# Household Propensities to Plan for Retirement: A Life Cycle Analysis

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## Introduction

It is well documented that, conditional on lifetime income, wealth varies dramatically across households entering retirement (Gustman and Juster, 1996; Smith, 1997; Hurst, Luoh and Stafford, 1998; Venti and Wise, 1998 and 2000; Lusardi, 2002). While many authors have attempted to explain this fact (Venti and Wise, 2000; Bernheim, Skinner and Weinberg, 2001; Hurd and Zissimpopoulos, 2002), the approach taken in this paper is quite different. In this paper, I directly examine the relationship between households' pre-retirement wealth and their consumption behavior while young. I find that households who entered retirement with much lower than predicted wealth did not follow permanent income consumption rules during their working years; their year-to-year consumption growth responded strongly to predictable income changes. No such behavior was evident in the other group of pre-retired households who had higher wealth conditional on observables. After ruling out other theories of consumption, including the existence of binding liquidity constraints, I conclude that those households who are most likely to under-save for retirement do so, at least in part, because they follow myopic consumption rules during their working years.[1]

In the first part of the paper, I segment 50-65 year old households in the 1989 Wave of the Panel Study of Income Dynamics (PSID) by residuals from a regression of observed household wealth on a vector of current and historical income, employment, demographic and health controls. Doing so, allows me to isolate households with similar opportunities to save. I classify households within the bottom twenty percent of residuals from this first stage regression as having 'lower than normal' wealth. By construction, households with lower than normal pre-retired wealth are very similar to other pre-retired households along income, health, employment, pension and demographic characteristics. However, these households with low pre-retirement wealth residuals experienced a much larger consumption decline upon their subsequent retirement compared to their higher wealth counter parts. The dramatic decline in consumption at retirement for households with lower-than-normal wealth is consistent with the hypothesis that these households were ill-prepared for retirement.

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[1] The work here is only a subset of results generated from this research project. For more details on the complete findings and a fuller description of the methodology used, see Hurst (2005).

After segmenting households entering retirement, I use the panel dimension of the *PSID* to analyze the consumption behavior of these households during their working years. I then test whether households who appear to violate the Permanent Income Hypothesis (PIH) by accumulating too little wealth to sustain consumption in retirement also violate the PIH while young. Performing standard excess sensitivity tests, I am able to reject that households with lower than normal pre-retired wealth behave as standard permanent income consumers while young. I find that the consumption growth of households with lower than normal pre-retirement savings responds strongly to predictable income changes. The consumption of other pre-retired households does not respond significantly to predictable income changes. Those households entering retirement with little wealth relative to their income, health and demographic trajectories appear to be following rule of thumb consumption plans during their working years.

This paper provides a set of facts that describe at least two different types of households. Most households in the population behave according to the Permanent Income Hypothesis. However, there is a segment of households who enter retirement with very low wealth even after controlling for differences in income, demographic, employment and health histories. These same households experience a large consumption decline at the onset of retirement, relative to other pre-retired households. Additionally, these households have consumption profiles that respond to predictable income shocks throughout their working years. Many alternative theories can explain a subset of the above behaviors, but very few theories can jointly explain them all. Specifically, it is shown that the behaviors of these low wealth, pre-retired households are inconsistent with consumption theories such as precautionary savings (Deaton, 1992; Carroll, 1997) or habit formation (Deaton, 1992). These behaviors, however, are consistent with either rule-of-thumb consumption (Campbell and Mankiw, 1989) or hyperbolic consumers (Laibson, 1997). In either case, the households display a lack of planning behavior; under the former theory, the households are myopic and do not attempt to plan for the future, while under the latter theory, the households attempt to plan, but are incapable of committing themselves to carry out those plans.

As supporting evidence that differences in planning propensities are driving the differences in behavior between the two groups, I find that these households with low

wealth entering retirement, conditioned on lifecycle factors, were aware of their near-sighted behavior nearly two decades prior to their retirement. In 1972, questions were asked of all PSID respondents about 1) their propensity to plan for the future, 2) carry out their plans for the future and 3) their propensity to spend their income rather than save it. The answers to such questions are definitely noisy measures of household behavior. However, households who entered retirement with lower than normal savings were much less likely to report that they plan for the future, were much less likely to report that they carry out their plans and were much more likely to report that they spend their income rather than save it.

