

NBER WORKING PAPER SERIES

CONSUMPTION DURING RETIREMENT: THE MISSING
LINK IN THE LIFE CYCLE

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Working Paper No. 930

NATIONAL BUREAU OF ECONOMIC RESEARCH
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July 1982

Professor of Economics, Michigan State University and research associate, NBER. Research reported in this paper was supported by National Science Foundation grant DAR-8008458. Helpful comments on an earlier draft from participants at seminars at the NBER, Harvard, Michigan State, Oregon and Wisconsin, and discussion with Martin Feldstein and Paul Menchik aided in the work. The research reported here is part of the NBER's research program in Labor Studies. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

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ABSTRACT

This study presents the first evidence on the relation of consumption to lifetime wealth, based on data from the 1973 and 1975 Retirement History Survey that have been linked to Social Security earnings records. Nearly 500 white, married, fully retired couples ages 62-69 form the basis of the analysis. On average their consumption early in retirement exceeds by 14 percent the income that their financial, pension and Social Security wealth can generate. This implies that their saving, both private and through Social Security, is insufficient to sustain consumption throughout the rest of their lives. Additional evidence based on changes in spending between 1973 and 1975 shows that these households respond by reducing their real consumption at a rate sufficient to generate positive changes in net financial worth within a few years after retirement. These two pieces of evidence can be rationalized by a rate of time preference much higher than the interest rate, coupled with either a bequest motive or uncertainty about the length of life. They also imply that, even when combined with private pensions and savings, Social Security in the United States today does not enable most recipients to maintain their living standard at the levels they enjoyed before they retired.

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I. Introduction

An immense amount of recent empirical research has examined how wealth accumulation changes with age. The purpose of most of this work is to test the theory of life-cycle utility maximization in which consumption is the choice variable. Despite the focus of the theory on life-cycle consumption, though, empirical work using longitudinal data has been based exclusively on data on wealth and earnings. Cross-section data, on the other hand, have been used exclusively to examine the relation of consumption to income across age groups. Here I try to rectify this imbalance by considering longitudinal data on consumption and wealth late in the life cycle. By considering the issues from a different empirical perspective, this examination should enable us to sort out explanations for observed behavior in a way not possible in the work that had to infer consumption profiles from the data on assets, or that looked at "snapshots" of consumption-income relations.

Studying actual consumption among the elderly allows the direct estimation of how well Social Security retirement benefits meet one of the program's main goals--the maintenance of consumption (see Hamermesh, 1982a). While this largest of transfer programs has accreted a number of redistributive aspects (both within and across cohorts) over its life in most Western countries, its original stated purpose, at least in the United States, was to prevent economic hardship (reduced consumption, independent of a household's place in the distribution of lifetime income).^{1/} By examining the sources of income available to finance consumption in old age, we can, under alternative assumptions about what private saving would be in the absence of enforced saving for Social Security, discover whether Social Security benefits are sufficient to sustain consumption, and how much consumption

would have to be reduced without these transfers.

II. Life-Cycle Issues and Patterns in Consumption

In the presence of certainty about earnings trends and the length of life, no bequest motive, a fixed retirement date and perfect capital markets, the life cycle pattern of consumption depends solely on the relationship between the rate of interest (r) and the rate of time preference (ρ). To the extent that r exceeds (is less than) ρ consumption will be observed to increase (decrease) with age. The less perfect are capital markets, assuming the observed inverse J-shaped age-earnings profile, the more likely it is that consumption will increase with age, and the less likely that it will decrease monotonically with age from time zero. If $r < \rho$, we may observe consumption increasing with age until some point in the life cycle, though it decreases with age after that. Given the assumptions made here, savings will be positive up to some age at or before retirement, and consumption will exceed income and be on a trajectory that will exhaust wealth on the date of death. Wealth--all physical capital and financial wealth including the value of pensions--will decline with age during retirement.

Modifying this scenario to allow for planned bequests does not change the implications for the rate of change of consumption with age. This still depends on the possibilities for borrowing and the relation between time preference and the rate of interest. But the requirement that wealth be positive on the date of death does entail a lower level of consumption at each age during retirement. Thus the ratio of consumption to wealth or to an annuity out of wealth will be lower during retirement

the greater is the bequest motive; and the ratio will, if this motive exists, be low enough to imply positive net worth at the (certain) date of death.

