

# Retirement Consumption: Insights from a Survey

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## Abstract

Prior research has established that consumption falls significantly at retirement. What is not known is the extent to which this fall is anticipated during the working years. Using data from a new survey, we show that many working households do expect a considerable fall in consumption when they retire. In fact, those who are already retired report significantly smaller falls in consumption than are expected by those who are still working.

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# 1 Introduction

The facts are not in dispute. Many households spend a great deal less after retirement than they did before (Hamermesh [1984], Mariger [1987]).<sup>1</sup> Yet the interpretation is hotly disputed. Is or is not this finding consistent with standard theories of saving? Banks, Blundell, and Tanner [1998] argue that absent large shocks, the fall in consumption expenditure is too large to be explained in the life-cycle framework: “the only way to reconcile fully the fall in consumption with the life-cycle hypothesis is with the systematic arrival of unexpected adverse information.” Bernheim, Skinner, and Weinberg [2001] go one step further, and argue that the “unexpected” information is the level of retirement wealth itself: “many retirees... take stock of their finances only to discover that their resources are insufficient to maintain their accustomed standard of living.” If correct, this argues not only against the life-cycle model, but against all forward-looking theories of consumption.<sup>2</sup>

The findings of both Banks et al. and Bernheim et al. suggest that realized levels of consumption in retirement systematically disappoint expectations. But because these studies focus solely on realizations, the evidence for the disappointment of expectations is incomplete. The findings of Aguiar and Hurst [2004] suggest that a significant fall in spending at retirement may rationally be anticipated based on the increase in the amount of time available for activities such as shopping and food preparation. This debate will be resolved only when we are able to achieve a closer understanding of expected consumption levels among those who are approaching retirement. Improved understanding of these expectations is critical not only for purposes of discriminating among economic models, but also for deepening our understanding of the process of wealth accumulation. It is also vital to the current debate on the adequacy of the U.S. savings rate (Engen, Gale, and Uccello [1999] and Mitchell, Hammond, and Rappaport [2000]).

In this paper we use new data from two recent surveys of some 2,000 TIAA-CREF participants to improve our understanding of both expected consumption levels among those who are approaching retirement, and realized consumption among those who recently retired. Section 2 provides a description of our sample and the surveys. Our findings on expected consumption are outlined in section 3. We find that households in the pre-retirement period generally expect significant falls in spending at retirement. In quantitative terms, our results on expectations suggest that a typical U.S. household

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<sup>1</sup>The precise size of the fall in consumption has not been definitively pinned down. Mariger [1987], using a structural model of lifetime consumption, finds that retired adults in the Consumer Expenditure Survey consume 43% less than do working adults. Banks et. al [1998] estimate a 35% decline using the British Family Expenditure Survey. Bernheim et. al. [2001] calculate a smaller average 10%-20% downward shift in the consumption profile around the time of retirement in their sample taken from the PSID. Hurd and Rohwedder [2005] estimate the decline at 15-20%.

<sup>2</sup>Bernheim et al. conjecture that their results may be related to self control problems. Diamond and Koszegi [2002] produce a model in this spirit, in which households naively expect to retire relatively late in life. In practice, they find it overwhelmingly tempting to retire early, and as a result face a drop in consumption larger than they anticipated.

expects roughly a 20% fall in consumption at retirement, which is in line with the findings of Bernheim et al. on realized consumption levels. Our data also reveal that less wealthy households anticipate a greater fall in consumption than do wealthy households, matching Bernheim et al.'s finding concerning outcomes. Section 4 analyzes consumption realizations among retirees. Rather than having unexpectedly low consumption due to adverse shocks, many retired households appear to be consuming more than expected. This finding and the possible explanations for it are detailed in section 4.

Our results do not support the claim that the fall in consumption at retirement represents a surprise to households. Hurd and Rohwedder [2005] have produced complementary evidence indicating the extent to which actual declines in consumption at retirement are anticipated. Together, these findings suggest the value of exploring theories in which a significant fall in consumption at retirement is anticipated well in advance, as in Aguiar and Hurst [2004].

## 2 Background

### 2.1 The Surveys

The data used in this paper are drawn primarily from two surveys sent to a sample of TIAA-CREF participants: the Survey of Participant Finances (SPF) conducted in January 2000, and the Survey of Financial Attitudes and Behavior (FAB) conducted in January 2001. The SPF was designed to examine in detail the type and the amount of financial assets owned by a sample of TIAA-CREF participants. The FAB explored these participants' financial preferences, expectations, and attitudes. The sample for both surveys comprises members of the "TIAA-CREF Research Panel." This panel started in 1993 as a random stratified sample of TIAA-CREF participants, but subsequent replacements were not designed in a manner that preserved randomness.

At the end of 1999, the Research Panel comprised some 9,234 households. The SPF was mailed to this group in January 2000. In total, 2,835 households responded to that survey, for an overall response rate of 30.7%. The universe for the FAB comprised 2,687 of the 2,835 households who had responded to the SPF; the difference being accounted for by changes of address, death, requests to be removed from the panel, etc. We followed procedures suggested by Dillman [1978] to boost the response rate, and 2,064 of the 2,687 households responded to the FAB (76.8%).

### 2.2 The Sample

We divide our sample into two groups based on labor force participation. To preserve a clear distinction between retired and nonretired households in multi-person households, we define the household to be working only if no adult member is retired and to be retired only if all adults are retired. Of the 2,064 respondents who filled out the FAB, 1,074 were in working households, while 735 were in retired households. The remaining

255 respondents were either in partially retired households or provided insufficient data to be clearly categorized. These households were therefore left out of the analysis.

Table 1 shows demographic information on the working and the retired households in the sample. The educational, and occupational characteristics of the retired households in our sample are very similar to those of the working households. Not surprisingly, given our data source, the sample is extremely well-educated. Roughly 1 in 3 have Ph.D's, while fully 70% undertook at least some post-college education. In terms of employment, more than 1 in 3 are teaching faculty, while the majority of the others have management or professional positions. However, some 20% of the sample are in more blue-collar jobs, such as maintenance and secretarial positions.

Table 2 presents additional qualitative data on our sample, including information on home ownership, retiree health and long-term care insurance coverage, and defined benefit pension plan coverage. The table shows that a very high proportion of the sample own their homes rather than rent them. The majority of working owners have positive balances remaining on their mortgages, while the majority of retired owners have no remaining mortgage. With respect to health care, roughly 50% of households have at least one member of the household with employer-provided health insurance extending into retirement, but very few have coverage for long term care. About a quarter of the respondents in working households, and a third of those in retired households, indicated that they participate in a defined benefit pension plan (of course, this pension plan is in addition to any TIAA-CREF and/or other defined contribution pension plans).