**Segmenting Pre-Retired Households By Wealth Residuals**

The purpose of this section is to identify pre-retired households with lower than 'normal' wealth. Household wealth, at the time of retirement, is a function of economic factors (income, demographics, health shocks, interest rates) and individual decision factors (saving propensities, portfolio allocation). In order to explore household planning behavior, households who had similar opportunities to save over their lifetime are compared. A cross section of pre-retired households who were in the *PSID* during the 1989 survey were examined. Pre-retired households are defined to be households with a non-retired head between the age of 50 and 65. Given the sample design of the *PSID*, nearly all 1989 pre-retired households had one family member participate in the *PSID* every year since the survey's inception in 1968. As a result, there are almost twenty years of income, employment, demographics and health data for each pre-retired household in the 1989 PSID. The measure of wealth used in this paper includes all assets measure within the PSID less all liabilities (see Hurst (2005) for a full discussion).

To identify households who saved little given their economic opportunities, the following regression was estimated:

$$W_{i,1989} = f_0 + f_1 X_{i,,1989} + f_2 Z_{i,historical} + ?_{i,1989}, \qquad (1)$$

where $W_{i,1989}$ is the log of household *i*'s net wealth in 1989, $X_{i,\,1989}$ is a vector of household *i*'s 1989 income, employment, demographic, and health controls, and $Z_{i,historicial}$ is a vector of household *i*'s historical income, employment, demographic and health

controls. The error term, $?_{i,1989}$, represents the portion of current household log wealth that is unexplained by the *X* and *Z* controls.

$X_{i,1989}$ includes the current age of the household head, age squared, dummies for the household head's race, marital status, educational attainment, occupation, industry and family composition, a quadratic in household current total labor income, dummies for the household head and "wife's" current health and employment status, and the household's self reported expectation of their pension replacement rate. $Z_{i,historical}$ includes a quadratic in average household labor income between 1980 and 1987, a quadratic in average household labor income between 1974 and 1979, the change in labor income between 1980 and 1988, the coefficient of variation of income over 1975 and 1989, and health and unemployment shocks experienced by the head and the wife between 1980 and 1988. In some specifications, health and unemployment shocks experienced by the household in the 1970s were included. These variables provided no additional explanatory power to the regression and, as a result, were omitted from the base specification.

The residuals from (1), $?_{i,1989}$, provide a measure of whether the household has saved more or less than households with similar economic, demographic, employment, and health trajectories. The adjusted R-squared from (1) was 0.53 indicating that the controls included captured a majority of the variation in wealth across households. Any classification of households into two groups based on these wealth residuals is in some sense arbitrary. To begin, I segment households with the lowest 20% of residuals as having low "normalized" wealth. My comparison group will be all other pre-retired households in the sample. As a robustness specification, I will examine other cutoffs.

Table 1 presents descriptive statistics for the two samples of pre-retired households where the sample is split based on the first stage wealth residuals estimated from (1). Aside from wealth, the two samples look very similar along income, demographic and health histories. Given the sample selection procedure, this result should not be surprising.

If differences in planning ability across households were driving the difference in normalized pre-retirement wealth across households, we would expect to see subsequent differences in retirement behavior. Households who accumulated too little wealth for

retirement should react to the realization that they were ill prepared by: 1) reducing their consumption in retirement and/or 2) delaying the time of their retirement (or working a part time job after retiring).

The only measure of consumption, aside from housing expenditures, that the *PSID* directly asks its respondents about is their food consumption. Specifically, in all years between 1970 and 1987 and all survey years between 1990 and 1999, households were asked to report the amount that that they spent on food at home and food away from home during the previous month. Consistent with the hypothesis that our group of low residual households are ill prepared for retirement, it is found that such households have much larger declines in consumption upon retirement. The average decline in consumption for the low wealth residuals households was 11%, while the other group, on average, only decreased their consumption during retirement by 3%. The median decline in consumption at retirement showed a similar pattern: low wealth pre-retired households experienced nearly a 20% consumption decline compared to a 11% decline for the other households. Moreover, the low wealth households were found to be more likely to take a part time job in retirement.

