Insights on Economic Well-being at Older Ages from Analyses of Household Spending

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Abstract

Although income is a widely used measure of economic well-being, it is an indirect or proxy measure because it differs from consumption, a direct measure, due to saving or dissaving and home production. At older ages, especially with the shift of pension plans from the defined benefit to the defined contribution type over the past decades, the ability to finance consumption out of savings is particularly important. This chapter begins with a brief overview of theoretical considerations for using household spending data to study consumption and learn about economic behavior and well-being. Next, we present empirical evidence based on longitudinal data on spending patterns at older ages. We show how spending changes at common retirement ages, the evolution of spending over the remainder of the life cycle, shifts in the composition of spending as people get older and how these patterns vary by demographic characteristics. We then turn to examples of using spending data to learn about economic well-being, such as poverty status, and economic preparation for retirement. We conclude with a discussion of avenues for future research.

Introduction

Consumption is considered the most direct measure of economic well-being. While a household's economic resources (income and wealth) determine its spending possibilities, it is consumption that produces utility. Despite its importance, data availability has limited the study of life-cycle consumption at the household level. Comprehensive data on household spending is rarely collected in general-purpose surveys, which typically query about just a few spending components such as food, rent/housing, and utilities. Longitudinal collection of comprehensive spending information, which is vital in life-cycle studies, is even more scarce.

In the absence of detailed information on household spending, assessments of economic well-being often rely on household (pretax) income, which is a poor proxy of economic well-being for households whose consumption differs considerably from their income, either due to taxes, saving or dissaving. This is especially a problem among older persons many of whom have accumulated retirement savings in order to consume more than their income.

The U.S. Health and Retirement Study (HRS) is a rare exception: it gathers biennial longitudinal data on detailed, total spending of individuals over age 50 and their households. The data can be used to derive total household spending and consumption and it can be linked to the rich information collected in the HRS core survey, which includes detailed information on the complete budget constraint of the household: income, assets and claims on pensions, Social Security, and other annuities.

In this chapter, we first review what economic theory suggests about how household spending should evolve at older ages when assuming utility maximizing behavior to provide a frame of reference for the empirical patterns we observe. We discuss how spending changes at

retirement, the composition of household spending and how this varies by age and marital status, and age profiles of total spending. Then we turn to applications that use spending data to obtain insights on the well-being of older households such as a consumption-based poverty assessment, and assessments of the adequacy of economic resources for retirement.

Theory: Implications from the lifecycle model

Consumption is one of the inputs into well-being. Income and wealth can be used to purchase consumption, but they do not have independent value as they do not directly produce utility. For example, wealth is valuable because it can finance consumption, and it is particularly valuable if the environment changes adversely. Wealth has value in bequests because it can finance consumption for inheritors. But it is consumption that produces utility, and therefore it is the core argument of the utility function; income and wealth define the household's budget constraint. In the context of the life-cycle model, the most widely used framework for analyzing individual and household decision-making, agents choose consumption, within and across periods, to maximize utility over the life cycle. The model solution produces the optimal affordable consumption path. Although it covers the entire lifespan, we focus in this chapter on its implications for the consumption trajectory at older ages, defined to be from about the time of retirement to the end of life.

Simple life-cycle model. A simple version of the standard life-cycle economic model accounts for uncertainty about the time of death and assumes that there is no bequest motive. The solution specifies that consumption will decline with age, although when that will happen depends on utility function and environmental parameters (Yaari, 1965). The driving force

causing spending to decline is that mortality risk increases with age: in the absence of a bequest motive wealth not consumed prior to death is wasted. To reduce the risk of dying with high wealth, individuals can increase lifetime utility by consuming more earlier so as to carry over less wealth into advanced age where mortality risk is high. However, those who survive, will need to reduce consumption (and therefore reduce the rate of wealth depletion) to guard against having to excessively reduce consumption in a future period should they be even more long lived. This leads to the prediction that consumption should decline at older ages. The trajectory should have a negative slope and the negative slope does not signal a lack of optimizing behavior. In the presence of annuities, like Social Security benefits, consumption would decline until it reaches the level of income from annuities, after which the consumption path would follow the annuity income path.

Extensions. Many variations of the basic life-cycle model result from the introduction of sources of uncertainties and their magnitudes. For example, extending the model from single-person households to couples introduces the need to account for both the mortality risk of self and spouse. The chance that both die in the same period is low and any wealth not yet consumed at the death of the first spouse is not wasted as it can still be consumed by the surviving spouse. Therefore, less consumption needs to be brought forward, flattening the consumption path. Further extensions would account for other important uncertainties faced by older households, such as those associated with out-of-pocket medical expenses, long-term care costs, rate-of-return risk, and inflation. Increased uncertainty flattens the predicted consumption trajectory but is unlikely to eliminate the negative slope because mortality risk increases exponentially, eventually dominating other considerations. The uncertainty leads to greater holding of wealth to

guard against bad stochastic outcomes so that less of the household's wealth is consumed and more (accidentally) bequeathed.

