inasmuch as planning is an important predictor of saving and investment success, we believe we have identified an important explanation for why wealth holdings differ so much across households, and why some people enter retirement with very low amounts of wealth.

2. An overview of pre-retirement wealth

Our analysis draws on the Health and Retirement Study (HRS), a rich and detailed nationally representative survey of Americans over the age of 50 (and their spouses of any age).

¹See Browning and Lusardi (1996) for a review.

This survey was designed to track assets, liabilities, health, and patterns of wellbeing in older households both over time and across cohorts.² Beginning in 1992, the survey has been administered every 2 years.³ In this paper, we compare and contrast the experiences of what we call the “Early Baby Boomer” (EBB) cohort, where at least one household member was born between 1948 and 1953, with an earlier cohort first interviewed in 1992 (the 1992 HRS cohort). Both cohorts are selected to be in the 51–56 age range at the time of the interview. The older sample totaled 4,580 and the EBB sample totaled 2,635 after we deleted a handful of households with missing observations or zero income. All statistics reported use HRS household weights and all values are expressed in 2004 dollars.

Wealth for these respondents on the verge of retirement is measured in terms of their self-reported household total net worth; separately we also report home equity and non-housing/non-business wealth. **Total net worth** is a broad concept; it includes respondents’ checking and savings account balances, certificates of deposits and T-bills, bonds, stocks, IRAs and Keoghs, home equity, second homes and other real estate, business equity, vehicles, and other assets, minus all debt. **Home equity** refers to respondents’ net equity in their homes after subtracting mortgage debt. **Non-business-non housing wealth** is obtained by subtracting home and business equity from total net worth.⁴

The distribution of total net worth for both cohorts appears in [Table 1](#). The wealth distribution is very skewed: Boomers’ median net worth is \$152,000, while the mean is two and a half times greater (approximately \$390,000). The fact that wealth is distributed quite unevenly is also seen in the fact that Boomers in the third quartile have more than 10 times the wealth (\$400,000) of households in the first quartile (\$36,000). We also note that Boomers hold more wealth than the earlier cohort, but the improvement has not been uniform: in fact, Boomers in the lowest quartile of the wealth distribution have less wealth than their precursor counterparts.⁵

One reason Boomers have more net worth is because they have more housing equity; overall, the median amount of housing equity is \$68,000 for the EBB group, with a mean value twice this amount. At the mean, one-third of the early Boomers’ wealth is held in the form of home equity, and at the median the fraction is close to half. That is, many Americans currently on the verge of retirement have accumulated little wealth outside their homes. Note that housing equity still represents a crucial component of net worth (close to one-third) for even the wealthiest respondents.⁶ In the third column of [Table 1](#), when both housing and business wealth are excluded from the net worth computation, a sizeable fraction of the Boomers turn out to have either zero or negative net wealth (for instance, due to credit card and other loans). Indeed, if we focus only on net worth without housing and business equity, the median Early Boomer holds less wealth than the prior cohort.

²<http://hrsonline.isr.umich.edu/>

³A 90-min core questionnaire is administered to age-eligible respondents and their spouses; in addition, the “financially knowledgeable” respondent is asked to report information on household finances.

⁴Two other important components of total retirement wealth not included here are Social Security and pension wealth. For a detailed analysis of the importance of pension and Social Security wealth, see [Gustman and Steinmeier \(1999\)](#). In future data releases, these components may be calculated from administrative records linked to respondent records, but they are not currently available.

⁵This confirms earlier findings ([Mitchell and Moore, 1998](#); [Moore and Mitchell, 2000](#)).

⁶Given that home values are self-reported, one may wonder about the accuracy of these reports. [Bucks and Pence \(2006\)](#) compare household self-reported housing data with lender-reported data. They find that most homeowners appear to report their house value and rate of house price appreciation accurately.

Table 1
Distribution of total net worth and wealth components (\$2004)

Percentile	Total net worth (\$)	Housing equity (\$)	Non-housing non-business wealth (\$)
(A) Early Baby Boomers: age 51–56 in 2004 (N = 2,635)			
5 th	–3,500	0	–8,850
10 th	100	0	–300
25 th	36,000	7,000	7,000
50 th	152,000	68,000	47,500
75 th	400,000	160,000	190,200
90 th	891,000	300,000	534,000
95 th	1,327,000	430,000	886,000
Mean	387,690	127,280	220,700
Std dev.	960,350	296,200	674,500
(B) 1992 HRS cohort: age 51–56 in 1992 (N = 4,580)			
5 th	0	0	–1,890
10 th	1,350	0	0
25 th	40,660	6,730	8,750
50 th	136,260	60,590	49,140
75 th	315,060	121,180	162,240
90 th	700,130	215,420	420,080
95 th	1,218,500	290,820	768,800
Mean	327,650	88,560	184,230
Std dev.	737,950	146,400	496,310

Note: All data weighted using HRS household weights.

A final observation from Table 1 is that the wealthiest households in both cohorts are disproportionately business owners; when we omit business equity from net worth, the right tail of the wealth distribution displays much less extreme values.⁷

The heterogeneity in wealth observed for both cohorts remains large even within socio-economic groups. For instance, Table 2 (Panel A) depicts total net worth by educational attainment and highlights the very steep wealth-education gradient; the median Boomer respondent with less than a high school education has less than \$22,000 in total net worth, whereas respondents with a high school degree have almost four times as much, and respondents with a college degree have 14 times as much. It is also important to highlight the dispersion in wealth within given education groups. For example, considering only those with a high school degree, respondents in the third quartile hold more than 15 times as much wealth as those in the first quartile. The wealth gradient is flattest (but still sizable) for the most educated; the third/first quartile wealth ratio is 5 times among those with a college degree.