**Testing For Differences in PIH Behavior Across Wealth Residual Groups**

The large decline in consumption at retirement for low wealth households seems at odds with the standard permanent income hypothesis (PIH) model (Modigliani and Brumberg, 1954; Friedman, 1957).[2] Given that the date of retirement is largely forecastable, forward looking households should accumulate enough wealth so as to sustain consumption during retirement. In this section, I explicitly test whether the low wealth residual households behaved as permanent income consumers in the decades prior to retirement. In other words, do low wealth pre-retired households seem to violate the PIH throughout their lives or only at the time of retirement?

According to the PIH with perfect capital markets and patient consumers, expected income growth between period $t$ and $t+1$ should not have statistical power in predicting consumption growth between period $t$ and $t+1$ (Hall 1978). Any predictable

[2] If consumption and leisure are substitutes, the PIH model could predict a large consumption decline at retirement. This proposition is tested in Section V.

future changes in the household's income stream should already be incorporated into the household's current consumption plan.

In Hurst (2005), I derive the following consumption Euler equation to the standard optimization of the household problem with constant elasticity of substitution utility function, preferences that evolve with age and family structure, and standard income shocks. The following formulation is identical to that found in Zeldes (1989):

$$\dot{C}_{ik,t+1} = l_{0k} + l_{1k}\ln(1+r_{ik,t+1}) + l_{2k}\ \dot{famsize}_{ik,t+1} + l_{3k}age_{ikt} + m_{t+1} - m_t + e^*_{ik,t+1} \quad (2)$$

where $i$ indexes households, $k$ indexes household type (i.e., whether or not the household belongs to the low pre-retirement wealth residual group) and $t$ indexes time, and C is household consumption, $\dot{C}_{ik,t+1} = \Delta \ln C_{ik,t+1}$, $r_{ik,t+1}$ is the after tax real interest rate of household $i$ between $t$ and $t+1$, $age_{ikt}$ is the age of the household head in year $t$ and $famsize_{it}$ represents the number of members in the household in year $t$, and $e^*_{ik,t+1}$ is mean zero. The effects of interest rates, age and family size on consumption growth are allowed to differ by household type, $k$

Our goal is to test whether the consumption rules of the two different groups are similar. As a result, (2) will be jointly estimated for the two different sub-populations of households - those with low first stage pre-retired wealth residuals and all other households. Formally, the following equation allows for the parameters of (2) to differ accordingly between the two groups of households:

$$\begin{aligned}\dot{C}_{ik,t+1} = a_0 + a_1 D_{<20} + a_2\ln(1+r_{ik,t+1}) + a_3 D_{<20}\ln(1+r_{ik,t+1}) + a_4\ \dot{famsize}_{ik,t+1} \\ + a_5 D_{<20}\ \dot{famsize}_{ik,t+1} + a_6 age_{ikt} + a_7 D_{<20} age_{ikt} + j\ D_{Year} + e^*_{ik,t+1}\end{aligned} \quad (3)$$

where $D_{<20}$ is a dummy variable equal to 1 if the household has a first stage wealth residual (defined in the previous section) in the lowest twenty percent of the wealth residual distribution. $D_{Year}$ is a vector of year dummies which are included to account for aggregate shocks which affect both types of households.

To test whether household consumption responds to predictable changes in income, the following regression can be estimated:

$$\dot{C}_{ik,t+1} = a_0 + a_1 D_{<20} + a_2 \ln(1+r_{ik,t+1}) + a_3 D_{<20} \ln(1+r_{ik,t+1}) + a_4 \dot{famsize}_{ik,t+1}$$
$$+ a_5 D_{<20} \dot{famsize}_{ik,t+1} + a_6 age_{ikt} + a_7 D_{<20} age_{ikt} + j\, D_{Year} + b_1 \dot{Y}^{Predict}_{ik,t+1} + b_2 D_{<20} \dot{Y}^{Predict}_{ik,t+1} + e^*_{ik,t+1} \quad (4)$$

where $\dot{Y}^{Predict}_{ik,t+1}$ is the predictable component of income growth rate between *t* and *t+1* estimated simultaneously with (4).[3] If households are not sufficiently 'impatient', the Permanent Income Hypothesis predicts that consumption growth between periods *t* and *t+1* should be unaffected by forecastable changes in income between periods *t* and *t+1*.[4] Any predictable change in income should already be included in the household's consumption plan. If either $ß_1$ or $ß_2$ is positive and significant, predictable income growth has statistical power in predicting consumption growth and the standard Permanent Income Hypothesis with no liquidity constraints and patient consumers can be rejected.