Table 3 contains economic data on the working and retired households in the sample. We have measures not only of total net worth, but also the breakdown among various subcategories of assets and debts. Complete wealth data was provided by 55% of those who are working households, and 40% of retired households.<sup>3</sup> Among the working households in our sample, the mean level of employment income in 1999 is \$87,000, with a median of \$73,000. The mean level of total net worth in 1999 among the working households in our sample is \$737,000, with a median of \$368,000. Clearly these are far higher (especially the wealth numbers) than for the general population.

The survey data that we are using clearly do not comprise a representative sample of the U.S. population, and we do not argue that our results can be construed as population estimates. Yet it is unclear why such selection would systematically bias our analysis of behavior and retirement expectations and outcomes. One benefit of our sample is that higher education and research has historically been a stable industry, making possible the analysis of financial choices in an economic environment that is relatively isolated from exogenous disturbances.

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<sup>3</sup>Ameriks, Caplin, and Leahy [2003] present evidence on the high quality of the wealth data, based on a comparison between self-reported TIAA-CREF asset holdings and administrative data. Response to the wealth questions does not appear to affect the demographic characteristics of the sample.

## 2.3 The Questions

We asked survey participants to respond to the following question on retirement consumption. In the remainder of the paper, we will refer to this as the retirement consumption question.

- For many households, overall spending changes dramatically upon retirement. Please indicate below (what) your experience has been (if you are retired), or what your expectations are (if not retired)
  - My household had (or expects to have) no change in spending at retirement
  - My household has spent (or will spend) more after retirement than before
  - My household has spent (or will spend) less after retirement than before

This question is designed to accord with the common-sense notion of consumption as directly tied to expenditures, rather than the “flow of consumption services” notion that accords more closely with economic theory. On the one hand, this makes our question easy to understand, which may have contributed to the high response rates. On the other hand, it exposes us to potential ambiguities, such as whether or not respondents include debt repayments (especially mortgage payments) as part of their overall spending. Fortunately, we have a great deal of data enabling us to explore these and other possible ambiguities, as outlined in Section 4.<sup>4</sup>

In the second part of the retirement consumption question, we asked for more precision from those who reported expecting a change or an expect change in spending at retirement:

- About how much more or less (as a percentage of your annual pre-retirement spending)?

We imputed an answer of zero to this question for all those who responded with “no change” to the first part of the consumption question.

The vast majority of respondents answered the retirement consumption question. 90% of the sample answered the first part, and of those who were eligible, 90% provided a closest estimate in the second part. Conditioning on the response to these questions does not affect the economic or demographic characteristics of the sample in any significant way.

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<sup>4</sup>Aguiar and Hurst (2004) suggest that the decline in spending at retirement is due to a decline in the price level faced by retired households. Given our focus on spending, we will not be able to distinguish between a decline in prices and a decline in consumption.

### 3 Findings

Figures 1 and 2 present the distribution of responses for working and retired households respectively. Several features of the data are immediately apparent. Most prominent is the spike at zero. There are two reasons for this, both of which are related to the fact that we have imputed a value of zero for those who report “no change” to the first part of the consumption question. The first is the failure of some of those who report actual or expected changes in the first part of the consumption question to provide a numerical value in the second part. In this sense, we oversample those who report “no change”. In the empirical analysis below, we reweight the data to reflect these sampling probabilities where appropriate.

The second reason for the spike at zero is that respondents appear to have reported no change instead of small positive and negative changes.<sup>5</sup> Given the negative tilt of the distribution of expectations, this probably biases us against finding expected declines in consumption by working households. In an earlier version of the paper we modelled the rounding process, estimated the underlying distribution, and found this bias to be quite small (See Ameriks, Caplin, and Leahy [2002]). We will therefore ignore rounding in what follows.

A second feature of the data is that 5% of households reported expected falls in consumption of either 80% or 90%. Not only do such huge declines in consumption seem a priori unlikely, but also there were very few households in the 51%-79% range.<sup>6</sup> We view these data points as suspect and therefore exclude them from the analysis below. Note that this correction again works against the hypothesis that agents anticipate a decline in consumption at retirement.<sup>7</sup>

A casual look at Figures 1 and 2 does not reveal any indication that our consumers are surprised by declines in consumption at retirement. If anything, the working appear to expect a decline that is greater than that which is realized by the retired. In what follows we take a more formal look at these features of the data.

#### 3.1 Expectations

Table 4 presents basic summary statistics concerning the answers to the retirement consumption question among working households. We present data both for the entire working population and for a second group, the “regression sample”. The regression

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<sup>5</sup>There is also evidence of rounding to the nearest 5 and 10.

<sup>6</sup>It is possible that these households reported the “replacement rate” (the ratio of retirement spending to pre-retirement spending) rather than the fall in spending. The demographic characteristics of this group are closer to those who expect small declines than large declines. A model in which a certain fraction of respondents mistakenly report  $100 - x$  instead of  $x$  fits the data remarkably well. See Ameriks, Caplin and Leahy (2002).

<sup>7</sup>We tried a number of robustness checks. We included these observations as reported, and inverted them under the assumption that these agents incorrectly reported the replacement ratio rather than the decline in consumption. These adjustments do not affect the qualitative conclusions of our analysis.

sample, which is used in Tables 5 and 6, satisfies the two conditions: respondents report that they are no more than 20 years to retirement and provide complete wealth data.<sup>8</sup> We begin with a sample of 1,074 working households. About one half provide complete wealth data. About 60% of the remainder expect to retire within 20 years. This leaves us with just over 300 observations in the regression sample.

Table 4 makes clear what is apparent from Figure 1: the majority of households expect consumption in retirement to fall, with a mean expected fall of just over 11%. The table also reveals profound heterogeneity of expectations. The mean expected fall in consumption among those expecting a fall is about 25%, while the mean expected increase among those expecting an increase is about 22%.