Other pronounced wealth differences are also evident in Table 2 where we break down the results by race and ethnicity, marital status, and sex. One striking result within the EBB is that the median White household reports close to \$200,000 in total net worth, whereas the Black household's net worth value is one-eighth as large (\$25,000), and the net worth of Hispanic households is one third as large (\$56,000). The third/first quartile wealth gradient at 7.3 for Whites is much flatter than for Blacks and Hispanics. Another large difference stands out among different marital status groupings. For instance, the median

⁷See also Gentry and Hubbard (2004) and Hurst and Lusardi (2007).

Table 2
Total net worth by demographic group (\$2004)

Group	25th Percentile	Median	Mean	75th Percentile	N
(A) Early Baby Boomers: age 51–56 in 2004 (N = 2,635)					
Education					
< HS	3	21,400	100,380	78,000	327
HS graduate	15,374	88,500	215,637	243,000	745
Some college	34,000	133,000	278,665	319,085	757
College graduate	140,000	302,000	664,197	691,000	448
> College	168,000	365,000	786,232	845,000	358
Race					
White	62,800	199,000	457,850	463,000	1,741
Black	0	25,000	120,351	115,000	454
Hispanic	5,000	55,800	176,718	200,000	186
Other	9,000	70,000	236,852	250,000	254
Marital status					
Married	85,000	223,000	499,557	498,000	1,622
Non-married	2,750	52,500	201,313	199,000	1,013
Children					
None	26,000	122,300	366,596	370,000	316
Some	37,000	157,000	390,836	404,000	2,319
Sex					
Male	55,000	194,000	485,898	481,000	1,346
Female	20,000	104,000	271,358	297,500	1,289
Income					
1st Quartile	25	20,000	103,119	89,500	749
2nd Quartile	31,000	95,000	190,163	223,200	683
3rd Quartile	95,000	194,000	317,214	379,010	610
4th Quartile	240,000	462,700	939,941	991,000	593
(B) 1992 HRS cohort: age 51–56 in 1992 (N = 4,580)					
Education					
< HS	1,346	41,065	147,057	118,483	1,007
HS graduate	39,719	121,176	242,715	256,489	1,740
Some college	67,051	166,954	363,286	352,084	926
College graduate	117,137	257,163	516,428	556,467	479
> College	149,451	291,361	687,753	706,860	428
Race					
White	60,588	166,550	377,153	368,241	3,221
Black	337	36,487	109,963	115,117	814
Hispanic	2,693	46,047	108,162	126,562	414
Other	1,077	151,470	250,052	297,555	131
Marital status					
Married	72,706	173,686	385,171	376,319	3,310
Non-married	2,558	51,836	183,899	172,339	1,270
Children					
None	32,987	130,601	369,600	309,672	378
Some	41,604	136,781	323,603	315,058	4,202

Table 2 (continued)

Group	25th Percentile	Median	Mean	75th Percentile	N
Sex					
Male	58,568	166,954	398,210	368,914	2,500
Female	20,869	102,326	238,805	249,263	2,080
Income					
1st Quartile	942	27,534	111,810	101,047	1,266
2nd Quartile	41,065	102,024	198,969	219,463	1,174
3rd Quartile	89,266	170,320	295,801	316,404	1,112
4th Quartile	165,473	329,195	703,614	667,142	1,028

Note: All data weighted using HRS household weights.

married respondent has over four times the total net worth of the median non-married respondent (where the latter group includes separated, divorced, widowed, and never married individuals). Lack of resources is also a stark concern for the non-marrieds, with the bottom quartile having only \$3,000 in total net worth. Respondents with children (most of the EBB sample) have accumulated more wealth than the childless, and male respondents report much higher net worth than female respondents.

Comparing Boomers with their predecessors, we see that some demographic groups are doing worse in terms of their wealth holdings when compared to the earlier cohorts (Table 2, Panel B). For example, EBBs without a college degree display lower wealth than the 1992 cohort. Wealth holdings are lower throughout the wealth distribution. Blacks in 2004 have accumulated less wealth compared to 1992, and so have those households in the lower quartiles of the income distribution.

Next, we turn to the composition of wealth. Table 3 shows again that one of the most important assets held by both cohorts is the home. Not only are most EBB and members of the 1992 cohorts homeowners, but home equity accounts for a third of total net worth among the EBBs. When we sum together home equity and other real estate (an asset most prominent among wealthier households), the amount of wealth accounted for by total real estate is 47% for EBB, while it was 43.8% for the earlier cohort. Thus, exposure to the housing market has risen for the EBB group, as compared to the 1992 HRS cohort.

Two other important assets in the portfolios of both cohorts are stocks and IRAs or Keoghs. However, most households do not hold large amounts of wealth in this form; the share of wealth accounted for by stocks is 12% among Boomers, up from 8% among the 1992 HRS cohort. The share of IRAs and Keoghs is similar but slightly lower (10.6% for the EBBs and 7.5% for the HRS cohort). If all IRAs were invested in equities, more than 22% of EBBs' wealth would be invested in stocks, while only about 16% of the earlier cohort's wealth was invested in the stock market. Thus, in addition to holding more housing, Boomers are also more exposed to the stock market than the HRS cohort.