In order for the two stage least squares estimation of (4) to yield unbiased estimates of $ß_1$ and $ß_2$, both the predictable income growth components and the dummy indicating the bottom 20% of the pre-retirement wealth distribution have to be independent of the regression error term. In the following empirical work, I will instrument for a household's predictable component of income growth using four lags of income growth, excluding the first lag.[5] By definition, these lagged variables are orthogonal to the error term, $e^*_{i,t+1}$.

Equation (4) is estimated on data from 1975–1987 for the sample of *PSID* households who were 'pre-retired' in 1989. Formally, consumption growth is defined as the change in log annual food expenditures between year *t* and year *t+1*. See the Data Appendix for a full discussion of the creation of household real consumption growth and household real after-tax interest rates.

When estimating (4), I instrument for the predictable component of household labor income growth using 4 lags of household labor income growth, excluding the first

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[3] This procedure to test for the excess sensitivity of consumption is standard in the literature. See Browning and Lusardi (1996) and the cites within.

[4] 'Impatient' households are classified as households who wish to borrow, all else equal, in the current period. This impatience condition is necessary to generate buffer stock saving behavior (Carroll, 1997). Below, I rule out buffer stock saving behavior as an explanation for the results presented in this and previous sections.

[5] The first stage regression showing the validity of the instruments is discussed in the following section.

lag. If household labor income growth follows an autoregressive or moving average process, past labor income growth will have predictive power in determining expected future labor income growth. As noted above, I allow the income processes to differ accordingly between the two different groups of pre-retired households. A first stage regression of current household labor income growth on four lags of household labor income growth shows that the lags have strong predictive power both for households who have wealth residuals in the top 80% ($F$-statistic = 10.7, $p$-value < 0.01) and for households who have 1989 wealth residuals in the bottom 20% ($F$-statistic = 4.2, $p$-value < 0.01).

Table 2 shows the results from estimating equation (4). If both the low residual and high residual groups followed standard PIH consumption rules, then both $ß_1$ and $ß_2$ would equal zero. If the low residual wealth groups followed a similar consumption plan as the high wealth residual group, $ß_2$ would equal zero, regardless of the value of $ß_1$. Table 2 reports that $ß_1$, the coefficient on the predictable change in income for the whole sample, is negative and not statistically different from zero. $ß_2$, however, is large, positive, and statistically different from zero. Households who had little pre-retirement wealth relative to their lifecycle characteristics responded positively to predictable income changes. The model predicts that the marginal propensity to consume out of predictable income changes is 56 percentage points higher for households with lower than normal pre-retirement wealth ($t$-statistic = 2.0). The net response to predictable income changes for the low residual group ($ß_1 + ß_2$) is positive (an estimated marginal propensity to consume of 0.40) and statistically different from zero ($p$-value 0.06).

In summary, the results of this section show that households who display behavior that is inconsistent with the permanent income hypothesis as they transition into retirement also display behavior that is inconsistent with the permanent income hypothesis during their working lives.

**Robustness Specifications**

The results in section III suggest that pre-retired households residing in the lowest twenty percent of the normalized wealth distribution have different consumption behavior during their working years than other households with similar economic histories. Is the

difference in consumption behavior due to liquidity constraints? How sensitive are the results to the choice of a 20% wealth residual cutoff? Are the findings in section III robust to changes in the sample selection criteria? In this section, all of these questions are explored.