These estimates of the expected decline in consumption are of similar magnitude to the estimates obtained by others of the actual decline in consumption at retirement. Hamermesh [1984] estimated the decline in consumption at retirement was 9% over two years. Bernheim et al. estimate an average decline of 14%. Hurd and Rohwedder [2005] estimate the decline at 15-20%. Mariger [1987] and Banks et. al. [1998] estimate larger declines of greater than 30%.<sup>9</sup>

### 3.1.1 The Determinants of Expectations

In this section we investigate the determinants of the expected change in consumption. In Table 5, we present the results of an ordered probit on the first part of the consumption question. The dependent variable is one if the respondent expects consumption to increase at retirement, minus one if the respondent expects consumption to decrease, and zero if the respondent expects no change. Table 6 presents results of a weighted OLS regression. The dependent variable is the expected change in consumption (in percentage points).

We consider three types of controls. The first set are measures of financial wellbeing. Bernheim et al. have shown that the decline in consumption at retirement diminishes with income and net worth. For this reason, we include measures of household income, non-pension wealth, defined contribution (DC) pension wealth, and debt. We separate DC wealth from other types of wealth because the motives, incentives, and process of accumulating wealth in DC pension accounts may be very different from how wealth is accumulated outside of such arrangements. For example, the terms of a pension arrangement may be determined by an employer, and there are typically restrictions or penalties for early withdrawal of such assets. In addition, because it is unclear whether households

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<sup>8</sup>We limit our analysis to households who are no more than 20 years from retirement to retain some degree of homogeneity. In fact, our data suggest that households with greater than 20 years to retirement expect significantly smaller falls in consumption. Many interpretations are possible: it may be that these households intend to save more than their parents or they may be naive (in the sense of O'Donoghue and Rabin [1999]) about their ability to save for their old age.

<sup>9</sup>Many of these studies consider log changes in consumption rather than percent changes. Given the concavity of the log transform, this tends to magnify the expected decline in consumption. When we express our data as log changes, the mean decline in consumption is 15 percent.

treat the value of homes and other real estate similarly to other assets, we present results using two different measures of non-pension wealth. In the leftmost columns, non-pension wealth includes real estate; in the rightmost columns, nonpension wealth includes only financial assets.

The second set of controls include variables meant to capture differences between our expenditure based definition of consumption and the economically meaningful flow of services definition. Here we include measures of home ownership and retiree health insurance coverage. Some households may change status from owners to renters at or around retirement, and may interpret this change as a change in consumption. If someone does not have retiree health insurance coverage, they may interpret the increase in premiums as an increase in consumption. Debt, which was included among the financial measures, may also play a role here. Retired households typically have much lower debt levels than working households; the reduction in debt service may be interpreted by some as a fall in consumption.

Finally, we include a number of demographic controls such as the respondent's gender, marital status, number of children, years to retirement, and indicators of education and occupation.

The main result of this analysis is a robust correlation between financial status and the decline in consumption at retirement. Less wealthy households expect greater declines in consumption at retirement. This relationship is strongest for non-pension wealth, but other financial variables such as defined contribution pension assets, income and debt show similar, albeit less consistently significant, effects.<sup>10</sup> A second finding is that variation in the expected change in consumption at retirement does not appear to be the result of ambiguities in the definition of consumption. The indicators of potential ambiguities are statistically insignificant, except for debt which may also be an indicator of the financial position of the household. As previously noted, debt may affect respondents perceived spending since debt levels are generally lower in retirement. Another possibility is that debt levels proxy for self control problems that cause consumption to vary more closely with income than it would in the standard life-cycle model.<sup>11</sup> More research is needed to clarify the relationship between debt and consumption in retirement.<sup>12</sup>

We investigated a number of alternative specifications of the regressions in Tables 5 and 6. We dropped households with heads over the age of 65, since people who choose

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<sup>10</sup>Bernheim et al. document a negative correlation between the wealth-to-income ratio and the decline in consumption at retirement. In Ameriks, Caplin and Leahy [2002], we investigated a specification that matched closely the methodology of Bernheim et al. To a crude first approximation, our results for expectations were similar to theirs for outcomes, but with less variation in the decline in consumption, as is to be expected from a more homogeneous sample.

<sup>11</sup>See, for example, Laibson, Repetto, and Tobacman [2003].

<sup>12</sup>One puzzling finding is the negative and highly significant coefficient in the ordered probit regression on the indicator that the respondent has a defined benefit plan. One possibility is that paradoxically this too proxies for a weak financial position. Defined benefit plan participants tend to hold fewer assets, and much fewer defined contribution assets, than do the rest of the sample. Other characteristics of the two groups are similar.

to continue working might somehow be different. We included dummy variables for zero, one, two and three or more children, since family size may not affect consumption linearly. We limited the sample to those within 10 years of retirement. None of these alterations affected the results in any significant way.

We conclude that the correlation between wealth and the decline in consumption at retirement is not the result of a surprise occurring at retirement. One possible explanation would be based on differences in the desire to save for retirement. If households differ in their preference for consumption in retirement relative to consumption in the working years, then those who desire a higher relative level of retirement consumption will be accumulating more wealth in order to pay for it. Another possible explanation would be based on differences in self-control. Households with less self-control may accumulate less wealth and see their consumption decline along with their income at retirement.

## 3.2 Realizations

Table 7 presents simple summary statistics of the answers of retired households to both parts of the retirement consumption question. The first set of rows relate to all retired households, while the second set refer only to those who retired within the least ten years.

The main finding is immediately obvious: retired households, even those who retired recently, have generally had smaller falls in consumption than is anticipated by those who are still working. While more than 55% of working households in our sample expect consumption to fall, less than 40% of the retired reported that they had experienced such a fall. On the other side of this, while less than 10% of working households in our sample expect consumption to rise, nearly 20% of the retired households experienced such a rise. The mean expected change in consumption at retirement is -4.6 percentage points, as compared to an expected change of -11.3 for working households.

The final rows of Table 7 give numbers for those who retired in the last ten years either at age 62 or age 65. The fact that the results are essentially identical for this group is relevant to theories that stress the importance of shocks that induce early retirement in causing expectations to diverge from outcomes. On the one hand, as in Hausman and Paquette [1987], retirement may coincide with a negative health shock, or even with the negative wealth shock of being fired. In this case, we would expect those who retire early to consume less in retirement than expected. On the other hand, it may be that households who get unusually positive wealth shocks tend to retire quickly, in which case consumption realizations will exceed prior expectations. The reason that ages 62 and 65 play a special role in evaluating the importance of these effects is that they are known to be especially prevalent as years of retirement (Phelan and Rust [1997]). Our data reveal that fully 1/3 of retirees who report a retirement date give one of these two ages, while close to 40% of those who are still working report expecting to retire at one of these two ages. It is therefore reasonable to conjecture that most who retired at 62 or 65 did so according to a prior vision little impacted by shocks to health or wealth. The fact that this makes little difference to the outcomes suggests that retirement age shocks do not

account for the observed wedge between expectations and outcomes.<sup>13</sup>

## 4 Discussion

### 4.1 Explaining the Difference between Expectations and Realizations

At first view, the results reported above cast strong doubt on the “negative shock” hypothesis of Banks et al. The shock, if there is one, appears to go in the opposite direction. What then explains the difference between expectations and realizations?