2.1. Vulnerability to wealth shocks

As just noted, housing wealth emerges as a key component of saving for many Americans on the verge of retirement. Not only is the rate of homeownership very high for Boomers, but their homes are also one of the few assets held broadly, across educational

Table 3
Asset ownership and percentage of wealth accounted for by each asset (%)

Group	Home	Real estate	Stock	IRA	Own business
% with asset ownership					
1992	78.6	24.8	30.6	40.6	19.0
2004	79.9	17.1	30.9	41.5	14.7
t-stat of diff	1.34	-7.95	0.32	0.79	-4.77
(p-value)	(0.18)	(0.00)	(0.75)	(0.43)	(0.00)
% of net worth accounted for by that asset					
1992	27.0	16.8	8.3	7.5	16.7
2004	32.8	14.2	12.1	10.6	10.2

Note: All data are weighted using HRS household weights. N in 1992 = 4,577; in 2004 = 2,635.

levels and across all ethnic/racial minority groups. In view of the upward trend in housing prices over the last decades, some have suggested that housing is good way to finance retirement, particularly for Boomers who have benefited from widespread appreciation of home equity.⁸ Yet macroeconomic and monetary policymakers should be concerned with this reliance on housing values to finance retirement, since a sharp interest rate rise could induce a “hard landing” in housing values, and many Boomer households could then experience substantial wealth losses.

To help evaluate the importance of this possibility, we have modeled what would happen to Baby Boomers if housing prices in each region were to return to their 2002 levels. Inasmuch as home prices rose substantially over the 2002–2003 period, this exercise would imply an average national housing price drop of 13.5% ([Office of Federal Housing Enterprise Oversight, 2005](#)). Our simulation computes how much wealth would change for the EBBs if real estate prices (of home, second home and other real estate) declined by as much as they rose in the respondent’s own Census region over the period. Our results suggest that a shock of this magnitude would be substantial for Boomers; 10% of their total net worth would be lost. Furthermore, for the median household, net worth would fall by 13.7%. This finding clearly reinforces the fact that Boomers are quite vulnerable to housing market shocks.

A related issue to consider when assessing EBB wealth is whether this generation anticipates using home equity to finance their retirement. Prior waves of retirees have not downsized their homes at retirement nor have they taken up reverse mortgages ([Venti and Wise 1990, 1991](#)). There is, however, some evidence that home equity is a buffer used in the event of widowhood and to finance long-term care. And not surprisingly, whether one includes or excludes housing equity has a substantive effect on measures of Baby Boomers’ financial wellbeing ([Bernheim, 1993; CBO, 1993](#)).

In view of the rise in home equity values for Boomers, the role of housing in financing retirement has the potential to be even more important than in the past. Of course, we do not know yet whether and how this cohort will draw down home equity in retirement, though it may be of interest to ask households what they expect to do. To this end, we

⁸For instance, [Edmunds and Keene \(2005\)](#) urge readers to “use your home to finance your retirement ... Forgot to save for retirement, but bought a house? Saved a lot and also bought a house? Whatever your situation, (we) can show you how to best use your home equity for a long and prosperous retirement.”

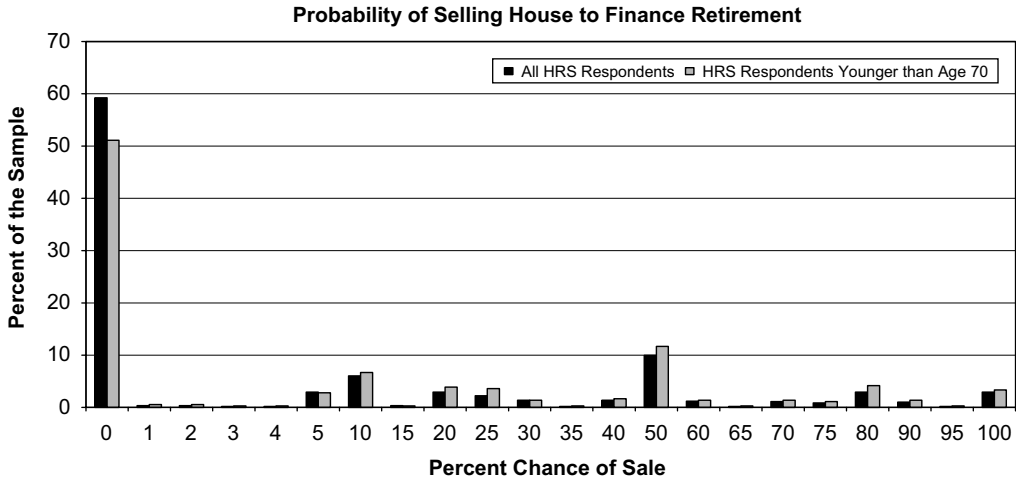


Fig. 1. Reported probability of selling house to finance retirement: EBB respondents (2004). Note: All data weighted using HRS household weights.

devised a special module for the 2004 HRS,⁹ where we asked homeowners the following question:

On (a) scale from 0 to 100, where 0 equals absolutely no chance and 100 equals absolutely certain, what are the chances that you will sell your house to finance your [(and your (husband/wife/partner)'s) retirement?

Answers to the question are reported in Fig. 1, which summarizes results for all respondents aged 50 and over in the 2004 HRS module (not just those in the EBB group); the results are also similar for respondents age 50–70. Some 60% of homeowners affirmed that they did not plan to sell their homes to finance retirement, and almost 70% of respondents felt there was a minimal (10% or less) chance they would sell their homes to pay for retirement. In other words, most older Americans do not plan to sell their homes to finance additional retirement expenses, though naturally this store of wealth helps cover housing consumption needs. In what follows, we both include and exclude net housing equity in the measures of wealth considered.¹⁰

We also analyze the potential distributional implications of a macro shock affecting the stock market instead of the housing market. Consider, for instance, how a stock market decline of 10% would influence Boomer wealth. Even if we assume that all IRA assets are held in stock (in addition to direct stock holdings), only 2% of their wealth would be lost in this event.¹¹ The drop in median wealth would be even smaller, only 1.1%. Essentially the small impact is explained by the fact that most Boomers do not hold equities, and those who do, hold small amounts.

⁹For detail on this module and the questions we inserted in it, see Lusardi and Mitchell (2006).