A number of mechanisms reduce uncertainty. For example, several government programs provide insurance against excessively low consumption (e.g., Social Security benefits, Medicaid, Supplemental Security Income). In addition, some households receive income from an employer-provided defined benefit pension, or others may rely on assistance from their extended family.

Home Production. Individuals may be able to achieve a given level of utility by substituting time inputs for purchased goods. For example, they could use time to find locations that sell items at a lower price; they could consume meals they cooked at home from purchased ingredients; or they might perform their own home repairs and maintenance. Compared to working, individuals in retirement have more time available for these activities and time becomes cheaper. An important implication for spending in retirement is that households may not need to spend as much in retirement to achieve a given level of consumption.

The role of health. There are several ways in which health interacts with spending, suggesting that utility production is health dependent. Some types of spending are substitutes for health, some are complements, and others are neutral (gifts and donations). When in good health, individuals derive utility from spending on goods and services that are complements, such as travel, that would produce little utility when in bad health. Conversely, they derive utility from spending on health care when in bad health (substitute). Because health declines with age, this health-spending interaction is reflected in the composition of household spending (budget shares). Another channel through which health interacts with spending is via home production. When in bad health individuals' ability to use time as an input to consumption is reduced, as working in the house or garden is physically more burdensome.

Measurement. While total consumption is not directly observable, household spending is a close proxy that can be adjusted to obtain a measure of consumption. The main differences are that (i) durables are purchased in one period but consumed over multiple periods;[1] (ii) spending by one person can be shared with or consumed by another person (e.g., housing); (iii) some consumption can be achieved by using time as an additional input as in home production which can either replace or complement market-based spending. To ask respondents in a household survey about their consumption (such as the flow of owner-occupied housing services) is not feasible. Our main data source asks about spending, so we will present empirical results on spending patterns. In applications to learn about household well-being we adjust household spending to account for the consumption of durables and owner-occupied housing to obtain a close proxy measure of households' total consumption.

Data

Our analyses are based on data from the Health and Retirement Study (HRS) and its supplement, the Consumption and Activities Mail Survey (CAMS).[2] The HRS is a biennial panel. Its first wave was conducted in 1992. The target population was the cohorts born in 1931-1941 (Juster and Suzman, 1995). Additional cohorts were added in 1993 and 1998 so that in 1998 it represented the population from the cohorts of 1947 or earlier. In 2004 more new cohorts were added making the HRS representative of the population 51 or older. The HRS is very rich

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[1] Averaging spending on durables across the population or by subgroups yields an estimate of average consumption on durables.

[2] The Health and Retirement Study is sponsored by the National Institute on Aging (grant number NIA U01AG009740) and is conducted by the University of Michigan.

in content and – importantly for this study – stands out for its high-quality and detailed information on economic resources.

The Consumption and Activities Mail Survey (CAMS) is a supplemental survey to the HRS; it is administered to a random subsample of HRS households.[3] One of its main objectives is to elicit total household spending over the preceding 12 months which can be linked to the rich information collected in the HRS core survey on the same individuals and households. The first wave of CAMS was collected in the Fall of 2001, and longitudinal follow-up surveys have been conducted every two years since then. When HRS inducts a refresher cohort into the survey, a random-subsample of households that are part of the refresher group are also inducted into the CAMS.

CAMS is administered as a mail-out survey. Initially it queried about spending in 32, later 39 categories to obtain a complete measure of annual spending. Total spending in CAMS aggregates closely to total spending from the Consumer Expenditure Survey (Hurd and Rohwedder, 2015). For example, among those 65 to 74, and 75 or older, CAMS spending in 2007 was $40,700 and $29,400 respectively; in the CEX such spending was $39,700 and $29,400.[4]

Empirical Evidence: Spending Patterns at Older Ages

Change in Spending at Retirement

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[3] For example, HRS 2020 obtained interviews from 11,490 households; in the fall of 2021, HRS sent out 5,166 CAMS household spending questionnaires, of which 2,986 were completed and returned to HRS.

[4] These cross-section figures should not be interpreted as life-cycle variation in spending. Spending paths constructed from two-year panel changes in CAMS do decline with age, as we have shown in prior work and will show in updated results below.