Unfortunately, information on consumption during retirement does not allow us to distinguish between a bequest motive and risk averse behavior in the face of uncertainty about the date of death. Uncertainty about survival produces two opposite effects (Levhari-Mirman, 1977) -- increasing consumption to enjoy what one may not be around to enjoy later, decreasing consumption to provide for a horizon that may be quite distant. Whether the profile of consumption rises or falls during retirement depends, as in the standard case, on the relationship between time preference and the rate of interest, but also on whether the extent of uncertainty and/or the degree of risk aversion change systematically with age.

Some empirical evidence has been adduced on a number of the implications of life-cycle theory for wealth accumulation. Physical and financial wealth--the value of non-pension assets--may not increase with age (although Mirer, 1979, suggests it does), but it surely diminishes far more slowly than simple life-cycle theory predicts. (See King--Dicks--Mireaux, 1982; and Blinder et al, 1981, for cross-section and Hurd-Shoven, 1982, for longitudinal evidence.) The more recent of these studies point out that wealth, defined as physical and financial wealth plus the discounted value of pension benefits, declines quite rapidly with age.

The evidence on age-wealth profiles is clearly inconsistent with the simple life-cycle model of Modigliani-Brumberg (1954). The very slow decline in wealth during retirement cannot be reconciled by a model that postulates a certain date of death and no planned bequests. Davies (1981) rationalizes this evidence by showing that the paths of noninvestment income and actuarial survival probabilities by age are consistent with consumption that could be generated by highly risk-averse utility-maximizing consumer

facing uncertainty about the date of death.^{3/} There is evidence (David-Menchik, 1981) that bequests form a sizable fraction of lifetime earnings. That being the case, the evidence on the age-wealth profile can also be rationalized by a planned bequest of the principal of the (bequeathable financial) wealth accumulated at retirement, with consumption being financed by non-bequeathable pension benefits and real interest on the principal of the physical wealth.

This discussion rests on evidence on age-wealth profiles. Wealth, however, may be measured with substantial error in the microeconomic data sets that form the bases for most of the studies. Even if not, because the theory is designed to predict life-cycle consumption, it would seem sensible to concentrate on what that theory is most concerned with, namely the pattern of consumption.

III. Data and Methods

To examine the relation of consumption among older workers and their ability to finance it I use the linked Retirement History Survey --Social Security Administration data. The Retirement History Survey (RHS) contains records on over 11,000 subjects, ages 58-63 in 1969, who were interviewed biennially for a decade. In this study I concentrate on information from the 1973 and 1975 interview waves. The RHS is one of the few data sets, and the only one containing only older people, that has information on the spending of a substantial fraction of each household's income. Social Security earnings records for 1951-1974 have been linked to the RHS, enabling one to derive the current or prospective entitlement of members of each household in the RHS.

To remove outliers from the sample and concentrate on behavior among otherwise similar households, I exclude all households other than:

- 1) White male-headed households in which the head was married to the

same wife from 1969-1975; and 2) From among these, households containing persons whose current or most recent job was not in the farm or Federal sectors and who was not currently or recently self-employed.

These disqualifications, and the requirement that information be available on all the spending flows in the survey instrument, reduced the samples to 1797 households ages 62-67 in 1973, and 1422 households ages 64-69 in 1975. In the discussion I analyze the spending of those households with no earnings in the previous year and in which neither spouse is currently working (retired households). There are 426 of these, ages 62-67, in 1973, and 494, ages 65-69, in 1975.

Since the RHS data on spending are the main focus of this study, and since they are not exhaustive of all spending, some consideration of the validity of using them as a proxy for total spending is in order. In the 1973 wave of the RHS spending on the following items is reported: Food consumed at home; food consumed away from home; nonfood groceries; transportation; vacations; and cost of owned or rented dwellings (including utilities, interest and real estate taxes). Also included is an imputation for the implicit rental value of owned housing. In the 1975 wave data on spending are similar, except there are no data on spending for transportation, but spending on miscellaneous items, including gifts, charity, dues to organizations and several others is included.