¹⁰Since this question is asked to older respondents, responses could simply reflect that (at least some) households have enough wealth for retirement and do not need to sell their house. In other words, answers to these questions may be influenced by the wealth households currently have. Unfortunately, we do not have data for young respondents.

¹¹The study by Gustman and Steinmeier (2002) comes to a similar conclusion.

2.2. Issues regarding business ownership

Earlier research has shown that business owners are very different from other members of the population.¹² As noted above, business owners are disproportionately found at the top of the wealth distribution and they are a very heterogeneous group. For example, 14% of business owners indicate they have no business equity, but median business equity is \$50,000 and those at the very top hold as much as \$20 million. Moreover, business owners hold a great deal of wealth in their businesses; over 40% of them hold a quarter or more of their wealth in this form.¹³

As in the case of housing, it is unclear whether business owners think of their business equity as an asset they will use to finance their retirement, and whether they plan to sell off their businesses when they retire. A large fraction of business owners explicitly state they will never retire completely (Hurst and Lusardi, 2007); since many business owners are self-employed, it is accordingly difficult to characterize exactly what “retirement” might entail for this group. There are also important measurement problems that arise when studying business owners. Tax evasion may drive some to underreport their income, and legal tax avoidance mechanisms can induce some owners to retain a portion of their compensation within their business.¹⁴ The percentage of business owners has fallen between the two cohorts, and so too has the share of total wealth invested in business equity (Table 3). Because we cannot fully account for all the nuances associated with business ownership, we exclude business owners in the multivariate analysis of savings.

3. Planning and wealth

One aspect of saving patterns that has received little attention to date is the fact that saving decisions are complex, requiring consumers to possess substantial economic knowledge and information. Our previous paper (Lusardi and Mitchell, 2006) used a special module covering a subset of 2004 HRS respondents and demonstrated that only a small fraction (less than a one-third) of older respondents ever tried to figure out how much they needed to save for retirement. The fraction of older persons reporting they not only tried but actually succeeded in developing a saving plan is even smaller (18%).¹⁵

One presumption of the theoretical life-cycle model of saving is that consumers are forward-looking and make plans for the future. To assess the empirical evidence for this

¹²See Hurst and Lusardi (2004, 2007) and Hurst et al. (2005). As Hurst and Lusardi (2004, 2007) have shown, business owners are more likely to be male, white, and married, and they also are more likely to come from families of business owners or highly educated families. They also have stronger ties with family and relatives; and they are more likely to have received and also to give money to family and relatives. Most importantly, business owners may display different motives to save than the rest of the population; they are not only much more likely to state they wish to leave a bequest to heirs but they are also less likely to be covered by pensions. Business owners may also need to maintain large amounts of working capital both to deal with necessities of their business and to maintain effective control over the business. Moreover, if households are compensated for taking greater risks with higher returns, it is again not surprising that business owners have higher wealth holdings than non-business owners.

¹³See also Gentry and Hubbard (2004).

¹⁴Holtz-Eakin et al. (1994) also emphasize the many tax incentives in business ownership.

¹⁵For additional evidence of lack of retirement planning, see Lusardi (1999, 2002, 2003), Ameriks et al. (2003) and Yakoboski and Dickemper (1997).

Table 4
Distribution of net worth by planning (\$2004)

Group	% of sample	25th percentile	Median	Mean	75th percentile
(A) Early Baby Boomers: age 51–56 in 2004					
Planning					
Hardly at all	27.9	9,000	79,000	315,579	271,000
A little	17.0	62,800	173,400	356,552	390,500
Some	27.7	51,000	189,000	365,354	447,200
A lot	27.4	54,000	199,000	517,252	470,000
(B) 1992 HRS cohort: age 51–56 in 1992					
Planning					
Hardly at all	32.0	10,100	76,910	224,3110	200,610
A little	14.3	37,700	126,560	343,110	292,170
Some	24.8	71,360	172,340	340,340	367,300
A lot	28.9	71,390	173,690	353,520	356,800

Note: All data weighted using HRS household weights.

point, we now focus on how much people have thought about retirement. The wording of the question in the HRS is as follows:

How much have you thought about retirement? A lot, some, a little, or hardly at all?

Results for both cohorts are presented in Table 4 (Panels A and B). As many as 28% of the early Boomers report that they have not thought about retirement at all, slightly fewer than the 32% in the 1992 HRS cohort.¹⁶ The fact that few people plan for retirement is also supported by many other studies that show that older workers are woefully underinformed about their old-age benefits. Indeed, in the 1990s, only half of prior HRS cohorts could identify what type of pension plan they had (defined benefit, defined contribution, or hybrid) and fewer than half could identify when they would be eligible for early or normal retirement benefits (see also Mitchell, 1988; Gustman and Steinmeier, 2004). Information about Social Security is also scanty. Only two-fifths of earlier HRS respondents could venture a guess about their expected Social Security benefits and many respondents knew little about program rules; over half of current workers expect to become eligible for full Social Security benefits at younger ages than are actually feasible (Gustman and Steinmeier, 2004; Employee Benefits Research Institute's Retirement Confidence Survey, 2001). Overall, households are quite uninformed about many of the key variables that should enter well-reasoned saving plans (Bernheim, 1998).

Also clear in Table 4 is the bimodal relationship between effort devoted to planning and household net worth. That is, those who report they undertook any planning—even “a little”—are much better off than those who said they planned “hardly at all.” In other words, undertaking even a little planning is associated with sizable wealth holdings, while non-planners display less wealth. The same pattern is present among the 1992 cohort. In other words, regardless of changes in home and stock prices, failure to plan for retirement for both cohorts is tantamount to having very little retirement savings. To highlight that

¹⁶Some households are not asked this question (for example, those who state they will never retire are not asked this question), so percentages refer to those who were asked. In our multivariate analysis, we add a dummy for this group of non-respondents.

planners hold substantially more wealth, we group households into two types: planners (those who have thought a lot, some, or a little about retirement) and non-planners (those who have thought hardly at all about retirement). At the median, planners hold double the amount of wealth of non-planners; differences are slightly less at the means. This is because there are a number of high-wealth households who do not plan for retirement.