Marginal utility, which depends on consumption, should evolve smoothly over the life cycle: were there to be a large change, a reallocation of consumption across the jump would increase total utility. This imperative has been taken to mean that consumption should evolve smoothly, but that view is inaccurate if there are other inputs into utility that interact with consumption. Time is such an input: it can be combined with purchased goods to produce utility, so that if more time suddenly becomes available, spending on purchased goods would also suddenly change. Thus, certain life events, such as retirement, should result in a change in household spending and the direction and size depends on individual circumstances. Consider the simplest case of a one-person household where the individual retires from a full-time job to not working at all. Several changes ensue: income from work stops and so do work-related expenses; the individual has about 2,000 hours of time to reallocate from work to either leisure, self-care or home production. Some uses of time are complementary to spending (travel), some are substitutes (home production), and the ultimate mix will be the result of personal choice, strongly influenced by the individuals' economic circumstances (resources available to afford traveling, for example), the individuals' health and marital status (more difficult and less enjoyable to travel when in poor health or alone).

There is a sizeable literature on how household spending changes at retirement.[5] Based on panel data from the HRS, we found spending declined by 4.4 percent at the median, which is

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[5] The early literature was concerned with documenting and understanding the retirement-consumption puzzle which refers to finding a large drop in spending on food at retirement (e.g., Banks et al., 1998; Bernheim et al., 2001). This was considered a puzzle, because according to the simple one-good life-cycle model consumption should be smooth. Subsequent studies noted that at retirement households may increase home production or use time to shop more cheaply so they can achieve about the same level of consumption after retirement as before retirement (Hurd and Rohwedder, 2003 & 2005; Aguiar and Hurst, 2005; Hurd and Rohwedder, 2013). Also, using longitudinal data on total spending, we found that spending declined only by 4.4 percent at the median, which could easily be explained by increases in home production (and smart shopping and the cessation of work-related expenses). But there were larger declines if poor health led to earlier than expected retirement.

a magnitude that would be consistent with increases in home production, smart shopping, and the cessation of work-related expenses. But perhaps more importantly, we found substantial heterogeneity by economic status in spending change at retirement, consistent with the view that the extra time available in retirement can be used to complement or to substitute for market purchased goods. In the upper half of the wealth distribution total spending increased at retirement. In the low-wealth population spending declined, and the main explanation appears to be early retirement due to poor health. For a minority of the population a short planning horizon possibly contributed to reduced spending at retirement because wealth was not adequate to maintain consumption when earnings and income dropped (Hurd and Rohwedder, 2003 & 2005, 2013).

Spending trajectories

At the population level, the simple life-cycle model predicts spending to decline with age because of increasing mortality risk and in the extended life-cycle model possibly because of declining health. In the case of married households, a substantial spending decline will happen at widowing: for example, the returns-to-scale parameter embedded in the Social Security program suggest that a widow(er) needs about two-thirds of the consumption of a couple to achieve the same level of economic well-being. Large out-of-pocket medical and long-term care expenditures could result in spending increases for some households, but it is an empirical matter whether this effect is large enough to counteract the downward trend in other spending categories.

Because we seek the population rate of change in spending at each age we need to control for mortality. If we were to use a balanced cohort of survivors to some advanced age, the rates of change observed at earlier ages would be conditioned on survival to that advanced age; yet the basic life-cycle model says that those long-lived persons would choose a flatter consumption path earlier in life than shorter-lived persons. The upshot is that the rates of change in consumption by the long-lived persons would misestimate the population rate of change of consumption at earlier ages. Therefore, we estimate rates of change at each age from all households that are observed in two adjacent waves beginning with that age. Or said differently, we estimate rates of change over the population that was alive at each age. To implement this, we stacked all adjacent CAMS wave pairs (t and t+1) and computed the rate of change by 5-year age bands, stratifying by marital status and by initial wealth quartile, that is, the household's wealth position at age 65 compared to other households of similar ages and same marital status.[6] We then used the estimated rates of change to trace out the spending path from age 65 onward (see Figure 1).

The central finding is that the spending paths decline for all groups (single, married; high and low initial wealth). This is consistent with life-cycle model predictions and confirms that spending decline *per se* is likely not the result of tightening budget constraints, because those with high resources reduce spending as they age in a fashion similar to households with fewer resources.

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[6] Specifically, for each household in CAMS that contributes one or more spending transitions for estimating the spending trajectories, we used the long HRS panel to find the wave when the household was observed closest to age 65. Within that wave we compared that household's wealth position to that of other households of that same 5-year age band and same marital status. See Hurd and Rohwedder (2023) for further details.

The households of married persons have larger rates of decline than single persons (average annual rate of change of -2.7 ppts compared to -2.0 ppts). If the couple survives to age 85, spending is about 50 percent of what it was at age 65 among those from the second through highest initial wealth quartile, and about 42 percent of what it was at age 65 among those from the lowest initial wealth quartile. The spending path is flatter for those with higher average life expectancy (higher initial wealth) which is also consistent with the predictions from economic theory: these groups shift less consumption to earlier ages because of their elevated chances of survival and the corresponding need to preserve resources for old age.

For single persons with relatively low initial wealth (bottom two quartiles), spending at age 85 is about 50 percent of what it was at age 65. The reductions are smaller for the two highest wealth quartiles (third and highest): spending at age 85 is about 62 percent of what it was at age 65.