Are these spending flows representative of total spending? The first row of Table 1 lists the ratio of spending to after-tax income for the complete subsamples in each of the two waves of the RHS (most observations of which had at least one working member). Though the spending data are not complete, they do account for the disposition of roughly half of income flows in each year. More insight into their validity can be gotten by examining spending in comparable categories

TABLE 1

Comparison of RHS Consumption and Income to Values for Families
with Head Age 62-69, 1972-73 Consumer Expenditure Survey (CEX)

RHS Consumption Categories in:	1973	1975
RHS:		
Consumption/After-tax Income	.501	.528
N =	1797	1422
CEX:		
Consumption in RHS Categories/After-tax Income	.551	.503
Consumption in RHS Categories/Total Consumption	.628	.572
Estimates of (1):		
1. All persons:		
a	.024 (2.48)	-.045 (6.65)
b	.633 (151.71)	.640 (215.40)
R ²	.919	.958
N =		2021
2. Persons with Consumption Less than Income		
a	-.009 (-1.01)	.022 (1.94)
b	.666 (46.40)	.578 (36.88)
R ²	.632	.520
N =		1254

in the 1972-73 Consumer Expenditure Survey (CEX) by households in which the head is between ages 62 and 69. Comparing the first and second rows of the table, it is clear that the ratio of spending in these categories to after-tax income is quite close to what it is among households in the RHS.^{3/} Moreover, as the third row shows, spending in these categories accounts for a majority of total spending in the CEX.

Is the sample variation in spending in the RHS categories also like that of total spending? The equation:

$$CRHS/Y = a + b C/Y \quad , \quad (1)$$

where CRHS/Y is spending in the RHS categories, Y is after-tax income, and C is total spending, was estimated using households with older heads from the CEX. The bottom part of Table 1 presents the results: When the entire sample is included, variation in the ratio of spending in RHS categories to income is nearly fully explained by variation in the ratio of total spending to income. Even if one excludes households whose spending exceeds their incomes (a large fraction in this older population consisting partly of households that may be drawing down their financial assets), the coefficient of determination exceeds .5 for both the 1973 and 1975 sets of spending categories on which the RHS presents data.^{4/}

Based on the 1972-73 CEX data this check of the RHS' ability to represent total spending shows quite strongly that the RHS measures spending well in those categories that it covers. Therefore, to compare spending in the RHS to available resources and account for incomplete reporting, I inflate RHS spending by the inverse of the

ratio of spending on RHS categories to total spending in the CEX. This means inflating in the 1973 RHS by $1/.628$ (in 1975 by $1/.572$) to derive total spending, C^* .^{5/}

The spending measures are compared to available resources, both currently and in the future. Among retired households I have data on three sources of wealth: Physical and financial, pension and Social Security. Assuming there is a market in actuarially fair annuities, I annuitize physical and financial wealth (two-thirds of which is the owner's share of owner-occupied housing), I assume a 2 percent real rate of interest, use the 1969-71 life tables for whites, and assume the household is buying a joint annuity. (In this age group letting .03 equal the real interest rate raises the annuity income by about ten percent.)

I treat the resources currently available from Social Security as the benefits generated by the household's earnings history, as reported in the linked SSA data. This stream of benefits was assumed to remain constant in real terms over the household's life. Available pension benefits are based on actual or expected benefits and the characteristics of the plan's provisions for benefits for spouses. Since few pensions are indexed, I assume these benefits would decline in real terms at 6 percent per year. The available resources measure, Y^* , thus consists of the annuitized real value of financial wealth, indexed Social Security benefits, and pension benefits fixed nominally. I assume these are the only resources available to these older households; if this is incorrect, I overestimate C^*/Y^* .^{6/} I also assume that the income flows are untaxed; if this is wrong, I underestimate this ratio.^{7/}

IV. Can The Elderly Sustain Consumption?

The first three columns of Tables 2 and 3 present information on the ratio of current consumption to income currently available from annuitized physical and financial wealth, and from pension and Social Security benefits. In addition to the frequency distributions of these ratios, I show the ratios of average consumption to average income for each of the two samples, and for each divided into two age groups. The asymptotic standard errors of these ratios of means are also shown. The final three columns present the same information based on current consumption and on resources available at age 75 for the 1973 sample (76 for the 1975 sample). (These ages are those at which half the couples can expect both partners still to be alive.) These differ from the first three columns because of the projected decline in the real value of pensions as the household ages.