We also find that non-planners are disproportionately concentrated among the least educated, and among Blacks and Hispanics.¹⁷ As shown in Table 2, these groups are also those with the lowest wealth levels. Next, we show that planning may provide an explanation for the differences in wealth holdings and why some households arrive close to retirement with little or no wealth.

3.1. Planning and financial literacy

One reason people fail to plan is because they are financially unsophisticated. Our prior research explored whether older respondents display basic financial literacy (Lusardi and Mitchell, 2006). Those results are not encouraging: half the respondents surveyed in our module cannot make a simple calculation regarding interest rates over a 5-year period and do not know the difference between nominal and real interest rates. An even larger percentage of respondents do not know that holding a single company stock is riskier than holding a stock mutual fund.

To pursue this question further in the present context we turn to the 2004 HRS, where respondents are presented with several questions that we use to assess financial and political literacy.¹⁸ Three financial literacy questions are asked, as follows:

If the chance of getting a disease is 10%, how many people out of 1,000 would be expected to get the disease?

If 5 people all have the winning number in the lottery and the prize is 2 million dollars, how much will each of them get?

For respondents who give the correct answer to either the first or the second question, the following question is then asked:

Let's say you have 200 dollars in a savings account. The account earns 10% interest per year. How much would you have in the account at the end of two years?

For each case, if the respondent gets the answer correctly, we set the answer equal to 1, and 0 otherwise. These are recoded as “Percentage Calculation,” “Lottery Division,” and “Compound Interest” variables respectively. We also define a “Political Literacy” variable equal to 1 if the respondent correctly knows the names of the US President and Vice President; this is likely to capture respondents’ awareness of future tax and macro-economic prospects.¹⁹

¹⁷For brevity, tables are not reported. For a detailed analysis of planning across cohorts and demographic groups, see Lusardi and Beeler (2006).

¹⁸Questions are also available on respondents’ success at counting backward and subtracting 7 from 100 five times. The answers to these calculations are highly correlated with the questions we take up in the text. Because these questions do not refer to economic calculations, we have not included them in our empirical analysis.

¹⁹These questions were asked only of respondents who entered the sample in 2004, so we lose approximately 600 observations when we consider these data.

Table 5
Financial literacy among Early Baby Boomers (N = 1,984)

Question type	Correct (%)	Incorrect (%)	Do not know (%)
Percentage calculation	83.5	13.2	2.8
Lottery division	55.9	34.4	8.7
Compound interest*	17.8	78.5	3.2
Political literacy	81.1	11.0	7.7

Note: The percentages do not sum to 100 due to a very small fraction of respondents who refused to answer the literacy questions. All data weighted using HRS household weights.

*Conditional on being asked the question.

Table 5 summarizes how this group of Boomers answered the economic and political literacy questions. While more than 80% got the percentage calculation right, only about half got the lottery division right. Only 18% could correctly compute compound interest; of those who got the compound interest wrong, 43% undertook a simple interest calculation thereby overlooking the interest which accrues on both principal and interest. Also note that a fifth of the sample could not name either the US President or Vice President.²⁰

Further detail on financial literacy appears in Fig. 2, which reports the distribution of correct responses for respondents in different educational and racial/ethnic groups. For all four measures, literacy rises steeply with education: the more educated are much more likely to answer the economic and political literacy queries correctly. These differences are statistically significant. Blacks and Hispanics are less likely to answer correctly than Whites (again differences are statistically significant), which may not be surprising as the former groups report lower wealth levels. Nevertheless, there are also sharp cross-question variations. For instance, all three racial/ethnic groups score over 50% on the percentage calculation, and all three score low on the compound interest question. These findings suggest that the HRS questions may be able to capture different types of financial savvy.

Table 6 reports Probit estimates of the effect of literacy on planning (being a planner is defined, as mentioned before, as having thought about retirement a little, some, or a lot). Across the board, financial literacy is important for planning. The most important variable, quantitatively, is the one reflecting knowledge of interest compounding, which makes sense inasmuch as it is critical for saving plans. It is also worth disaggregating those who answer correctly, those who answer incorrectly, and those who do not know the answers, so we can distinguish between knowledge versus lack thereof. People who are unable to divide the lottery winnings are less likely to be planners, and the effect is quantitatively important. Moreover, the knowledge of interest compounding and the inability to do simple calculations still have an impact on planning, even after accounting for demographic factors including education, race, marital status, number of children, retirement status, and sex.

²⁰Similar results about lack of financial literacy are reported by Bernheim (1995, 1998), Hogarth and Hilgert (2002), Hilgert et al. (2003), Moore (2003), Mandell (2004), and the National Council on Economic Education (2005).