Budget Shares

A key issue is whether the decline in spending is forced on individuals because of an unexpected tightening budget constraint or is it the result of optimizing choice? In the Yaari (1965) framework, individuals choose to consume "too much" early in retirement with the knowledge that, should they survive, they will reduce spending. Thus, the lifetime budget constraint is a determinant of the path, but a decline is not evidence of inadequate preparation for retirement or of a mistake. In other frameworks such as a behavioral framework, the decline may signal a lack of forward-looking behavior: the individual is surprised that economic resources are inadequate and must reduce spending.

We examined categories of spending or budget shares to look for evidence about these hypotheses. Figure 2 shows the share of total spending devoted to six categories of spending stratified by marital status. As would be anticipated, the share on health care increases with age; further, the share spent by single persons is not greatly different from the share spent by couples showing that in health care spending there are very limited returns-to-scale. The moderately higher share among couples is the result of their higher economic status. The share spent on transportation (automobiles) reaches a peak in the 50s and then declines. It may be noted that the decline accelerates when people are in their 70s. While retirement may play a role earlier, a plausible explanation for the later decline is that health conditions limit the desire for extended car travel, and also increase the perceived risk of driving. The pattern for trips and vacations is likely the result of several factors. The relaxing of the time constraint due to retirement permits increased travel in the late 60s and early 70s. The subsequent decline is likely due to worsening health which makes travel more difficult. Single persons spend much less than married persons likely due to a lack of companionship in some cases.

The evolution of budget shares with age for transportation and trips and vacations suggest that health plays a role in spending: some types are complementary with health such that when health is good people spend more; some types are substitutable with health such as health care spending itself which is increased when health declines. Some are likely neutral such as gifts and donations.

In terms of life-cycle spending behavior, individuals will want to spend more relatively early in the retirement years when health is good, with the anticipation that later, when health has deteriorated, they will reduce spending on items that are complementary to health. In our data these reductions outweigh increases in spending on health itself resulting in a decline in total

spending. This interpretation is strengthened by the evolution of the budget share for gifts and donations. Under the assumption that spending on them is neutral with respect to health, the fact that their budget share increases sharply with age suggests that the decline in total spending that we documented is largely not due to an unexpectedly tightening budget constraint; rather it is suggestive of a lack of desire to spend on a number of categories that require good health combined with an alternative to a bequest: intervivos transfers.

Discussion

Declining spending paths for all socioeconomic status groups, including the most well-off, suggests that the reductions in total spending are mostly not forced by unexpectedly tightening budget constraints. An explanation based on budget share data is that worsening health can lead to reduced spending across some categories, and while spending on health does increase, its increase is less than the reduction in those categories so total spending declines. To obtain additional evidence on this issue we added to the CAMS 2019 survey questions on whether the individual's enjoyment from spending on certain categories had increased, decreased, or stayed the same compared to six years earlier. The objective of the questions was to find whether marginal utility for these spending categories had changed. We found that at advanced ages (75+) close to 50 percent said they got less enjoyment from traveling and this fraction was steeply increasing in age, reaching 75 percent for those age 85+ (Figure 3, left panel). Similar patterns emerged for enjoyment from "having a new car" or from "having new appliances, TV, PC, etc." and several other spending related activities. Averaging across all seven of them by age band gives the right panel of Figure 3 which shows that reductions in enjoyment

increase in prevalence with age. Regression analyses of whether someone reported reduced enjoyment was strongly related to being in poor health (Rohwedder, Hurd and Hudomiet, 2022).

Insights on Economic Well-being of Older Households

In this section we discuss examples of policy-relevant applications that use data on consumption to draw inference on the economic well-being of older households. Because consumption is more directly related to well-being than either income or wealth, it can provide a more accurate measure of well-being. To obtain a measure of consumption from the spending measure observed in CAMS we replaced spending on durables and housing with estimated consumption services from durables and owner-occupied housing.

Consumption-based poverty assessment

Official poverty rates are based on pre-tax income. But there are a number of reasons for assessing poverty in the older population based on consumption rather than on income. It is widely accepted and not controversial that consumption is more directly linked to well-being than income. This difference is particularly relevant for the older population: wealth is widely held by older persons and that wealth can be used to purchase additional consumption beyond what can be supported by income. A stylized simple model would be: Prior to retirement consume less than income; after retirement consume more than income. It would then be logical to base a poverty measure on consumption rather than income.

The difference between income-based and consumption-based poverty rates is expected to vary with age and therefore has implications for age-related welfare judgments. For example:

- Tax rates decline with age.

- Many older households use retirement savings to finance a consumption level that is greater than after-tax income where that difference is financed out of wealth.