The most striking finding in the information from Tables 2 and 3 on non-working households is the very high value of C^*/Y^* early in retirement. Current consumption is not sustainable given the financial resources that are on average available to the retired couples in the RHS samples.^{8/} Moreover, this finding does not result from a few outliers with unusually high consumption or very low income: 54 percent of the retired households in the 1973 RHS, and 53 percent in the 1975 RHS, have values of C^*/Y^* greater than 1.1.

Pensions make up a sufficiently large proportion of retirement income in these samples, and the projected decline in real pension values is sufficiently rapid, that current consumption quickly becomes even more difficult to sustain. Roughly two-thirds of the households in each sample would have $C^*/Y^* > 1.1$ at age 75 (76 in the 1975 sample) if they maintained

TABLE 2

Percentage Distributions of Nonworking
Households with No 1972 Earnings, 1973 RHS

Ratio of Adjusted Current Consumption to Potential Retirement Income	Based on Pension Values:					
	Current			At Age 75		
	Age: 62-67	62-64	65-67	62-67	62-64	65-67
<.5	.9	0	1.3	.5	0	.7
.5 - .75	11.7	8.8	12.9	6.1	4.0	7.0
.75 - .9	13.6	12.0	14.3	9.1	4.0	11.3
.9 - 1.1	19.8	20.8	19.3	14.8	13.6	15.3
1.1 - 1.25	12.9	11.2	13.6	13.2	12.0	13.6
1.25- 1.5	14.8	20.0	12.7	27.1	28.0	19.6
>1.5	26.3	27.2	25.9	34.3	38.4	32.5
Ratios of Means *	1.14 (.028)	1.16 (.047)	1.13 (.033)	1.31 (.029)	1.39 (.048)	1.29 (.034)
N =	426	125	301	426	125	301

* Asymptotic standard errors in parentheses here and in Table 3.

TABLE 3

Percentage Distributions of Nonworking Households
with No 1974 Earnings, 1975 RHS

Ratio of Adjusted Current Consumption to Potential Retirement Income	Based on Pension Values:					
	Current			At Age 76		
Age:	65-69	65-67	68-69	65-69	65-67	68-69
<.5	1.6	1.0	2.4	.8	.4	1.5
.5 - .75	11.1	11.8	10.2	6.7	5.9	7.8
.75 - .9	14.0	14.6	13.1	9.3	10.4	7.8
.9 - 1.1	20.3	19.8	20.9	18.8	18.1	19.9
1.1 - 1.25	15.4	14.9	16.0	12.8	15.3	9.2
1.25- 1.5	15.6	15.3	16.0	22.3	19.1	26.7
>1.5	22.0	22.6	21.4	29.3	20.8	27.1
Ratios of Means	1.14 (.024)	1.16 (.027)	1.12 (.026)	1.29 (.026)	1.33 (.033)	1.24 (.037)
N =	494	288	206	494	288	206

consumption at its current level. Clearly, current consumption is inconsistent with the resources available; further, if people in the sample intend to maintain consumption, the evidence in other studies of assets that rise with age is clearly inconsistent with this evidence on consumption.

As the penultimate row of Table 4 shows, Social Security benefits form nearly half of retirement income in this sample.^{9/} Even if one makes a liberal estimate and assumes that Social Security displaces half of the private saving that would otherwise occur, one finds (row (1) of Table 4) that the ratios of average C^* to average Y^* would be far greater than the actual large, unsustainable values presented in Tables 2 and 3.^{10/} Assuming Social Security benefits displace no private saving just reinforces this conclusion: The averages in row (2) of the Table are even more outlandishly high. Indeed, in the majority of households in the sample, spending on items reported in the RHS exceeds the resources available from sources other than Social Security benefits. Looking at the issue somewhat differently, 58 percent of the households in the 1973 sample (58 percent also in 1975) for which $C^*/Y^* < 1.1$ would have $C^*/Y^* > 1.1$ if there were no Social Security (assuming 50 percent displacement of other wealth).