If market imperfections prevent households from borrowing when expected income growth is positive, predictable income growth will have statistical power in predicting consumption growth. The lower the household wealth, the more likely the household will be liquidity constrained. However, as noted by Altonji and Siow (1987), Zeldes (1989) and Shea (1995), it is possible to empirically test whether the existence of liquidity constraints is driving the rejection of the Permanent Income Hypothesis in micro data. Liquidity constraints prevent a household from borrowing but do not place any restrictions on a household's ability to save. As a result, the consumption growth of liquidity constrained households should only respond to predictable *increases* in income, but not predictable income *declines*. If households truly expect their income to decline, they could save a percentage of their income today so as to fund consumption in the future, leaving their discounted marginal utility of consumption unchanged. I find that the low residual households respond equally to predictable income increases and to predictable income declines. Such a result suggests that liquidity constraints are not driving the rejection of the permanent income hypothesis.

This should not be surprising. By definition, the two groups of households had earned similar levels of labor income over their lives. If one group was liquidity constrained while young, their consumption over that time period should have been lower, all else equal. This implies that liquidity constrained households will show up in retirement with higher wealth, not lower wealth. The fact that a household has low normalized wealth at retirement suggests against liquidity constraints while young.

In Hurst (2005), a series of additional robustness specifications were explored. In particular, I showed that the twenty percentile of the wealth residual distribution is a well justified cutoff to separate households who are perpetually poor planners from the rest of the population. I concluded that somewhere between 10-20% of the pre-retired wealth distribution have lower than normal pre-retirement wealth and have consumption profiles that respond to predictable changes in income.

**The Self-Awareness of Economic Grasshoppers**

There is one final piece of evidence that suggests pre-retired households in 1989 who had lower than normal wealth did so because of poor planning. In 1972 and 1975, the *PSID* asked its respondents to self assess many of their socio-economic characteristics. Some of the questions asked of *PSID* respondents included: whether they get angry easily, whether they are concerned about failure, whether they feel life will work out, whether they have control over life, and whether they are satisfied with themselves. There were three questions asked as part of these supplements that directly pertained to a household's consumption-savings tradeoff and the household's willingness to plan for the future. Specifically, the questions were: 1) Are you the kind of person that plans his life ahead all the time or do you live more from day-to-day? 2) When you make plans ahead, do you usually carry out things the way you expected? and 3) Would you rather spend your money and enjoy life today or save more for the future?

The first question was asked in both 1972 and 1975, while the second and third questions were only asked in 1972. The questions above are inherently vague about what they were intended to measure. I do not want to claim that the answers to such questions are in any way indicative of the household's actual behavior. I do, however, believe that the answers to such questions may provide some suggestive evidence about how the two groups of pre-retired households studied above assess their own behavior.

As noted earlier, most of the pre-retired *PSID* households in 1989 were in the *PSID* since its inception in 1968 and, as a result, provided answers to the self-assessment questions in both 1972 and 1975. The results are reported in Table 3. Responses were compared between households with low normalized pre-retirement wealth residuals (bottom 20%) and all other households. The sample split is identical to the one described in Table 1. As expected, households with lower than normal pre-retirement wealth were much less likely to classify themselves as planners in 1972 (46% for the low wealth residual households vs. 59% for the higher wealth residuals, *p*-value of difference = 0.06). The results are even more striking in 1975. Households with lower than normal pre-retirement wealth in 1989 only reported themselves to be a planner 38% of the time (compared to 56% of the time for the other 1989 pre-retired households). In 1972, only

54% of the low wealth residual households said that they were likely to carry out plans as expected. The other pre-retired households in 1989 said that they carried out their plans 67% of the time. All these differences were significant at the ninety-four percent level of confidence.

Perhaps the most interesting question is the one that most directly assesses the household's consumptions decisions. Of the households with the lowest 1989 pre-retirement wealth residuals, 60% of them reported in 1972 preferring spending money today (as opposed to saving it for the future). The comparable number for the other 1989 pre-retired households was only 40%. While only suggestive, it appears that those households who do not plan accordingly are aware of their tendencies. Such households report being less likely to plan for their future, less likely to carry out plans conditional on making them, and more likely to spend their money today rather than save it for the future. One should not forget that these self-assessments were made almost two decades prior to when their pre-retirement wealth was measured.

There are two other questions in the early *PSID* surveys that are worth reporting. The first question asked households whether or not they had any positive savings. The second asked if the household had accumulated savings greater than two months of income. These questions were asked both in 1972 and 1975. The responses to these questions for our 1989 pre-retired households are also reported in Table 3. Not surprisingly, households who under-saved entering retirement were low savers throughout their early working years. For example, in 1972, only 30% of those pre-retired households with wealth residuals in the bottom twenty percent of the wealth distribution had two months worth of accumulated savings. Over ½ of the other pre-retired households had at least two months of accumulated savings. Households who have lower than normal wealth entering retirement were much less likely to have had any significant amount of saving early in their lifecycle.