- Consumption-in-kind is more important for older compared to middle-aged households

  o because of Medicare and Medicaid

  o consumption of housing services by homeowners

    ▪ homeownership rates peak at 70-74

    ▪ ownership of housing declines with age albeit slowly;

  o service flows from durables

    ▪ Older households may depreciate their durables more thoroughly so that they would still have a flow of consumption even though expenditures are nil.

We used HRS data to estimate income-based poverty rates and found the HRS measures to be similar to CPS measures. To estimate consumption-based poverty rates we used HRS core data on the value of housing, automobiles durables and spending on nondurables from CAMS. We imputed a service flow from five durables, automobiles, and housing (rather than spending on housing). Because of the lack of agreement among researchers, we followed the method of the official poverty rate calculation and did not place any value on Medicare or Medicaid, even though we recognize that those programs certainly have considerable value to the older population. Similarly, we do not include health care consumption financed by others such as employers. While the HRS core queries about gifts and money received from others outside the household, it does not distinguish between them, so we do not include non-money gifts received from others. We do include out-of-pocket spending for health care. Because of substantially more

noisy measurement of income and consumption in multi-generational households we confine our analysis to single persons living alone and to couples living alone. The methods are discussed in detail in Hurd and Rohwedder (2006).

The consumption-based poverty rates estimated from CAMS waves 2001-2013 and the adjacent HRS waves are shown in Table 1. Overall, consumption-based poverty rates are substantially lower—slightly less than half—than those based on after-tax income, both for singles (7.6 ppts vs 16.0 ppts) and for married persons (1.5 ppts vs 3.3 ppts). This is consistent with the older population's ability to rely on savings to complement their income to finance consumption. Both measures show higher poverty rates at relatively younger ages. Among those who survive to advanced ages (75+) consumption-based poverty is 6.1 percent among single persons, and 1.2 percent among married persons. Married persons have very low poverty rates, 1.5 percent by consumption and 3.3 percent by income.

Economic preparation for retirement

To assess the financial security of the older population and how it varies by subgroups we used a simulation model that we have developed over a number of years (Hurd and Rohwedder, 2012; 2023a, 2023b, 2024). Broadly we ask whether the economic resources of the household can support a projected trajectory of spending from retirement to the end of life. The main features of the simulation model are as follows: We estimated consumption paths using CAMS panel data on spending. We estimated separate paths by marital status and education because theory suggests that the slopes of spending paths will vary according to mortality risk: the "mortality risk" of a two-person household depends on the mortality risk of each person, and

mortality risk varies strongly by education level. In the CAMS we observed initial spending of individuals and couples in the age range 66-69. The simulations find whether the individual or couple can maintain a spending trajectory which is anchored at the initial level and which follows the observed spending trajectory (subject to stochastic shocks) without running out of wealth. To do that we simulated spending paths until death and tracked changes in economic resources: if spending exceeded after-tax income wealth was decumulated to fill the gap. Our estimations and simulations account for differential mortality risk and, for couples, the lifespan for each spouse and the loss of returns to scale in consumption at widowing. We permit the rate of change of consumption to vary by marital status, age and education because of the different levels of mortality risk by education and because of the interactions between health (which varies with education) and consumption. We incorporate the risk of large out-of-pocket spending on health care by assigning spending shocks from the observed distribution of such spending. We also account for taxes which can substantially reduce resources available for consumption among households with large holdings of tax-advantaged savings but not for those with little tax liability. Rates of return vary by asset type and are applied to each individual household's remaining portfolio in each simulation period. Most of the model elements permit heterogeneous response as a function of age, sex, marital status, and education.

We used this model to perform repeated simulations of the spending path of each individual or couple to estimate the probability the individual or survivor would die with positive wealth (Hurd and Rohwedder, 2012; 2023a, 2023b, 2024). We considered an individual to have adequate preparation for retirement if 95% of our simulations indicated positive wealth at death.

Using HRS data through 2016 and CAMS data through 2017, we found that 47.6 percent of persons initially single at ages 66 to 69 (N = 1,125) were adequately prepared for retirement,

and that 78.8% of married persons (N=1,579) were adequately prepared for a weighted average of 65.9% (Table 2). However, we found there was considerable heterogeneity in economic preparation: just 22% of single females lacking a high school education were adequately prepared. Black, and Hispanic persons were less likely to be prepared than Non-Hispanic White persons. The gap is particularly large among those initially single: 58.2% of Non-Hispanic White persons but just 28.0% of Black and 27.2% of Hispanic persons were prepared.