Social Security benefits clearly are very important in maintaining consumption among retirees, even under the strong assumption that they displace private savings on a one-for-two basis. They may also (Kotlikoff-Summers, 1982) be sufficient to allow households to achieve a rate of real consumption during retirement equal to the average sustainable during their working lives. They are not, however, sufficient for most households to maintain real consumption throughout retirement

Table 4

Means from 1973 and 1975 RHS Under Varying Assumptions
About Social Security's Effects on Saving

		1973				1975	
	AGE	62-67	62-64	65-67	65-69	65-67	68-69
$\frac{C^*}{Y^*}$ if		1.51	1.54	1.50	1.53	1.57	1.48
$\partial WLTH / \partial SS^* = .5$							
$\frac{C^*}{Y^*}$ if		2.25	2.29	2.24	2.33	2.43	2.20
$\partial WLTH / \partial SS^* = 1$							
$\frac{SS^*}{Y^*}$.495	.494	.496	.509	.521	.493
$\frac{PEN^*}{Y^*}$.313	.331	.307	.286	.284	.288

equal to its rate early in the retirement years. The evidence suggests (see, e.g., Ghez-Becker, 1975, p. 60) that consumption during the work life follows the inverse J-shaped age-earnings profile quite closely. It may thus be more sensible to evaluate the adequacy of Social Security by comparing its ability to sustain consumption during retirement to consumption observed around the time of retirement than to the average of consumption throughout a household's working life.

V. Responses to Insufficient Savings

Real consumption early in retirement cannot be sustained, given the level of assets possessed by most households and the stream of pension and Social Security benefits available to them. It certainly cannot be sustained if there is a bequest motive, and it is inconsistent with the mounting evidence on the slow rate of decumulation of assets in old age. How do households respond to the nonsustainability of real consumption? One possible response is for one or more household members to reenter the labor force (even though they had been out of the labor force for at least one year). Of the households in the 1973 sample, though, only 9 percent chose this route (had positive earnings in 1974). The mean 1974 earnings (in 1973 dollars) among all households in the 1973 sample was \$93; this would have added only 1.3 percent to Y^* , hardly affecting C^*/Y^* . Clearly, either most of the human capital this sample possesses is fully depreciated, or their leisure has a very high value.

The other response is to change C^* . Comparing columns (2) and (3) within Tables 2 and 3, we see that households with older heads in each subsample have a lower ratio C^*/Y^* than households with younger heads.^{11/}

However, the rate of decline in this ratio with age is not rapid, roughly .01 per year of age in the 1973 RHS, slightly less than two percent per year in the 1975 RHS. The former is not quite consistent with a consumption profile that is sustainable under the actuarial survival probabilities facing households in the sample; the latter is consistent with such a profile.

The comparison of C^*/Y^* across cohorts provides some evidence that retired households cut their real consumption as they age, but its magnitude is too small to explain planned bequests or reductions in consumption consistent with risk-averse behavior in the face of uncertain lifetime. Because the evidence in Tables 2 and 3 is based on different cohorts, and thus possibly tainted by sample heterogeneity, I examine the issue further using a subsample consisting of all 171 households that: 1) Were in the RHS nonworking subsamples in both 1973 and 1975, and thus had no earnings either in 1972 or 1974 and neither spouse working at the time of the interview in 1973 and 1975; and 2) Reported the same size household in both years. Because the spending components differ in the two samples, I redefine consumption to exclude those items that are not reported in both years.^{12/} Information on changes in spending by these households between 1973 and 1975 is reported in Table 5. Spending in current dollars in these categories increased in these households by over 10 percent; less than one-fourth of the households decreased nominal spending by more than 10 percent. If we deflate each spending flow by the appropriate change in the most closely related component of the personal consumption expenditure deflator, the story is completely different: Real spending in these categories in this

TABLE 5

Change in Spending of Retired Couples, 1973-75, N=171

Average Change:								
Nominal (percent)	10.6							
Real (percent), using PCE Deflators	-9.2							
Percent of Households with (Spending 1975/Spending 1973) of:								
		<.5	.5-.75	.75-.9	.9-1.1	1.1-1.25	1.25-1.5	>1.5
Based on:								
Nominal Spending		.6	9.9	15.2	26.3	21.6	15.2	11.2
Real Spending		2.9	22.8	24.0	29.8	7.6	7.0	5.9
Real Spending Relative to Per-Capita Real Spending		4.7	24.6	24.0	28.7	7.6	5.3	5.1

longitudinal data set declined by over 9 percent, and almost half the households cut real spending by more than 10 percent.^{13/}

The decrease in real spending was not merely a reflection of the general slowdown in the growth of real incomes that occurred after 1973. Real consumption spending per capita on a weighted average of the commodities I have included grew by three percent during this two-year period. If we adjust real spending by these households to make it relative to per-capita spending in the U.S., the decreases in consumption are even more pronounced: 53 percent of the households reduced spending by more than 10 percent relative to the average change in real spending.