**Discussion and Conclusions**

The results above show that there is a link between household retirement wealth and their consumption while young. Specifically, a set of facts are presented which describe two different types of households. First, there is a segment of households who

enter retirement with very low wealth even after controlling for differences in income, demographic, employment and health histories. Second, these same households experience a large consumption decline at the onset of retirement, relative to other pre-retired households. Third, these households have consumption profiles that respond to predictable income shocks throughout their working years. Differences in observables do not explain differences between these groups. These households, by construction, are nearly identical along income, employment, demographic, and health dimensions. While it is found that a majority of households behave as predicted by the standard permanent income hypothesis, a subset of households (roughly 10-20% of the population) have consumption and saving behavior that is inconsistent with such a theory. The goal, then, is to explain the behavior of this latter group of households.

Many alternative theories can explain a subset of the above facts, but very few theories can jointly explain them all. For example, the results described above for low wealth residual households are inconsistent with models of consumption habits or precautionary savings. While both of those theories could predict excess sensitivity in consumption to predictable income changes during a households working years, neither would predict such a sharp decline in consumption upon retirement. To the contrary, standard models of consumption habits (Deaton, 1992) predict that consumption will decline less slowly during retirement for those households with habit preferences, compared to PIH households, all else equal.

Precautionary models of saving may predict low pre-retirement savings along with the excess sensitivity of consumption, but such households would still smooth their consumption across the period of retirement (Gourichas and Parker, 2000). Also, differences in time preferences across households cannot alone generate the above findings. It is true that households with a high, constant time discount rate will enter retirement with little wealth, relative to households with similar income profiles and a lower time discount rate. However, such household will still smooth the marginal utility of consumption over time. These households will have consumption profiles that would not respond to predictable income changes, including retirement.

A strong substitutability between leisure and consumption could reconcile the main results outlined above. Leisure is high in both retirement and periods of job loss.

Households who treat consumption and leisure as substitutes would optimally plan for lower consumption in retirement and, as a result, would save less during their working years. Furthermore, as the household became retired, and leisure increased, we would expect a sharp decline in consumption if the household was smoothing total utility and not just consumption. Lastly, these households would optimally choose to have a positive correlation between predictable income movements and consumption while young, if the predictable income changes were associated with a change in leisure (such as job loss). When leisure is low, consumption would be high and when leisure is high, consumption would be low. To explore whether the substitutability between leisure and consumption is causing the failure of the permanent income tests, changes in total hours worked by both the household head and wife (if present) were included directly into the estimation of regressions (4) and (5). This procedure is similar to that used by Attanasio and Browning (1995) to test for the substitutability of consumption and leisure. The results reported in Tables 2 and 3 were essentially unchanged with the inclusion of work hours into the estimation equation. Such a finding suggests that the substitutability between consumption and leisure is not causing the failure of the permanent income hypothesis documented above.

There are two possible types of behavior that are consistent with all of the results above. First, households who follow myopic (rule-of-thumb) consumption rules would have consumption that closely tracks income (Campbell and Mankiw, 1987). If households do not plan for the future they will end up in retirement with little wealth, be forced to take a consumption decline upon retirement, and will have consumption profiles that respond to predictable income changes during their working years. Second, a theory of time inconsistent preferences can match the above facts. Such households may want to plan for the future, but are incapable of doing so; these households have relatively high discount rates over short horizons and relatively low discount rates over longer horizons. This discount structure sets up a conflict between today's preferences (which prefer current consumption), and the preferences that will be held in the future (which prefer that they had deferred consumption in the past). A household may realize that retirement is coming, yet in each period the household would choose to postpone saving for retirement until the next period. Eventually, the household could enter retirement with

little accumulated wealth, and as a result, consumption would eventually have to decline. Furthermore, consumers with time inconsistent preferences could have consumption growth that responds to both predictable income increases and predictable income declines (Laibson, 1997).