While higher levels of economic preparation would certainly be desirable, our consumption-based measure shows considerably higher levels of preparation than income-based measures. For example, the Retirement Risk Index stood at 51% in 2010 (Yin et al, 2024) which would be at about in the middle of our sample period. That is, the RRI estimated that 49% were not at risk whereas we found that 66% were adequately prepared. The income-based measures do not take into account a number of the observed empirical regularities in actual spending that the longitudinally based spending paths do. Several deficiencies stand out. For example, according to our calculations, life-expectancy conditional on reaching age 65 can vary across subpopulations defined by marital status, sex and education by as much as 20 years. Because greater life expectancy is positively correlated with economic resources the well-to-do and the less well-to-do have different saving requirements. This differential is accounted for in our model but not in income-based measures. Secondly, spending declines with age, and apparently the decline is not primarily driven by a reduction with age in economic resources but rather, at least on average, is chosen. This reduction is particularly important if most of spending in retirement is financed by Social Security. For example, if half of a household's spending were financed from Social Security the need for private wealth accumulation would vary 2:1 with the reduction in lifetime spending; thus, a 15% decline would reduce required wealth accumulation

by 30%. Taxes decline after retirement. We track taxes in our simulation model and according to our most recent estimate single persons had an average total tax rate of 4.8% during its retirement years. Couples had an average rate of 7.3%. These rates are much lower than average tax rates during the working life.

Conclusions and Directions for Future Research

The empirical evidence on household spending of older households presented in this chapter is consistent with an augmented lifecycle model in which consumption is produced with spending and time inputs, and utility from consumption depends on health status. Such a model predicts heterogenous change in spending at retirement, that is, some households increase others reduce spending at retirement; spending paths that decline with age after retirement, while the composition of spending shifts as health declines, reducing spending that is a complement to good health (travel, leisure, etc.) towards spending that substitutes for good health (health care). As confirmed by respondents' own assessments, for many older adults enjoyment from certain types of spending decreases as they age and their health declines, providing another reason for spending reductions that are chosen and not the result of unexpectedly tight budget constraints. We documented variation by socioeconomic status in observed spending patterns: flatter spending paths for those with higher initial wealth (and greater life expectancy). This is also in line with model predictions. For example, spending declines at a smaller rate among high socioeconomic status households compared to those from low socioeconomic status groups.

These findings have important implications for financial planning for retirement. If declining spending paths over the course of retirement are consistent with households' preferences, as suggested by the fact that similarly declining spending paths are observed across

all economic status groups, even among the well-to-do, then households need so save less for retirement compared to assuming that spending is flat or even increasing in retirement.[7] Our microsimulation model, which uses the declining spending paths in assessing the fraction adequately prepared for retirement, therefore comes to more favorable conclusions than other models. We found that 65.9% of older adults aged 65-69 are adequately prepared for retirement, that is, the chances that they would have positive wealth at death is 95 percent or higher. Consumption-based poverty rates are about half of those based on (after-tax) income, reflecting that many older households use retirement savings to finance consumption in excess of their income. Still, some groups fare substantially worse, and it will be important to better understand the causes for the disparities. The fraction adequately prepared is particularly low among single female individuals with less than a high-school education, and among Non-Hispanic Black and Hispanic single older adults.

Using consumption data for analyzing the economic well-being of older households permits more accurate identification of economically vulnerable populations, an important prerequisite for studying underlying causes and for designing effective solutions.

There is a wide range of opportunities for future research leveraging spending data more generally, and the longitudinal CAMS spending data of the HRS in particular. For example, more work is needed on quantifying the importance of home production and its contribution to household consumption. We discussed earlier that utility derived from consumption depends on health status, and so does the ability of engaging in home production. Future investigations should analyze these interdependencies further. Another important topic is how individuals'

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[7] The National Retirement Risk Index assumes a flat spending path while many financial advisors reference the "retirement smile" by David Blenchett (2014) suggesting that spending increases at advanced ages.

expectations about the future and perceived sources of uncertainty impact households' spending decisions. This does not just have implications for the intertemporal allocation of resources for individual households, but it also has macro-economic effects. For example, with the shift from defined benefit to defined contribution pension plans over the past decades, households have had to assume greater uncertainty with respect to investment returns and longevity risk. Moreover, more research is needed on the heterogeneity in preferences regarding spending composition and spending trajectories, for example, by cultural background, family structure, race and ethnicity. A challenge to progress on these issues is the limited sample size of the CAMS data, which otherwise stands out for the longitudinal spending information and richness of the linked HRS data.

Promising innovations have come from research studies using spending data from financial transactions (e.g., Morgan Chase Institute), including scanner data. These data sources often lack detailed information beyond what is available in the administrative or transaction data. A powerful combination would be if financial transactions data could be linked to household survey data.