People in this sample appear to know they cannot sustain real consumption, and they respond by reducing spending by 5 percent per year on the items covered in the RHS samples. While too much should not be made of evidence based only on two years of data, the findings lend strong support to the notion that retired households' age-consumption profile is negatively sloped. The size of the decline in consumption is consistent with a profile of real physical and financial wealth that increases during most of the retirement years.

VI. Explanations and Conclusions

This study has demonstrated two hitherto undiscovered phenomena describing life-cycle behavior. First, I have shown that the resources available to retirees are insufficient to allow them to sustain the level of real consumption enjoyed early in their retirement. Second, both cross-section and longitudinal data demonstrate they respond to this insufficiency by reducing their real consumption as they age. There

are three sets of explanations possible for these findings: 1) Problems of mismeasurement or misspecification in the empirical results; 2) An inability to plan optimally for consumption during retirement because of imperfections in the information available for planning; and 3) Perfect information, with a consumption path either arising from bad planning, from optimal planning under uncertainty, or from a bequest motive.

A number of data problems could be confounding the results. First, the apparent inability of savings to sustain consumption may reflect income sources excluded from Y^* . This seems unlikely: Income other than from pensions, Social Security benefits and assets is a tiny fraction of total income of retirees in data gathered by the Social Security Administration (see footnote 6); and data on older households in the CEX suggest the same thing.^{14/} Future earnings may be expected by these apparently retired households; but that hardly seems likely among the 171 households with no earnings in either 1972 or 1974, and with no workers at the times of the interview in 1973 or 1975, whose spending was shown in Table 5 to decline so sharply. Missing income sources are not a problem. Second, wealth holdings may be underreported. The annuitized value of reported financial wealth in the samples is only 7 percent of Y^* ; and a weighted average of the amount of underreporting of financial assets in a similar survey (Lebergott, 1976, p. 218) suggests 3/4 of such assets are reported. If that is true in the sample used here, Y^* is understated on average by less than 2 percent. Moreover, to explain the decline in C^*/Y^* with age, one would have to argue that underreporting decreases with age, which severely strains credulity. Third, spending may be mismeasured. For example, the people may be "house poor". This is refuted by the calculations shown in footnote 8. Alternatively, C^*

may contain some work-related consumption. This too seems unlikely, for the couples had not been working for at least one year before most of the spending data were recorded. Fourth, even though I have shown real spending falls during retirement, real consumption may not. This is also improbable, partly because I have included consumption of housing services in my measure, partly because it is hard to believe that consumption is rising while spending is falling as rapidly as the data indicate.

One data issue that may have a major effect on the results is a sample selection problem: The retired households may have much shorter horizons than the average household, so that resources are in fact adequate to maintain consumption. There is some evidence (Wolfe, 1982) suggesting that people likely to die early retire early. The bias, though, must be small: It affects only the annuity income from financial and physical wealth, and this represents less than 20 percent of available resources (see Table 4). Even with the effect Wolfe suggests, and thus a higher annuity from assets, consumption cannot be maintained.^{15/} That households in the sample do reduce consumption is further evidence that this bias is minor.

Another possibility is that the 1973-75 period was atypical and that the cuts in spending I observe reflect that. One could argue that households had extrapolated the real increases in Social Security benefits, and were forced to cut back spending in 1974 when they realized that real benefits were to remain constant. A similar argument might be made about the effect of the unanticipated inflation during this period on pension and financial wealth. Tests of these possibilities must rely on additional data from different times.

One source of imperfect information is about life expectancy: The households in the sample may have planned badly because information about

their horizons was poor. It is true that longevity increased very rapidly during the lifetimes of households in the RHS sample. However, I have shown (Hamermesh, 1982b) that people are aware of their current life expectancy, and they even extrapolate secular changes in longevity. This means that the rapid rise in longevity has not had a negative impact on their ability to reach an ex post utility-maximizing choice of the path of consumption. People may also not have expected the unprecedented growth in real incomes that occurred during the years of peak earnings in the RHS cohorts. But if they did not expect this rapid growth to be permanent, they would have saved a disproportionate fraction of their earnings. They clearly did not, suggesting they were not maximizing lifetime consumption according to a plan dictated by a small absolute value of $\rho - r$.