There are three possibilities. First, instead of receiving a negative shock to wealth at retirement, our retired households may have been pleasantly surprised by a positive shock to their retirement resources. Second, differences in the samples may explain the differences between expectations and outcomes. We do not have a panel data set. The data on realizations are supplied by different households than the data on expectations. Third, the retired may have discovered upon retirement that their needs were greater than anticipated, and decided to cut their planned bequests. We discuss each of these possibilities in turn, beginning with the first.

#### 4.1.1 Positive Surprise

It must be recognized that this sample is drawn from a very particular time in which the equity boom induced a positive shock to the asset portfolios of many households. Those retiring in the late 1990s may have had large increases in financial wealth, leading to significant increases in consumption at the time of retirement. Households who had not yet retired are likely to have responded to such windfall gains by increasing both current and expected future consumption. For this reason our measures of realizations for retirees may systematically exceed our measures of expectations for preretirees. The potential power of this effect in our sample is highlighted by the fact that equity shares are large. The median working household in our sample has more than 50% of its financial wealth in equities. Even among retirees, who generally hold fewer stocks, the median share of financial wealth in equities is close to 40%. In stark contrast, the median equity share in the general population of retired households is at or close to zero.

To investigate the effect that equity holdings have on the observed differences between expectations and outcomes, we pool our sample. This will also allow us to investigate the importance of differences between the characteristics of the two subsamples. We make two assumptions: (1) that consumption expectations depend on demographic characteristics and retirement wealth, and (2) that any expectational errors are uncorrelated with these characteristics. With these assumptions, we can pool our two samples, subject to two

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<sup>13</sup>The table shows lower variance in the change in consumption among those who retired at 62 or 65. This suggests that those who do not retire at these ages may be subject to some combination of positive and negative shocks.

adjustments. First, because retirees are reporting realizations and preretirees are reporting expectations, we expect heteroscedasticity in the errors across the two sub-samples. We use a Huber-White calculation to correct for this heteroscedasticity. Second, whereas for non-retirees current wealth and portfolio allocations are uncorrelated with any shock occurring at retirement, current wealth and portfolio allocations for retirees will be correlated with any unanticipated increases in wealth that occurred at the time of retirement. We can exploit this difference to test for the impact of the such surprises on consumption changes. By interacting wealth and portfolio shares with an indicator of retirement, we can pick up the correlation with news at retirement.

We use a simple regression to confirm that equities appear to play a large part in explaining the high realized level of retirement consumption, and to control variation in the demographic characteristics of retirees and preretirees that may account for differences in expectations and realizations. In this regression, we interact log of net worth and equity share in financial assets with a retirement status indicator, and test whether these variables are related to differences between expected and actual changes in consumption at retirement. Table 8 summarizes results of a pooled regression.<sup>14</sup>

As hypothesized, we find that the equity effect is entirely irrelevant for working households, yet has a significant positive impact on actual consumption among retired households. Once the equity effect is removed, there appears to be no significant impact of retirement on the change in consumption. In fact the test for the joint significance of the retirement dummy and the retirement wealth coefficient has a p-value of only .3.

The average equity share for retirees is roughly 60%. Given the estimated coefficient on the equity share, we would expect that a 65 year-old household with no equity would have a decline in consumption at retirement that is 18% greater than average. This is about the same order of magnitude as the gap between the expectations of our working households and the realizations of our retirees.

These results are of course only suggestive of an effect of equity on the realized change in consumption at retirement. Any formal comparison has to take account of the possibility that people reallocate their portfolios at retirement. We cannot control for this effect in our cross-sectional data.<sup>15</sup>

#### 4.1.2 Demographic Differences

To investigate demographic differences, first regressed the indicator of retirement on our demographic characteristics. The retired were less likely to have kids, less likely to never have been married, and more likely to have long term care insurance. Since none of these variables have been found to affect either expectations or realizations, this type of sample selection does not appear to explain the difference between expectations and outcomes.

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<sup>14</sup>We also ran the regression for the retired and non-retired households separately. The effect of the non-wealth variables were remarkably consistent across samples.

<sup>15</sup>Ameriks and Zeldes (2001) provide evidence that very few individuals reallocate portfolios at retirement. Those who do tend to move away from stocks.

We also investigated whether the demographic characteristics had different effects on the expectations of the working and the realizations of the retired. Beyond the effect of equity already discussed, no other variable had a differential effect.

Another type of selection that in principle may matter is the selection into retirement. If those with certain expectations are more likely to retire early, then we may see a difference between the expectations of the nonretired and the realizations of the retired. To evaluate this possibility we re-ran the regression of Table 8, considering only respondents who either retire at 62 or 65 or plan to do so. The idea is that considering only standard retirement ages should reduce this early-retirement selection problem. The results of this regression were qualitatively and quantitatively similar to those in Table 8, suggesting that this type of selection is not driving the difference between expectations and outcomes.

We can find no evidence that selection is driving the difference.

### 4.1.3 Spending

Our third candidate is that some agents are surprised by the cost of retirement, and that they cut bequests as a result. To get at this possibility we asked retired households:

- If you are currently retired, how do your spending needs in retirement compare with those you expected before you retired:
  - About what you expected
  - Higher than you expected
  - Lower than you expected

Table 9 presents the basic data on this spending needs question. The dominant feature is the large number who report not having been surprised. The second feature is the apparent, if small, bias in the direction of surprise. More households report being surprised by how high were their expenses in retirement rather than by how low they were.

We regressed the reported change in consumption at retirement on the answers to the spending needs question and the additional controls included in Table 5. As expected, a surprise increase in spending needs lessens the fall in consumption at retirement. The effect is large and significant and explains a significant portion of the cross-sectional variance in the realized change in consumption at retirement. The coefficient on the spending needs question is .68 (note that both the change in consumption and the surprise in spending needs are coded such that .01 is 1%), which given the standard error of .22 is significant at the 0.3% level. A one standard deviation increase in spending needs is a change of .11, which given the estimated coefficient, gives rise to a 7 percentage point increase in consumption at retirement.