Figures

Figure 1. Spending paths, single and married persons, by initial wealth quartile


A. Single Persons

B. Married Persons
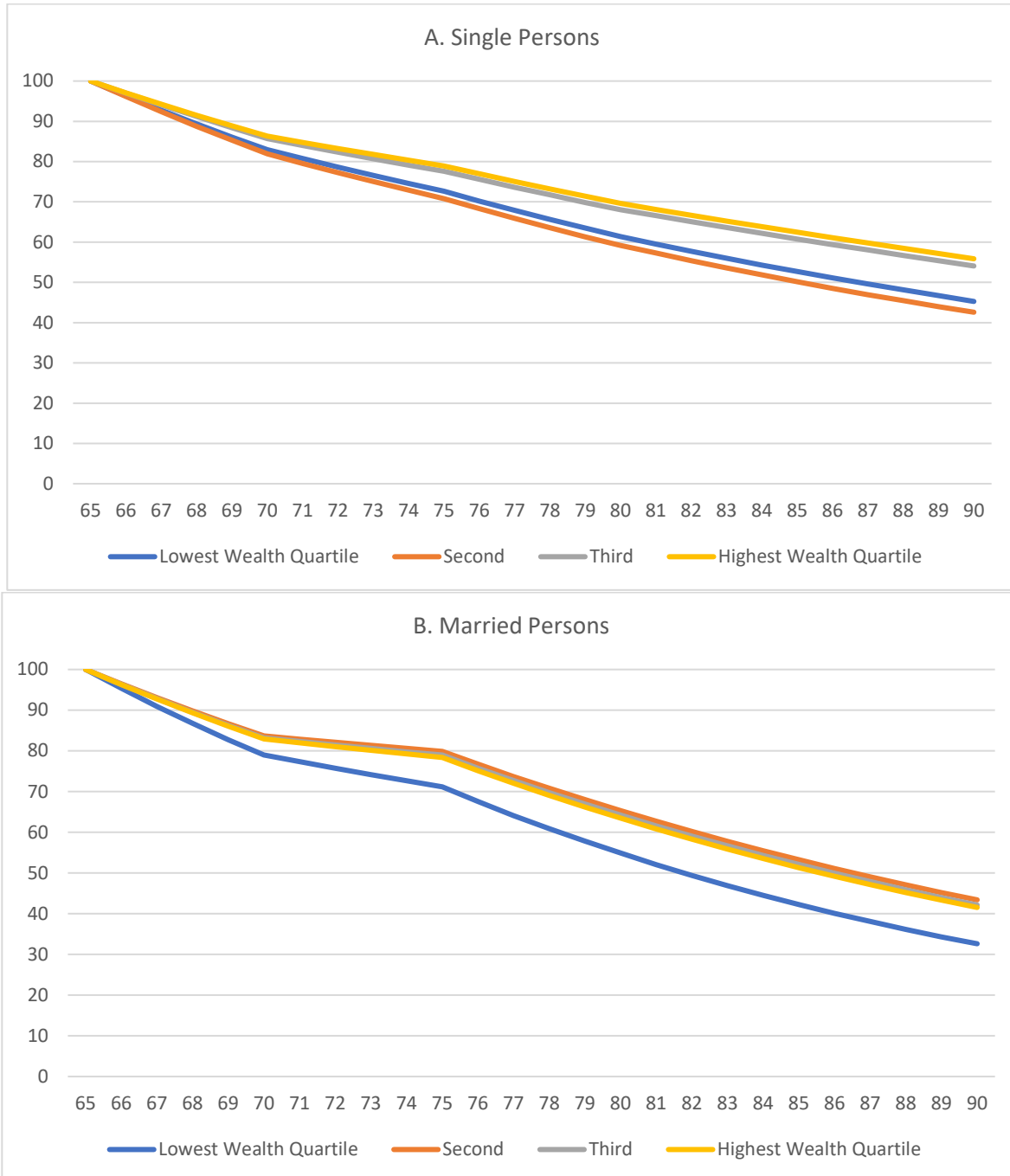
Source: Authors' calculations, CAMS waves 2005-2021. The initial wealth quartile is determined using the long panel of the HRS data. For each CAMS observation used in estimating the spending paths we obtained the household's wealth position from the HRS wave nearest to when the individual was age 65, relative to other households of the same wave with the same marital status and part of the same 5-year age band. See Hurd and Rohwedder (2023) for further details.

Figure 2. Budget shares by age and marital status

Notes: Authors' calculations based on CAMS 2011 – 2021, pooled. The budget shares are calculated as spending on category [x] divided by total household spending. Observations with highly incomplete data dropped (i.e., those who reported fewer than 10 out of about 39 spending categories, about 1.5% of the sample).