Assuming information about income flows and horizons is sufficient to allow life-cycle planning, how can we reconcile previous findings of slow or no decumulation of financial wealth with my findings of insufficient savings to finance constant consumption, and declining real consumption during retirement? The results could be rationalized by an ad hoc claim that the bequest motive increases in importance as the household's horizon shortens. The rapid rate of decrease in consumption during retirement could also be rationalized in a model of relative risk aversion and uncertainty about length of life in a world of perfect annuities. Unless relative risk aversion increases with age, though, declining consumption during retirement requires that uncertainty about longevity increase with age. I have shown (Hamermesh, 1982b) that this form of uncertainty decreases with age. Thus, in the absence of

evidence on the relation of relative risk aversion to age, uncertainty about lifetimes alone is not a promising candidate to rationalize the findings. Another serious possibility recognizes that there is no perfect market for annuities. To the extent that the change in survival probabilities increases with age, even if $\rho - r$ is small we would observe consumption decreasing with age. This may be important in late old age, but the percentage change in the probability of survival is small in the age bracket 62-69; also 80 percent of Y^* in the samples is actually annuity income--Social Security and pension benefits.

The findings can be rationalized by a combination of a bequest motive, or uncertainty about length of lifetime, coupled with a rate of time preference far greater than the real rate of interest. There is substantial independent evidence that real rates of time preference are very high, at least 10 percent (Heckman, 1976; Hamermesh-Soss, 1974; Kurz et al, 1973). We should not be surprised that, with a fixed amount of financial and physical assets, virtually certain real Social Security benefits up to any horizon, and pension benefits that are known (and expected to decrease in real terms), retired households consume beyond their means early in retirement and rapidly reduce consumption as they age.^{16/}

The implications for the adequacy of Social Security benefits depend on one's views about the ability of people to plan for their future. The benefits are adequate to allow retired households that plan under uncertainty, or wish to leave a bequest, and have a high rate of time preference to realize their consumption plans. One might also, though, take the view, inconsistent with utility-maximizing life-cycle behavior, that many households cannot save sufficiently for retirement, and that Social Security benefits partly offset this

insufficiency.^{17/} My evidence suggests this offset is only partial; it is not enough to enable older households to maintain their consumption.

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FOOTNOTES

¹As two of many examples, the Committee on Economic Security, set up by President Roosevelt to design a social insurance system, stated in its Report (Washington, GPO, 1935, p. 2), "Old age...is a misfortune only if there is insufficient income to provide for the remaining years of life." The House Report on the bill that became the Social Security Act of 1935 (U.S. Congress, 74:1, Report No. 615, April 5, 1935, p. 5) said, "To assure support for the aged as a right rather than as public charity, and in amounts which will insure not merely subsistence but some of the comforts of life,...the bill establishes a system of old-age benefits."

²Skinner (1981) shows that uncertainty about length of life will affect the responsiveness of savings (consumption) to changes in real rates of interest. One may infer from his work that it is difficult empirically to extricate the effects of uncertainty from those of changes in $\rho - r$.

³Among the 31 categories of spending into which Hamermesh (1982a) grouped the CEX data, I use food at home and away from home; rent and spending on owner-occupied housing; utilities and telephone; owned vehicles, other transportation and vehicle operations, and vacations to correspond to the categories of spending included in the 1973 RHS. The correspondence to the 1975 RHS dropped owned vehicles, other transportation and vehicle operations, but added admissions to spectator events, televisions and radios purchases, photography, other recreation, reading materials, and gifts.

⁴If (1) is reestimated on only those households in which the head is a white married male who is not working and whose wife is not working, the R^2 is .989 for the 1973 spending categories, .992 for the 1975 categories. Deleting households for which $C/Y > 1$, the R^2 are .598 and .548 for the two definitions of spending, CRHS.

⁵The goods on which spending is reported in the RHS may have an average income elasticity different from one. The procedure of inflating spending in the RHS by the ratio $1/.628$ will not bias the ratio of the estimate of average spending in the sample to average resources, **I**t will create a systematic bias in these ratios, C^*/Y^* , by income class, though, if the average elasticity is not one. (The bias will be positive for low-income, negative for high-income households if the elasticity is below unity, vice-versa if it is above unity.) Since in fact the income elasticity of commodities included in the 1973 RHS sample is only 1.01 times the average for all commodities in the CEX (1.12 for the 1975 RHS), this potential difficulty seems unimportant empirically.