In spite of this large effect, these surprises do not go far in explaining differences that we have seen between expectations and outcomes. The mean answer to the spending

needs question is .0035. Given the estimated coefficient, this can explain retirement consumption that is about one-quarter of a percentage point higher than expected.

We conclude that portfolio effects are the main candidate to explain the difference between expectations and outcomes in our sample.

## 4.2 Discrete or gradual change?

We want to interpret the answers to our consumption question as pertaining to the discrete change in spending that appears to occur at or around the time of retirement. For this reason the question refers to “dramatic” changes “upon” or “at” retirement. Still, it is possible that some respondents may have interpreted the question as pertaining to the change in some average of consumption during pre- and post-retirement years. If consumption is declining over time, as most studies of retirement consumption find, then these agents might report a decline in consumption even though they do not experience a break at retirement.

We believe that the evidence favors the change-at-retirement interpretation over the average-of-pre-and-post-retirement misinterpretation for several reasons. There are two ways in which one might average consumption prior to retirement: average over a fixed horizon or average over the remaining years to retirement. If respondents were averaging their consumption between the date of response and retirement, we would expect either age to be positive and significant or years-to-retirement to be negative and significant in the regressions of Tables 5 and 6. In fact these coefficients are either insignificant or of the wrong sign.<sup>16</sup> If they were averaging over a fixed horizon, we would expect the stock holdings to affect the expected change in consumption, as it does the realized change. Working households, however, do not appear to be averaging their pre- and post-boom consumption. We also see little evidence of averaging among the retired. In Table 7 those within 10 years of retirement report similar declines as the sample as a whole.

Finally, even if the question were misinterpreted, the answers are still interesting. Any surprise reduction in consumption at retirement would show up as a systematic difference between expectations and outcomes. The finding that there is no such gap seems rather powerful, especially given that the decline in consumption at retirement is generally regarded as being an order of magnitude greater than the trend in consumption before or after retirement. The only way to rescue the surprise is to claim that there is a systematically different interpretation of the question between those in the pre-retirement and the post-retirement periods.

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<sup>16</sup>We also restricted the sample to those within ten years of retirement. This had little quantitative or qualitative effect on the results.

## 5 Concluding Remarks

While sharp, the fall in consumption at retirement may nevertheless be anticipated well in advance.

## References

- [1] Aguiar, M, and E. Hurst, 2004, "Consumption vs. Expenditure", NBER Working Paper No. 10307.
- [2] Ameriks, J. A. Caplin, and J. Leahy, 2002, "Retirement Consumption: Insights from a Survey," NBER Working Paper No. 8735.
- [3] Ameriks, J., A. Caplin, and J. Leahy, 2003, "Wealth Accumulation and the Propensity to Plan." *Quarterly Journal of Economics*, vol. 118, 1007-1048.
- [4] Ameriks, J. and S. Zeldes, 2001, "How do Household Portfolio Shares vary with Age?" Columbia University Graduate School of Business Working Paper.
- [5] Banks, J., R. Blundell, and S. Tanner, 1998, "Is There a Retirement Savings Puzzle?" *American Economic Review*, vol. 88, 769-788.
- [6] Bernheim, D., J. Skinner, and S. Weinberg, 2001, "What Accounts for the Variation in Retirement Wealth Among U.S. Households." *American Economic Review*, vol. 91, 1-26.
- [7] Diamond, P., and B. Koszegi, 2002, "Quasi-Hyperbolic Discounting and Retirement." Working Paper, MIT.
- [8] Dillman, D., 1978, *Mail and Telephone Surveys: the Total Design Method*, Wiley and Sons, New York.
- [9] Engen E., W. Gale, and C. Uccello, 1999, "The Adequacy of Household Savings." *Brookings Papers on Economic Activity*, vol.2, 65-165.
- [10] Hamermesh, D., 1984, "Consumption During Retirement: The Missing Link in the Life Cycle." *Review of Economics and Statistics*, vol.66, 1-7.
- [11] Hausman, J. and L. Paquette, 1987, "Involuntary Early Retirement and Consumption." in Gary Burtless ed., *Work, health, and income among the elderly*, Washington D.C., the Brookings Institution.
- [12] Hurd, Michael and Susan Rohwedder, 2005, "The Retirement-Consumption Puzzle: Anticipated and Actual Declines in Spending at Retirement", RAND Labor and Population working paper series, WR-242.
- [13] Laibson, David, Andrea Repetto, and Jeremy Tobacman, 2003, "Wealth Accumulation, Credit Card Borrowing and Consumption-Income Comovement," Working paper, Harvard University.
- [14] Mariger, R., 1987, "A Life-Cycle Consumption Model with Liquidity Constraints: Theory and Empirical Results." *Econometrica*, vol. 55, 533-557.

- [15] Mitchell, O., P. Hammond, and A. Rappaport, eds., 2000, *Forecasting Retirement Needs and Retirement Wealth*, University of Pennsylvania Press, Philadelphia, Pa.
- [16] O'Donoghue, T., and M. Rabin, 1999, "Doing it Now or Later." *American Economic Review*, vol. 89, 103-124.
- [17] Phelan, C., and J. Rust, 1997, "How Social Security and Medicare Affect Retirement Behavior in a World with Incomplete Markets." *Econometrica*, vol. 65, 781-832.

**Table 1**  
**Demographic Characteristics of 2001 Survey Respondents**

Characteristic	Working Households		Retired Households		Total	
	(n)	(%)	(n)	(%)	(n)	(%)
Gender						
Female	480	44.7	334	45.4	814	45.0
Male	594	55.3	401	54.6	995	55.0
Marital Status						
Curr. married	690	64.6	465	63.4	1,155	64.1
Prev. married	179	16.8	182	24.8	361	20.0
Never married	199	18.6	87	11.9	286	15.9
Education						
College or below	281	26.2	247	33.6	528	29.2
Masters or Prof.	411	38.3	243	33.1	654	36.2
Ph.D.	382	35.6	245	33.3	627	34.7
Occupation						
Teaching faculty	382	35.6	325	44.5	707	39.2
Mgmt., Sen. Admn.	216	20.1	116	15.9	332	18.4
Other Tech./Prof.	267	24.9	120	16.4	387	21.5
Other	207	19.3	169	23.2	376	20.9
Age						
Below 35	112	10.5	0	0.0	112	6.2
35-44	209	19.6	0	0.0	209	11.6
45-54	382	35.8	10	1.4	392	21.8
55-64	272	25.5	117	16.0	389	21.6
65-74	84	7.9	388	52.9	472	26.2
75+	9	0.8	218	29.7	227	12.6
Years to/from retirement						
0-5	191	20.3	195	35.5	386	25.9
6-10	180	19.1	173	31.5	353	23.7
11-15	165	17.5	145	26.4	310	20.8
16-20	126	13.4	28	5.1	154	10.3
21+	281	29.8	8	1.5	289	19.4

Source: Authors' tabulations of 2001 FAB survey data.