While both the rule of thumb and the time inconsistent preference theories can reconcile the behavior of households with low wealth residuals, it is not possible to disentangle the two theories. Specifically, it is not possible to distinguish whether these identified household are completely myopic with respect to their consumption decisions or whether they would like to plan for the future, but are incapable of doing so. However, certain types of consumers with time inconsistent preferences can be ruled out. Laibson (1997) and Angelitos et. al. (2000) draw distinctions between 'sophisticated hyperbolic consumers' and 'naïve hyperbolic consumers'. The former group is aware of their time inconsistent preferences while the latter is not. Sophisticated hyperbolic consumers will take steps to commit themselves to saving. Such households, knowing their desire to reduce saving and increase consumption, will shift their savings toward illiquid assets (i.e., real estate, business or pension).

There is no evidence among the low pre-retirement wealth residual households to suggest that they are trying to commit themselves to save. Actually, the results suggest the opposite. Only 56% of the pre-retired, low wealth residual households (those in the bottom 20% of the wealth residual distribution) own any 'illiquid' assets, where liquid assets are defined as the sum of housing, other real estate and business equity. The comparable number for the other pre-retired households was over 90%. Furthermore, the median fraction of household wealth in these illiquid assets is much smaller for those households with low pre-retirement wealth residuals (0.23 vs. 0.66). If the households with low pre-retirement wealth residuals have time inconsistent preferences, they are not taking actions to commit themselves to save for the future.

In conclusion, there exists at least two different types of consumers in the population; those that plan for the future and those that do not plan for the future. In future work, it would be useful to understand whether such households simply do not plan for the future (are myopic) or do plan for the future, but are unable to commit themselves to save (have time inconsistent preferences).

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**Table 1: Descriptive Statistics for Two Sub Samples of Pre-Retired Households: Bottom 20% of 1989 Wealth Residuals and Top 80% of 1989 Wealth Residuals**

| *Selected Income and Demographic Variables* | *Top 80%* | *Bottom 20%* | p-*value of difference* |
|---|---|---|---|
| *Wealth Distribution and Portfolio Composition* | | | |
| 25th percentile of Household Wealth | $28,900 | $2,014 | <0.01 |
| Median Household Wealth | $83,150 | $8,275 | <0.01 |
| 75th percentile of Household Wealth | $205,500 | $29,954 | <0.01 |
| % Owning Home | 0.77 | 0.43 | <0.01 |
| % Owning Stocks | 0.31 | 0.12 | <0.01 |
| % Owning Business | 0.19 | 0.03 | <0.01 |
| *Demographics* | | | |
| Age of Head in 1989 | 57 | 57 | 0.30 |
| Dummy: Marital Status in 1989 | 0.68 | 0.58 | 0.02 |
| Dummy: Divorced Anytime 1980 – 1988 | 0.11 | 0.12 | 0.50 |
| Dummy: Race of Head in 1989 (Black = 1) | 0.10 | 0.13 | 0.35 |
| Dummy: Education in 1989 12 years or less | 0.48 | 0.55 | 0.22 |
| Dummy: Have Children Aged 1– 5 in 1989 | 0.03 | 0.01 | 0.09 |
| Dummy: Have Children Aged 6 – 13 in 1989 | 0.06 | 0.05 | 0.65 |
| Dummy: Have Children Aged 14 - 20 in 1989 | 0.20 | 0.20 | 0.91 |
| Number of People in Household | 2.4 | 2.2 | 0.25 |
| *Labor Income and Labor Income Variability* | | | |
| Mean Family Labor Income in 1989 | $39,947 | $39,790 | 0.98 |
| Mean Family Labor Income: 1980-1989 | $37,793 | $35,260 | 0.49 |
| Change in Family Labor Income: 1980-1989 | $4,349 | $6,949 | 0.62 |
| % Heads Unemployed in 1989 | 0.04 | 0.03 | 0.66 |
| % Heads Unemployed Anytime 1980-1988 | 0.21 | 0.23 | 0.60 |
| Med. Coefficient of Variation (Income) 75-89 | 0.51 | 0.53 | 0.21 |
| *Health Shocks* | | | |
| % With Head 'Bad Health' in 1989 | 0.19 | 0.25 | 0.10 |
| % With Head 'Bad Health' Anytime 1980-88 | 0.33 | 0.39 | 0.14 |
| % With Wife 'Bad Health' in 1989 | 0.11 | 0.09 | 0.52 |
| % With Wife 'Bad Health' Anytime 1980-88 | 0.22 | 0.24 | 0.68 |
| *Retirement Pension* | | | |
| % of 1989 Income Replaced During Retirement | 0.54 | 0.52 | 0.66 |