⁶This bias is likely very small. Among married couples 65 or over in 1976, income from sources other than earnings, Social Security, pensions and assets was only 2 percent of the total. (Social Security Administration, Office of Research and Statistics, Income and Resources of the Aged, 1980.)

⁷Even assuming that all the pension income is subject to taxation, the average couple in the 1973 sample with a head above age 64 would have paid no Federal tax on its 1972 income. A household with average Social Security benefits, but other income twice that of the average, and with only two exemptions (no children, and both spouses under 65) would have paid Federal income taxes equal only to 6 percent of Y^* . This bias too is likely to be small.

⁸Excluding the annuitized value of the owned portion of owner-occupied housing from Y^* and the imputed rent from C^* , and inflating C^* accordingly corresponding to spending in the CEX, I find the recalculated ratio of average C^* to average Y^* to be 1.12 in both samples. This is only slightly below ratios listed in Tables 2 and 3.

⁹This is slightly above the share of Social Security in the incomes of couples 65+ from Social Security Administration, op. cit., footnote 6, once earnings are excluded from the calculation. PEN^*/Y^* is somewhat above the share of pension income reported in that source. Since I exclude the self-employed and ex-government employees, who receive small Social Security income at most, and since my sample includes people early in retirement, before their real pension income has eroded, the estimates in Table 4 seem remarkably close to the estimates covering a much broader sample.

¹⁰Feldstein's (1980) most completely specified and carefully estimated model based on micro data yields an estimate of displacement quite close to .5.

¹¹This is not because of some strange difference in the ages of the wives in the subsamples: Husbands in the younger subsample in the 1973 RHS are 2.9 years younger than those in the older subsample; their wives are 2.0 years younger than their counterparts. Comparable differences for the 1975 RHS are 2.4 and 2.2 years for husbands and wives respectively.

¹²Transportation is excluded from C^* in this comparison from the 1973 RHS for this group, while miscellaneous expenses are excluded from the 1975 RHS.

¹³The correspondence between RHS spending categories and components of the PCE deflator is: Vacations, recreation; imputed rent; owner-occupied dwellings; rent, renter-occupied dwellings; utilities, household utilities; food, off-premise food consumption; nonfood groceries, toilet articles; and food away from home, purchased meals and beverages. Because the RHS data on spending in the various categories are based on different points up to one year before the interview date, the observations on the deflators are chosen to correspond to the quarters when the RHS spending is measured.

¹⁴ Income from sources other than assets, pensions and Social Security, and earnings constituted only 8 percent of the total among all households with a head age 65 or over in the 1972-73 CEX (BLS, Consumer Expenditure Series: Interview Survey, 1972-73, Report No. 455-4, 1977). Half of this small fraction was composed of rental income and income from royalties and roomers, which presumably also stem from physical assets that are included in the RHS measures of assets.

¹⁵ Wolfe estimates that men who retire on Social Security at age 62 have a mortality rate roughly one-third above that of men who retire at 65. His estimated differential for women is somewhat below this. Taking a one-third higher mortality rate for both spouses, and recomputing the value of an annuity using these higher rates raises the payout on a joint annuity starting at ages 65 and 62 for husband and wife only by 11 percent. For the average household in the RHS this would increase Y^* by only 2 percent.

¹⁶ An argument based on declining ability to consume goods because of sharply decreasing efficiency in household production early in retirement is inconsistent with data from the National Health Survey in 1975. Among persons age 55-64 the number of days of restricted activity per year were 28.0; days of bed disability were 9.3 per year. Comparable figures for persons 65-74 were 34.0 and 10.3. Only among persons 75+ do these statistics increase substantially, to 46.2 and 17.4 respectively. (National Center for Health Statistics, Vital Statistics, Series 10, No. 118, p. 20.)

¹⁷ Sobol's (1979) results suggest that blacks' accumulation of physical and financial assets up to the point shortly before retirement is far less relative to their lifetime earnings than that of whites. To the extent they were in covered employment and earned less than whites, progressive Social Security benefit formulae will, though, offset some of this greater inadequacy among blacks than among the whites I examine here.