Note: Response rates to demographic questions varied slightly by question; above table includes only those who responded to each question.

**Table 2**  
**Homes, Mortgages, Insurance, and DB Plans**

Characteristic	Working		Retired		Total	
	Households		Households			
	(n)	(%)	(n)	(%)	(n)	(%)
Home ownership						
Rents	144	14.0	58	8.4	202	11.8
Owns	885	86.0	631	91.6	1,516	88.2
Mortgage status (owns)						
Has mortgage	726	82.0	244	38.7	970	64.0
Retiree health ins.						
Has retiree HI	538	51.2	400	55.9	938	53.1
LTC insurance						
Res. has LTC insurance	167	15.7	232	32.1	399	22.4
Sps. has LTC insurance	82	12.0	135	29.3	217	19.0
DB plans						
Res. has DB plan	253	24.4	221	32.6	474	27.7
Sps. has DB plan	177	17.1	132	19.5	309	18.0

Source: Authors' tabulations of 2000 and 2001 survey data.

**Table 3**  
**Wealth Aggregates for Surveyed Households**

Sample and measure	Mean	SD	Percentiles		
			10th	50th	90th
	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
<b>Working households</b>					
Earnings	87	67	30	73	150
Total assets	809	1,261	83	436	1,821
Total real estate assets	239	342	0	160	500
Total financial assets	587	1,036	38	273	1,453
Total ret. fin. assets	216	673	3	44	523
Total non-ret. fin. assets	406	683	21	192	1,035
Total debt	85	115	0	60	198
Total mortgage debt	74	93	0	50	180
Total personal debt	9	54	0	0	21
Total net worth	737	1,220	48	368	1,761
<b>Retired households</b>					
Total assets	1,092	954	241	812	2,213
Total real estate assets	276	648	30	180	500
Total financial assets	824	784	126	568	1,796
Total ret. fin. assets	357	625	6	149	892
Total non-ret. fin. assets	465	482	47	310	1,145
Total debt	40	335	0	0	92
Total mortgage debt	35	321	0	0	80
Total personal debt	4	29	0	0	5
Total net worth	1,066	956	216	792	2,244

Source: Authors' tabulation of 2000 and 2001 survey data.

Notes: Earnings is the reported level of household taxable income from employment in the calendar year 1999. "Total financial assets" is the sum of all retirement account balances, mutual funds (except real estate mutual funds), directly held stocks, directly held bonds, checking accounts, savings accounts, and CDs. "Total assets" is total financial assets plus the value of homes and other real estate. "Total net worth" is total assets minus mortgage debt, outstanding educational loans, outstanding personal loans, and credit card balances. All aggregates exclude the value of real estate mutual funds, whole life insurance policies, trusts, and educational savings accounts (Education IRAs and 529 plans). All wealth data are as of December 31, 1999.

**Table 4**  
**Spending Expectations among the Working**

Sample and expectation	Fraction (%)	Mean (% $\Delta c$ )	Std. Dev. (% $\Delta c$ )
All respondents (n=1,003)			
Expects same	35.3	0	0
Expects lower	54.6	-25.0	16.3
Expects higher	10.0	25.1	22.6
Total	100.0	-11.3	21.8
Regression sample (n=327)			
Expects same	38.6	0	0
Expects lower	53.3	-24.4	14.5
Expects higher	8.2	20.9	9.7
Total	100.0	-12.2	19.7

Source: Authors' calculations based on 2001 survey data.

Note: Respondents were asked to provide data on the expected percentage change in spending at retirement. 40 respondents indicated anticipated declines in spending of 80% or more, these reports are not included in the means and standard deviations above (see text) and are not included in the regression sample. We used the probability of response to the second part of the consumption question to adjust the mean and variance of the percent change in consumption (see text).

**Table 5**  
**Ordered Probit Expectation Regression Results**

Variable	Wealth = Net Non-Pension Assets		Wealth = Net Non- Pension Financial Assets	
	Coeff.	S.E.	Coeff.	S.E.
Non-Pension Wealth/100	0.023**	0.009	0.024***	0.008
DC assets/100	0.019	0.016	0.021	0.015
Debt	-0.002**	0.001	-0.002**	0.001
Income	0.002*	0.001	0.002*	0.001
Years to retirement	-0.022	0.018	-0.022	0.017
Male dummy	0.048	0.154	0.045	0.154
Never married	0.096	0.234	0.098	0.233
Previously married	0.537**	0.237	0.529**	0.237
Number of children	-0.050	0.085	-0.052	0.085
Age	-0.020	0.015	-0.018	0.015
College or below	0.292	0.191	0.296	0.191
Ph.D.	-0.063	0.170	-0.064	0.170
Faculty member	0.325*	0.170	0.330*	0.169
Home owner	0.080	0.265	0.082	0.267
DB pension	-0.513***	0.179	-0.506***	0.178
Sps. DB pension	0.028	0.233	0.040	0.233
Has retiree H.I.	-0.054	0.147	-0.055	0.147
Has LTC plan	0.274	0.244	0.273	0.245
Sps. Has LTC plan	-0.179	0.328	-0.159	0.326

Source: Authors' calculations based on 2000 & 2001 survey data.

Note: There are 307 observations in the regressions. Dependent variable is an indicator of the expected percent change in spending at retirement: equal to one if the change is positive, minus one if negative, and zero if no change. Observations weighted by 1 over the probability of response to the second part of the consumption question. Standard errors are Huber/White estimates. Asterisks indicate the level of statistical confidence for rejection of the hypothesis that the relevant coefficient is (independently) equal to zero: “\*\*\*” indicates rejection at better than a 1% level of confidence, “\*\*” indicates rejection at better than a 5% level, and “\*” indicates rejection at better than a 10% level.