Figure 3. Reported Changes in Enjoyment in Traveling, and average enjoyment scores by age for 7 activities.
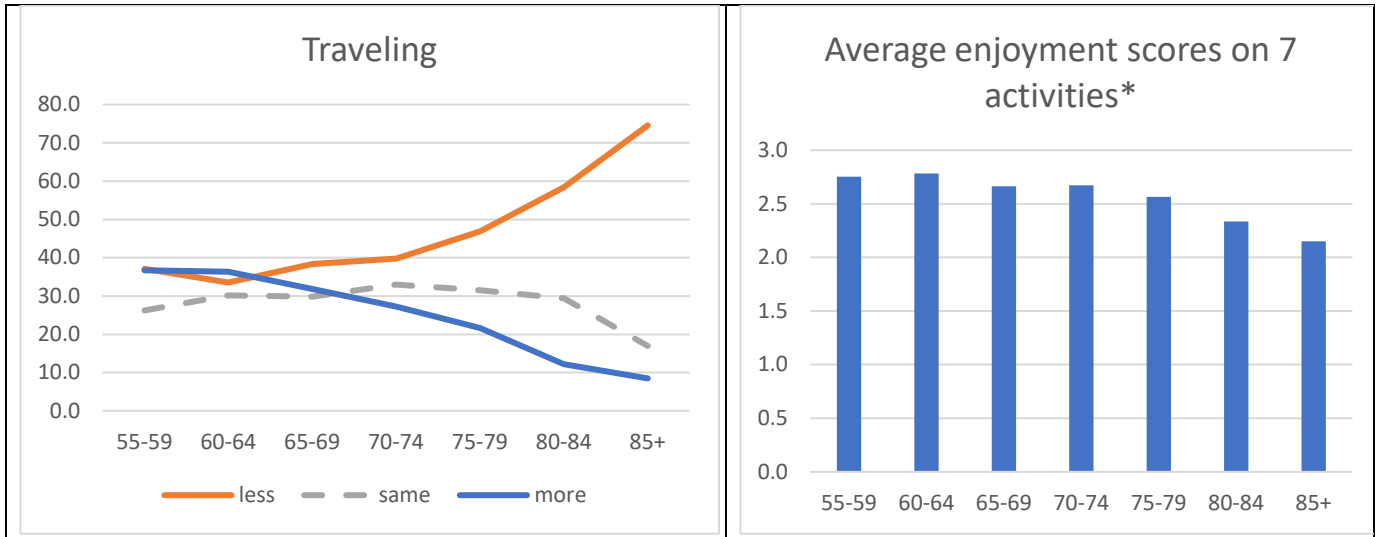
Source: Authors' calculations based on CAMS 2019. See Rohwedder, Hurd, Hudomiet (2022) for further detail.

* The seven activities were: traveling, going out to eat, leisure activities, having a new car, having new appliances, providing financial support to family/friends. The change in enjoyment was scaled from 1 (much less) to 5 (much more). A score of 3 corresponds to "no change." The average score in Figure 3 (right panel) is less than 3 at all ages, that means enjoyment declines on average across all age bands, and the decline accelerates with age by 0.6 of an enjoyment category (2.8 at age 55-59 to 2.2 at age 85+).

Table 1. Poverty rates, single and married persons, consumption- and after-tax income-based

	Single persons		Married persons	
	Consumption	Income*	Consumption	Income*
55-59	9.0	22.4	2.3	4.8
60-64	9.5	19.1	1.6	3.7
65-74	7.8	14.6	1.2	2.8
75+	6.1	13.1	1.2	2.1
All	7.6	16.0	1.5	3.3

*In Census Bureau Statistics income-based poverty rates are traditionally computed on pre-tax income. Here, we report poverty rates based on after-tax income because that concept is closer to consumption than pre-tax income. As an empirical matter the difference is trivial: 0.32 ppts among couples and 0.19 ppts among single persons. See also Hurd and Rohwedder (2006) for detailed comparisons of pre- and post-tax poverty rates.
Source: Authors' calculations based on CAMS waves 2001-2013 and HRS waves 2000-2012, after-tax income calculated using the NBER TAXSIM calculator.

Table 2. Percent adequately prepared, defined as 95–100 percent chance of dying with positive wealth.

	Single Persons				Married Persons			
	N	All	Males	Females	N	All	Males	Females
Education								
Less than high school	274	27.0	45.6	22.1	221	69.2	72.1	67.4
High school	417	54.4	67.0	50.6	626	79.2	81.8	78.3
Some college	266	48.1	52.6	46.9	369	78.0	70.5	81.1
College and above	168	63.1	58.5	64.6	363	84.8	86.9	83.7
All	1,125	47.6	57.5	44.7	1,579	78.8	79.0	78.8
Race/Ethnicity								
Non-Hispanic White	717	58.2	64.5	56.1	1,265	81.9	82.8	81.5
Non-Hispanic Black	271	28.0	38.2	25.5	157	65.0	65.5	64.6
Hispanic	103	27.2	57.9	20.2	129	64.3	60.5	65.9
All*	1,125	47.6	57.5	44.7	1,579	78.8	79.0	78.8

Source: Authors' calculations, HRS 2002–2016, and CAMS 2003–2017, based on methodology employed in Hurd and Rohwedder, 2012, using more recent data. *Includes 61 observations whose race/ethnicity is "other."

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