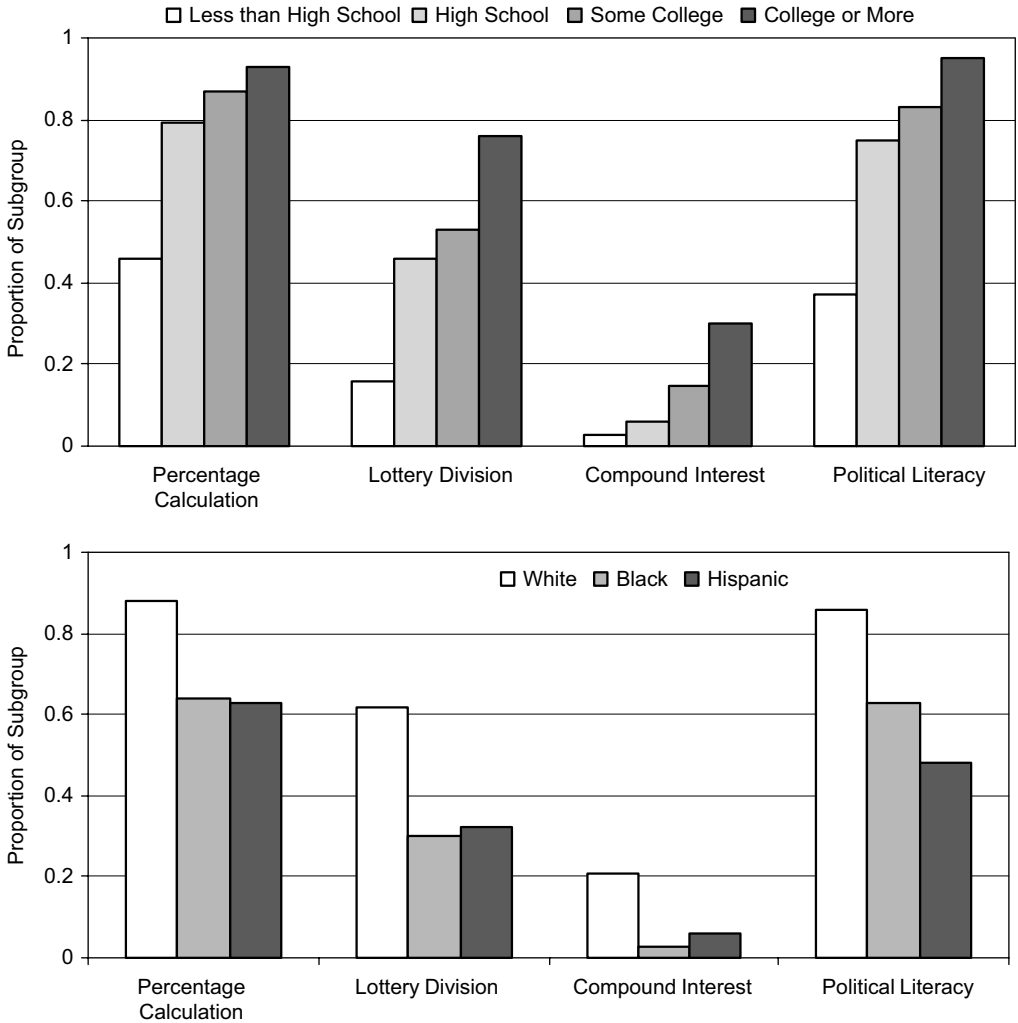


Fig. 2. Financial literacy by education and race/ethnicity: EBB respondents (2004). Note: All data weighted using HRS household weights.

3.2. The role of planning in retirement wealth accumulation

By influencing planning patterns, financial literacy may influence household saving outcomes. Several explanations might account for the empirical observation that planning is associated with higher retirement wealth. For instance, planning may be a proxy for personal attributes such as patience, diligence, or other factors associated with having a low discount rate—which are also likely to be associated with wealth. In this case, one might anticipate that controlling for socio-economic and demographic characteristics in multivariate wealth regressions would produce a cleaner estimate of the planning effect. To investigate the importance of this explanation in our dataset, we examine whether the positive relationship between levels of wealth and planning described in Table 4 persists

Table 6
 Probit analysis of the effect of financial literacy on planning (marginal effects reported (N = 1,716))

	Planners		
	1	2	3
Correct percentage calculation	−0.016 (0.061)	−0.012 (0.062)	−0.034 (0.060)
Correct lottery division	0.059* (0.030)	0.034 (0.031)	0.001 (0.032)
Correct compound interest	0.153*** (0.035)	0.149*** (0.035)	0.114*** (0.039)
Correct political literacy	0.104*** (0.032)	0.084** (0.040)	0.016 (0.042)
DK percentage calculation		0.021 (0.068)	0.054 (0.067)
DK lottery division		−0.154*** (0.050)	−0.141*** (0.051)
DK compound interest		−0.114 (0.080)	−0.073 (0.081)
DK political literacy		−0.019 (0.053)	−0.016 (0.054)
Demographic controls	No	No	Yes
Pseudo R ²	0.031	0.038	0.074

Note: Sample includes EBB members who responded to the financial literacy questions. Other controls include age, education, race, sex, marital status, retirement status, number of children. All regressions include a dummy for those who were not asked the question about interest compounding. DK indicates respondents who did not know the answer. All data weighted using HRS household weights.

* Significant at 10%; ** significant at 5%; *** significant at 1%.

after controlling for factors conventionally thought to determine wealth. Here we focus on total net worth and also on non-housing, non-business wealth; in addition we examine housing wealth in view of the widespread pattern of homeownership and the importance of housing in total wealth. We drop business owners from the sample and trim the bottom and top 1% of the wealth distribution to exclude outliers.

Our empirical strategy in Table 7 first controls for the conventional determinants of wealth likely to be associated with household permanent income and preferences. These include variables measuring respondents' educational attainment, sex, race/ethnicity, marital status, age, number of children, retirement status (whether fully or partly retired), and household income (in natural logs).²¹ Our strategy then adds to this canonical set of regressors a new determinant of wealth, namely the respondent's self-report of whether he is a planner. The test we perform is whether planning is associated with wealth outcomes after controlling for the conventional factors associated with saving. Further, by pooling the EBB and 1992 HRS samples, we can examine the effect of planning over time. The year dummy and the interaction between the year and the planner dummy test whether the wealth/planning relationship is changing over time. Inasmuch as wealth distributions are skewed, we perform both OLS and median regressions.