**Table 6**  
**Basic OLS Expectation Regression Results**

Variable	Wealth = Net Non-Pension Assets		Wealth = Net Non- Pension Financial Assets	
	Coeff.	S.E.	Coeff.	S.E.
Non-Pension Wealth/100	0.283***	0.076	0.378***	0.098
DC assets/100	0.533**	0.265	0.510*	0.267
Debt	-0.021**	0.010	-0.018*	0.011
Income	0.012	0.021	0.013	0.021
Years to retirement	-0.025	0.322	-0.016	0.322
Male dummy	-1.064	2.746	-1.138	2.751
Never married	-0.660	3.648	-0.573	3.661
Previously married	5.518	4.647	5.448	4.658
Number of children	-0.184	1.417	-0.207	1.421
Age	-0.174*	0.262	-0.149	0.261
College or below	4.346	2.880	4.394	2.885
Ph.D.	-0.947	2.967	-1.009	2.972
Faculty member	6.284**	2.983	6.368*	2.989
Home owner	-1.783	4.212	-1.752	4.241
DB pension	-2.268	2.283	-2.191	2.293
Sps. DB pension	1.427	2.784	1.522	2.721
Has retiree H.I.	0.207	2.367	0.169	2.367
Has LTC plan	4.193	4.126	4.380	4.187
Sps. Has LTC plan	-2.846	4.838	-2.657	4.895
Constant	-6.969	16.717	-8.353	16.678

Source: Authors' calculations based on 2000 & 2001 survey data.

Note: There are 307 observations in the regressions. Dependent variable is the expected percent change in spending at retirement. Observations weighted by 1 over the probability of response to the second part of the consumption question. Standard errors are Huber/White estimates. Asterisks indicate the level of statistical confidence for rejection of the hypothesis that the relevant coefficient is (independently) equal to zero: “\*\*\*” indicates rejection at better than a 1% level of confidence, “\*\*” indicates rejection at better than a 5% level, and “\*” indicates rejection at better than a 10% level.

**Table 7**  
**Spending experience among the retired**

Sample and experience	Fraction (%)	Mean ( $\Delta \ln c$ )	Std. Dev. ( $\Delta \ln c$ )
All respondents (n=661)			
Experienced same	43.9	0	0
Experienced lower	36.2	-25.2	15.9
Experienced higher	20.0	22.3	15.3
Total	100.0	-4.6	21.1
Retired less than 10 years (n=277)			
Experienced same	45.9	0	0
Experienced lower	36.8	-25.0	15.6
Experienced higher	17.3	21.6	14.7
Total	100.0	-4.7	19.4
Retired at age 62 or 65 (n=93)			
Experienced same	49.5	0	0
Experienced lower	32.3	-23.4	13.7
Experienced higher	18.3	19.4	9.5
Total	100.0	-2.3	17.0

Source: Authors' calculations based on 2001 survey data.

**Table 8**  
**Regression Results for All Households,**  
**Controlling for Stock Market Exposure**

Variable	Coeff.	Std. Err.	Pr >  t
Retired	0.1762	0.1576	0.264
Retired	-2.4365	6.4544	0.706
Net worth	0.0021***	0.0007	0.005
(Net worth)*r	0.0004	0.0003	0.123
Equity share	-0.0405	0.0585	0.489
(Equity share)*r	0.3022***	0.1118	0.007
Year to/from ret.	-0.2317	0.3209	0.471
Male	-1.6973	2.4423	0.488
Prev. married	0.3257	2.8418	0.909
Nev. Married	4.3857	3.6792	0.234
Num. children	-0.1645	1.6150	0.919
Age	-0.1209	0.2319	0.602
Coll. or below	3.2062	2.4589	0.193
Prof. degree	-0.0624	2.6744	0.981
Faculty	7.5567***	2.5226	0.003
Owns home	-3.6456	4.2560	0.392
R. DB plan	-3.6859*	1.9813	0.064
S. DB plan	3.9901	2.5434	0.118
Ret. HI ins.	1.2753	2.1615	0.556
R. LTC ins.	2.9362	3.3957	0.388
S. LTC ins	-1.6911	4.4180	0.702
Constant	-5.6846	16.4769	0.730

Source: Authors' tabulation of 2001 survey data.

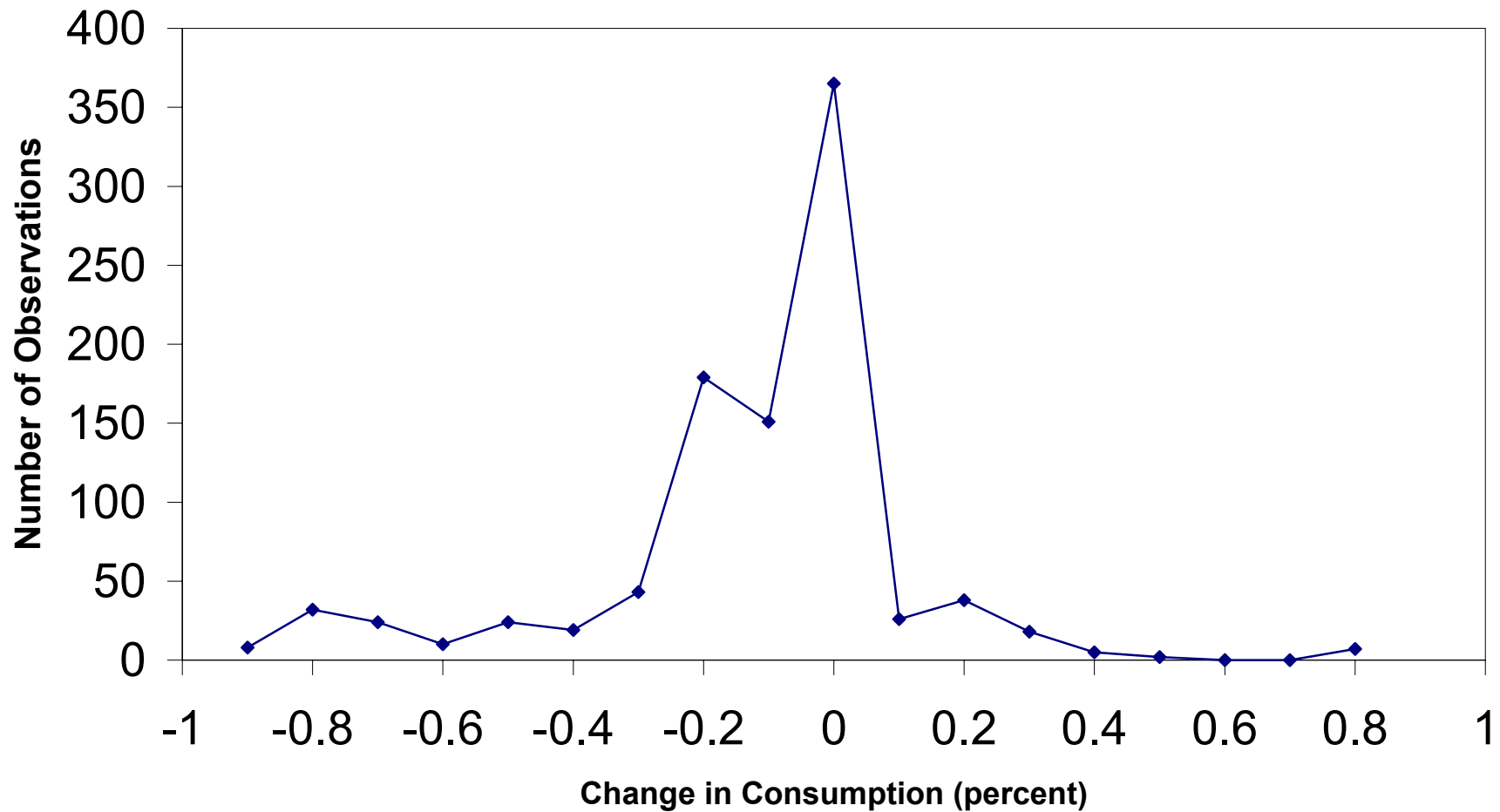
Notes: The dependent variable is our measure of the expected (for working households) or realized (for retired households) change in consumption in percentage points. Standard errors are Huber/White estimates. There were 400 observations used in this regression. The  $R^2$  was 0.1724 and  $F(20, 379)$  was 4.20. A test of the joint significance of the retired dummy and the net worth/retired interaction variable has an  $F(2, 379)$  of 1.20 (p-value of .3030).