Notes: The sample was split using the residuals from a first stage regression of 1989 household log wealth on a vector of household observables. The sample included all non-retired households aged 50-65 in the 1989 wave of the PSID (819 households). All dollar values are in 1989 dollars.

**Table 2: Responsiveness of Early Life Consumption to Predictable Income Changes, Segmenting By 1989 Pre-Retired Wealth Residuals**

| Variable | Coefficient (Standard Error) |
|---|---|
| Predictable Income Growth, All Households ($ß_1$) | -0.16 |
| | (0.15) |
| Predictable Income Growth, Low Wealth Residual Households ($ß_2$) | 0.56 |
| | (0.28) |

Notes: This table reports the estimates of the response of household consumption growth to predictable income changes (equation (5) in text). $ß_1$ is the coefficient on predictable income changes for the full sample. $ß_2$ is the coefficient on predictable income changes for households with low first stage wealth residuals. All other estimated coefficients were suppressed. Households with low first stage wealth residuals are defined to be pre-retired households between the age of 50 and 65 who had wealth residuals in the bottom 20% of the wealth residual distribution. See footnote to Table 1 for additional details. Households for which their one year consumption growth was in excess of 50% or less than -33% were excluded from the sample. The household was only excluded from the sample for that given year. These sample restrictions left 4,668 observations, based on 727 households. Standard errors (in parentheses) were adjusted for within household heterogeneity. The equation was estimated using two-stage least squared where the predictable component of household labor income growth was instrumented for using four lags of household labor income growth (excluding the first lag). The income processes was estimated separately for low wealth residual and other wealth residual households.

**Table 3: Household Response to Historical Saving Questions and to Subjective Self-Assessment of Planning and Spending Behavior: By 1989 Wealth Residual Groups**

| 1972 and 1975 Saving and Subjective Self Assessment Questions. | *1st Stage Residual Top 80%* | *1st Stage Residual Bottom 20%* | p-*value of difference* |
|---|---|---|---|
| *1972 Variables* | | | |
| % of households who describe themselves as a planner.[a] | 0.59 | 0.46 | 0.06 |
| % of households who describe themselves as likely to "carrying out plans".[b] | 0.67 | 0.54 | 0.06 |
| % of households who describe themselves as being a spender.[c] | 0.41 | 0.60 | <0.01 |
| % of households in 1972 with any positive savings. | 0.80 | 0.66 | 0.02 |
| % of households in 1972 with accumulated savings > two months of income. | 0.52 | 0.30 | <0.01 |
| *1975 Variables* | | | |
| % of households who describe themselves as being a planner.[a] | 0.56 | 0.38 | 0.01 |
| % of households in 1975 with any positive savings. | 0.80 | 0.74 | 0.25 |
| % of households in 1975 with accumulated savings > two months of income. | 0.48 | 0.29 | <0.01 |
| Sample Size | 500 | 127 | |

[a] PSID question reads: "Are you the kind of person that plans his life ahead all the time or do you live more from day-to-day?"
[b] PSID question reads: "When you make plans ahead, do you usually carry out things the way you expected?"
[c] PSID question reads: "Would you rather spend your money and enjoy life today or save more for the future?"

Notes: All non-retired households between the age of 50 and 65 in the 1989 PSID who were in the sample during either 1972 or 1975 (627 households). Subjective self assessment questions were asked only in the 1972 and 1975 waves of the PSID. The 1972 set of questions were more extensive. As a result, the 'carry out plans" and the 'saver versus spender' questions were not asked in 1975. Household response to the question were on a 1-5 scale, with 5 being agree strongly with the statement and 1 being disagree strongly with the statement. Households are considered to respond positively to a question if they answered a 4 or a 5. Wealth residuals are defined as in Table 1.