²¹Taking the log of income downweights outliers.

Table 7

Multivariate analysis of total net worth, non-housing wealth, and home equity on planning (pooled sample, EBB and 1992 HRS)

	Net worth		Non-housing wealth		Home equity	
	Median regression	OLS regression	Median regression	OLS regression	Median regression	OLS regression
Planning	21.995*** (6.014)	30.180** (12.326)	12.631*** (2.179)	24.788** (9.778)	8.701*** (2.519)	5.392 (5.335)
Year 2004	7.968 (7.320)	41.552*** (12.009)	0.476 (2.660)	16.789* (9.526)	7.367** (3.058)	24.763*** (5.197)
Plan*Year 2004	−0.967 (9.070)	5.949 (14.897)	−2.926 (3.290)	9.512 (11.817)	−0.448 (3.796)	−3.563 (6.447)
High school	10.769 (7.120)	17.748 (11.801)	3.627 (2.577)	10.034 (9.361)	3.388 (2.954)	7.714 (5.107)
Some college	23.965*** (7.943)	34.443*** (12.614)	10.766*** (2.882)	21.087** (10.006)	7.862** (3.300)	13.356** (5.459)
College	103.072*** (9.631)	150.674*** (14.696)	61.242*** (3.501)	93.442*** (11.657)	31.766*** (4.027)	57.232*** (6.360)
More college	145.688*** (10.360)	218.180*** (15.486)	82.859*** (3.756)	144.204*** (12.284)	46.969*** (4.320)	73.976*** (6.702)
Hispanic	−13.600* (8.034)	−34.615** (13.540)	−8.038*** (2.936)	−21.595** (10.740)	−6.442* (3.388)	−13.020** (5.860)
Black	−35.579*** (6.586)	−71.863*** (11.019)	−14.184*** (2.379)	−41.510*** (8.741)	−18.091*** (2.746)	−30.353*** (4.769)
Female	−1.209 (5.310)	−5.095 (7.610)	−4.973** (1.932)	−7.257 (6.037)	−0.578 (2.221)	2.162 (3.293)
Ln income	44.349*** (2.840)	67.538*** (3.969)	17.368*** (1.041)	46.888*** (3.148)	17.560*** (1.205)	20.650*** (1.718)
Constant	−503.476*** (45.805)	−764.305*** (67.952)	−219.109*** (16.867)	−572.005*** (53.903)	−202.902*** (19.481)	−192.300*** (29.409)
Adj. R ²	0.16	0.24	0.10	0.18	0.13	0.17

Note: Standard errors in parentheses. The dependent variable is divided by 1,000. Other controls include age, marital status, retirement status, number of children, a dummy for other race, and a dummy for those who are not asked the planning question. All data weighted using HRS household weights. Stars indicates levels of significance.

The estimates in Table 7 show that planning is strongly positively associated with higher total net worth in this multivariate framework. Thus, planning continues to have an effect on wealth, even after accounting for many demographic factors. The planning effect in columns 1–2 is sizable and does not change across cohorts: the median regression estimates indicate that those who plan accumulate close to 20% more total net worth, while the mean regressions indicate that those who plan accumulate 13% more wealth. For non-housing wealth (columns 3–4), the impact is larger; the median and mean estimates indicate that planners accumulate 32% and 19% more wealth respectively. Turning to home equity (columns 5–6), we note that those who plan accumulate 16% more wealth in home equity (median estimates). Other variables have the impacts that might be anticipated: both education and race/ethnicity remain strongly associated with wealth levels. Specifically, those with at least some college have far more wealth than those who did not complete high school, and Blacks have far less wealth than Whites, all else equal.

Married couples have higher wealth and so do high-income households, other factors constant.²²

3.3. Does planning affect wealth or does wealth affect planning?

These estimates confirm that planners accumulate larger amounts of wealth than non-planners. But if planning is correlated with unobservable character traits which cannot readily be controlled for, the measured planning effect might not be a true measure of the causal relationship we seek to assess. While this argument has some theoretical merit, it does not match findings from other studies. For example, Lusardi (1999, 2002, 2003) adds a long list of controls to wealth regressions to proxy for individual characteristics. She also adds subjective expectations about Social Security, house prices, and expected retirement ages. Her estimates of planning remain positive and statistically significant. Moreover, when she instruments for planning using the difference between the respondent's age and the age of his older siblings (a measure of planning costs), she concludes that the planning effects are again positive and statistically significant but even larger. Similar findings are offered by Ameriks et al. (2003).

Another possible confound is that planning may reduce uncertainty concerning future asset returns and future income. However, this works in the “wrong” direction, in that less uncertainty should lead to less rather than more wealth as the precautionary saving motive decreases. Ameriks et al. (2003) have data on measures of subjective uncertainty about income in their TIAA-CREF survey, but find little evidence that planners display lower subjective uncertainty concerning future income.

Yet another way in which planning may affect wealth is via portfolio choice. For instance, the financially and politically illiterate, who are less likely to plan, may also be unlikely to invest in high-return or tax-favored assets. This would lead to low savings, if combined with an elasticity of intertemporal substitution less than one. This view is consistent with Lusardi's (2003) evidence that planning increases stock ownership.

A different explanation about how planning might affect wealth is addressed by psychological research on self-control. If consumers want to save but simply lack the self-discipline to do so, planning might help consumers control their consumption (Ameriks et al., 2004). Related work by Gollwitzer (1996, 1999) demonstrates experimentally that people are more likely to achieve goals and translate their intentions into actions when they develop concrete plans. One striking finding from the psychological research is that a simple planning activity, such as getting experiment subjects to write down the specific steps they will take to implement a task, can greatly increase follow-through. These successes may help explain why merely thinking about retirement can produce wide differences in retirement wealth. Moreover, it may explain the bimodal distribution of wealth observed in Table 4, and why even “a little” or “some” planning generates large wealth differences, as compared to those who did not think about retirement at all.

