Consumption and Health Among the Elderly

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Abstract

- We investigate how spending and the composition of spending change as a result of the onset of limitations in activities of daily living (ADLs and IADLs).
- Combining longitudinal data from the Consumption and Activities Mail Survey (CAMS) and the Health and Retirement Study (HRS), we construct a test aimed to identify the presence of state-dependence in the marginal utility of spending in an intertemporal context.
- We find evidence that the marginal utility of total spending decrease with the onset of activities of daily living (ADL) limitations, hence resulting in negative state-dependence. Aggregate spending increases as a result of the onset of IADL limitations, which is consistent with negative state-dependence, but could also be the result of a life-cycle effect because subjective survival also decreases as a result of such shocks.
- We find evidence of some reshuffling of spending across categories and wealth portfolio by reallocating housing and transportation wealth to financial wealth.

Main Objectives

1. Propose a theoretical framework that explains the state-dependence of utility in environment with multiple consumption choice.
2. Investigate how spending and the composition of spending change as a result of the onset of limitations in activities of daily living (ADLs and IADLs).
3. Propose an empirical strategy in order to test formally for state-dependence of utility.

Theoretical Framework

$$\max_{\{c_{j,t}\}_{j=1}^{J}} \sum_{j=1}^{J} \delta_j(h_t) \frac{c_{jt}^{1-\sigma_j}}{1-\sigma_j} \tag{1}$$

under intra period budget constraint:

$$\sum_j c_{j,t} = m_t. \tag{2}$$

The solution is such that:

$$\frac{\partial u(\mathbf{c_t}, h_t)}{\partial c_{j,t}} = \frac{\partial u(\mathbf{c_t}, h_t)}{\partial c_{k,t}}, \quad \forall j,k \tag{3}$$

and the budget constraint holds.

Replacing the solution for each consumption items $c_{j,t}^*(m_t, h_t)$ as a function of total spending into the utility function, we obtain the indirect utility function $v(m_t, h_t)$. Hence, the intertemporal choice of m_t is given by:

$$V(w_t, h_t) = \max_{m_t} v(m_t, h_t) + \beta(1 - p_m(h_t, t)) \sum_h V(w_{t+1}, h_{t+1} = h) p_h(h_{t+1} = h | h_t, t) \tag{4}$$

subject to the law of motion for wealth $w_{t+1} = R(w_t + y_t - m_t)$. Without borrowing constraints, the solution for the path of m is governed by the Euler equation:

$$v'(m_t, h_t) = R\beta(1 - p_m(h_t, t)) \sum_h v'(m_{t+1}, h_{t+1} = h) p_h(h_{t+1} = h | h_t, t) \tag{5}$$

and the lifetime budget constraint. Upon finding a solution for $m_t^*(w_t, h_t)$, we can obtain a solution for each spending item by solving:

$$\frac{\partial v(m_t^*(w_t, h_t), h_t)}{\partial c_{j,t}} = \frac{\partial v(m_t^*(w_t, h_t), h_t)}{\partial c_{k,t}}, \quad \forall j,k \tag{6}$$

under intra-temporal budget constraints $\sum_j c_{j,t} = m_t^*(w_t, h_t)$. This solution leads us to a set of optimal consumption items $\mathbf{c_t^*} = \{c_j^*(w_t, h_t)\}_{j=1}^J$.

It is useful to express the solution of this intra-period problem as $\alpha_j(h_t, m_t^*(w_t, h_t)) = \frac{c_j^*(w_t, h_t)}{m_t^*(w_t, h_t)}$. Hence the solution can be decomposed in two terms:

$$c_j^*(w_t, h_t) = \alpha_j(h_t, m_t^*(w_t, h_t)) m_t^*(w_t, h_t) \tag{7}$$

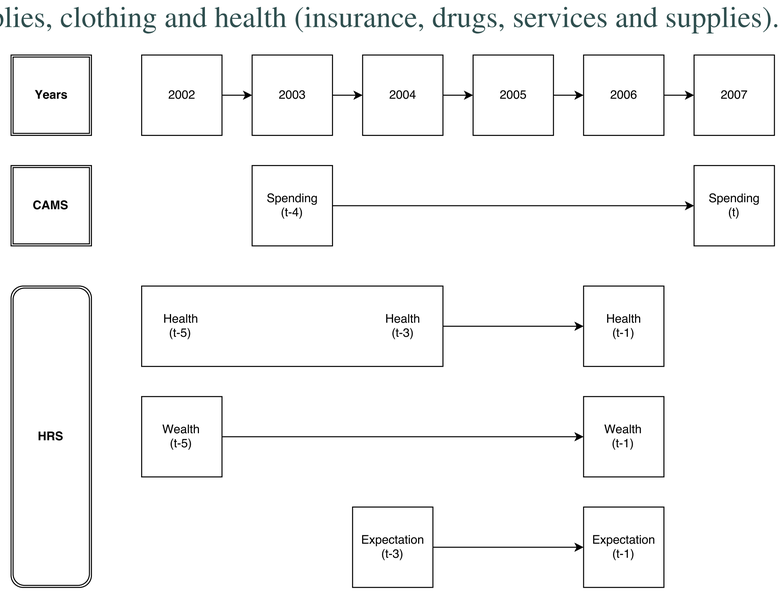
A change in health can have three different effects on consumption items. Taking the total derivative with respect to h we get:

$$\frac{\partial c_j^*(w_t, h_t)}{\partial h_t} = \left(\frac{\partial \alpha_j(h_t, m_t^*)}{\partial h_t} + \frac{\partial \alpha_j(h_t, m_t^*)}{\partial m_t} \frac{\partial m_t^*}{\partial h_t} \right) m_t^* + \alpha_j(h_t, m_t^*) \frac{\partial m_t^*(w_t, h_t)}{\partial h_t} \tag{8}$$

Data

Our primary data source is the *Consumption and Activities Mailout Study* (2003-2015) which is an off-wave component of the *Health and Retirement Study*.

The CAMS questionnaire covers 32 spending items. In what follows, we focus on total and nondurable spending. Out of those nondurable spending items, we construct 9 categories: housing, transportation, utilities, donations (and gifts), food (both at home and away), leisure, household supplies, clothing and health (insurance, drugs, services and supplies).



Results

		ADL	IADL
Aggregates (Median regression)	Total Spending	-0.005	0.089*
	Non-Durable	-0.006	0.095**
	Net Wealth	-0.068	-0.024
Expectation (Tobit)	Bequest $> 10k$	-4.382	-21.844
	Nursing home < 5 years	9.649	-21.304
	Survive 10 years	-18.872**	-41.595***
Wealth Shares (Tobit)	Financial	-0.003	0.076*
	Housing	-0.009	-0.087**
	Transport	0.007	-0.054*
Housing Dynamics (Logit)	Moved	0.041***	0.057***
	Rent Home	0.046*	0.064***
Spending Shares (Tobit)	Housing	-0.005	-0.001
	Transport	0.001	-0.033***
	Utilities	-0.005	0.006
	HH Services	-0.007	0.003
	Health	0.002	0.051***
	Gifts	-0.011	-0.022
	Food	0.008	-0.018
	Leisure	-0.002	-0.006
	Clothing	-0.005	-0.003

Table 1: This table presents estimations where outcome changes over 4 years. (N=2373)

	$\frac{\partial c_j^*(w_t,h_t)}{\partial h_t}$	$= \left(\frac{\partial \alpha_j(h_t,m_t^*)}{\partial h_t} + \frac{\partial \alpha_j(h_t,m_t^*)}{\partial m_t}\frac{\partial m_t^*}{\partial h_t}\right) m_t^*$	$+ \alpha_j(h_t,m^*)\frac{\partial m^*(w_t,h_t)}{\partial h}$
IADL			
Transport	-487 $	-735 $	248 $
Health	1,412 $	1,119 $	293 $

Table 2: This table presents the decomposition of the effect of health change on spending items. (N=2373)

Conclusions

- Given that the likelihood of poor health increases with age, our results and those of recent studies suggest that optimal savings for retirement may not be as large as often calculated simply because the decline in health and its effect on the marginal utility of consumption are not taken into account.

$$\frac{v'(m_t, h_t)}{\underbrace{\sum_h v'(m_{t+1}, h_{t+1} = h) p_h(h_{t+1} = h | h_t, t)}_{\Delta^-}} = R\beta \underbrace{(1 - p_m(h_t, t))}_{\Delta^-}. \tag{9}$$

- Incorporating this mechanism in life-cycle models and estimating such models from longitudinal spending data is an important next step to better understand the insurance and saving needs of the near-elderly in the future.
- There still is a puzzle behind the wealth reallocation from housing and transportation wealth to financial wealth with the onset of IADL limitations:
  - IADLs affect the capability to take care and use these kinds of assets?
  - Source of liquidity to pay the increase of current total spending?
  - Source of liquidity given the increase in future expected health spending with the occurrence of IADL limitations?
- An interesting extension could be to analyse how financial product, such as reverse mortgages, could help liquid constraint household to keep their house if desired.