**Table 9**  
**Actual spending in retirement relative to**  
**prior expectations, among retired**  
**households**

Spending level	All responses (%, n=694)
As expected	74.9
Higher than expected	15.3
Lower than expected	9.8

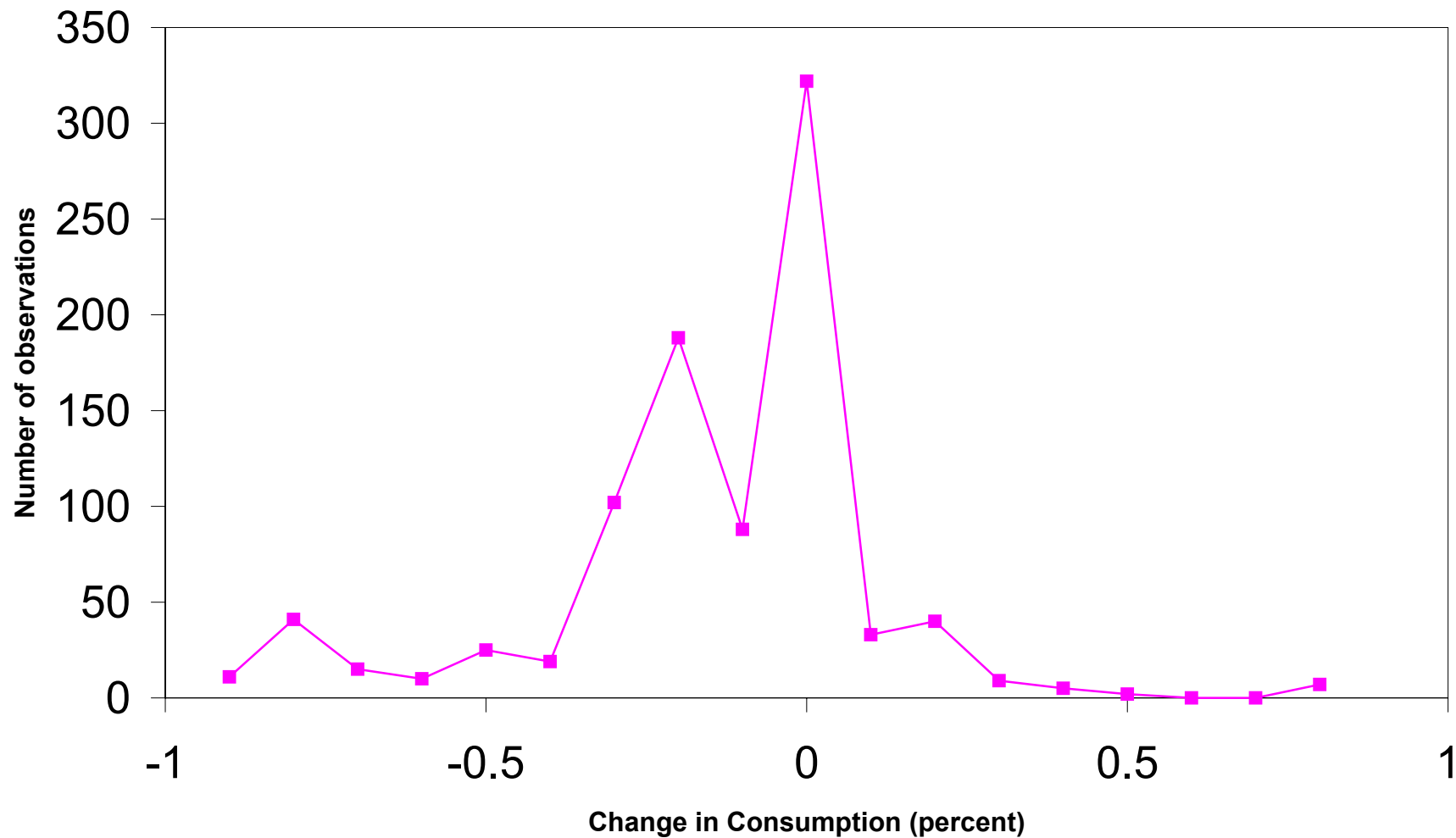
Source: Authors' tabulation of 2001 survey data.

**Figure 1: Distribution of Expected Changes in Consumption at Retirement among Working Households**



Note: Authors calculations based on 2001 survey data. Observations were grouped into cells of size ten (i.e. .6 refers to the range (.5-.6])

**Figure 2: Distribution of Realized Changes in Consumption at Retirement among the Retired**



Note: Authors calculations based on 2001 survey data. Observations were grouped into cells of size ten (i.e. .6 refers to the range (.5-.6])