Nevertheless, the causality may go the other way: for instance, wealthier households may plan more because they have more to gain by planning. On the other hand, wealthier households might not plan because they do not need to; they may already have enough for

²²We have also tried different empirical specifications. For example, we added controls for risk aversion and controls for subjective expectations about longevity and Social Security. Our main results remain unchanged and for brevity, we do not include these results in the table.

Table 8

Estimates of the effect of planning on net worth: OLS and instrumental variables regressions (pooled sample, EBB and 1992 HRS (N = 5,857))

	OLS estimate	IV estimate
Net worth	0.00007*** (0.00002)	-0.00008 (0.0002)
Hausman test (p-value)		0.59 (0.44)

Note: This table reports OLS and IV regressions of the effect of planning on total net worth (net worth divided by 1,000.) Standard errors in parenthesis with p-value in parenthesis for Hausman test. All data weighted using HRS household weights.

* Significant at 10%; ** significant at 5%; *** significant at 1%.

retirement. To assess the possible importance of such reverse causality in our sample of households nearing retirement, we first examine a regression where the dependent variable is being a planner, and then control for the same variables as examined previously in Table 7, with the addition of wealth. OLS estimates in Table 8 indicate that the scope for such a reverse causality effect is small: indeed, a wealth increase of \$1,000 would be interpreted as boosting the probability of planning only by less than 0.1 percentage point.

A further test must consider “exogenous” variations in wealth. In other words, we require an instrumental variable which is uncorrelated with unmeasured unobservables in the error term but correlated with wealth. We believe that an ideal instrument to assess the impact of wealth on planning is available from the housing market. In both 1992 and 2004, there were substantial changes in the housing market: in 1992, the economy was at the end of a housing price bust, whereas in 2004, the economy experienced a housing boom. In both instances, regional housing prices changed substantially across the US, creating changes in household wealth for reasons unrelated to individual unobservable characteristics. As an example, home prices rose between 2003 and 2004 by 10.3% in the Pacific region, but only 3.6% in the South. In 1992, the housing bust was particularly pronounced in New England, and less serious elsewhere. Accordingly, we use as an instrument for wealth the regional housing price changes in the previous year (2003–2004 for the EBB; 1991–1992 for the 1992 HRS cohort). We also note that changes in home prices affect more than home equity values; with the development of home equity lines of credit, increased home equity can easily be accessed by households.²³

Regional housing price changes are a good predictor of respondents’ net worth. The first-stage estimate of housing price changes is +12.729 with a standard error of 1.483; this implies that a 1% housing price increase raised wealth by over \$12,000.²⁴ Yet the instrumental variable estimates in Table 8 reveal that the effect of wealth on planning is not statistically significant. Considering each cohort separately, the effect of wealth is either statistically insignificant or negative. In other words, when people grow wealthier,

²³Hurst and Stafford (2004) document that households are willing to borrow (and lenders willing to lend) when capital gains on housing rise.

²⁴When we perform this regression in each year separately, we find that the first-stage estimate of housing price changes is +18.619 (s.e. 2.562) in 2004 and -2.936 (s.e. 1.626) in 1992.

they tend to plan less (and some wealthy households do not plan at all).²⁵ This underscores the fact that the OLS estimates of planning on wealth reported in Table 7 most likely underestimate the full effect of planning on wealth.

4. Conclusions

This paper takes several new steps in linking workers' financial literacy to their success at retirement planning and their accumulation of retirement wealth. First, we compare the net worth of the early Baby Boomer cohort in 2004 with that of another cohort of the same age (51–56) in another period of time (1992). We find that Boomers have higher levels of net worth than the previous cohort, principally because they hold more housing wealth. We also identify key differences in the distribution of wealth and conclude that the poorest Boomers are actually worse off than their earlier counterparts. The fact that wealth is very low for Blacks, and Hispanics, and the least educated did not change over time. In part this may be due to low levels of financial literacy among these groups.

Second, we show that respondents who report they planned for retirement enter their golden years with higher wealth levels. We further show that planning is strongly correlated with financial and political literacy and that the relationship between planning and wealth remains strong, even after controlling for many sociodemographic factors. We explore the possibility that it is wealth that affects planning rather than planning that affects wealth, but our statistical tests indicate this is not the case.

We believe that our research findings are particularly relevant in the current policy environment. For some time there has been substantial employer interest regarding ways to enhance worker retirement security. To this end, some firms have offered their employees retirement seminars (Lusardi, 2004), and financial advice provision has been made more feasible by the new Pension Protection Act of 2006. While some contend that such programs cannot do much to enhance retirement savings, our analysis implies that planning can actually jump-start the retirement saving process. A one-size-fits-all approach is unlikely to do much to build retirement wealth, and education programs must be targeted specifically to particular subgroups. Nevertheless, differences in planning behavior do help explain why household retirement assets differ, and why some people cross the retirement threshold with very low (or no) wealth.

As recently noted by Campbell (2006), it is often difficult for consumers to exhibit carefully reasoned and informed economic decisions:

[F]or many households, the discrepancies between observed and ideal behavior have relatively minor consequences and can easily be rationalized by small frictions that are ignored in standard finance theory. For a minority of households, however, particularly poorer and less educated households, there are larger discrepancies with potentially serious consequences.

Our findings provide support for this statement and highlight the fact that specific groups in the economy, particularly those with low education, low income and Black and Hispanic households, are at risk of not preparing adequately for their retirement.

²⁵See Lusardi and Beeler (2006) for detail.

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