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The degree of precautionary saving: A reexamination ☆

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Abstract

Extending Dynan's methodology [Dynan, K., 1993. How prudent are consumers? Journal of Political Economy 101, 1104–1113], we show that a significant fraction of the prudence parameter puzzle can be explained by a downward omitted-variable bias. Further, the estimated prudence is substantially higher for liquidity-constrained households.

Keywords: Precautionary saving; Prudence; Liquidity constraints

JEL classification: D12; E21

1. Introduction

Since the seminal work of Dynan (1993, hereafter Dynan), the small estimate of Kimball's (1990) prudence parameter has been one of the puzzles in the literature on consumption behavior. While a growing number of theoretical studies point out the importance of precautionary saving, the existing evidence suggests that precautionary saving motives may not be empirically important.[1] Most of the

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[1] Dynan found the estimated prudence to be in the range of 0.02 and 0.3 and argued that this was *too low to be consistent with widely accepted beliefs about risk aversion*. Merrigan and Mornandin (1996) reported that based on the U.K. data, the estimated prudence would be between 0.78 and 1.33. Notable studies on precautionary saving include Parker and Preston (2005), Gourinchas and Parker (2002), and Banks, Blundell, and Brugiavini (2001).

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Table 1
Descriptive statistics

Variables	Mean		
	All	C	Un-C
Age[a]	41.1 (11.3)	39.9 (11.2)	42.3 (11.7)
Education[a] (%)	83.3	78.6	88.2
Occupation[a] (%)	24.9	18.0	32.4
Consumption[b]	7020 (3468)	6112 (2797)	7989 (3833)
(Consumption growth)^2	0.184 (0.608)	0.157 (0.305)	0.212 (0.814)
Income[b]	15,622 (10,965)	13,873 (9468)	17,486 (12,092)
Financial Assets[b]	6467 (16,175)	315 (458)	13,019 (21,378)
Total wealth[b]	42,661 (54,980)	30,490 (44,527)	55,622 (61,711)
Sample size	1625	838	787

Standard deviations are in parentheses. C denotes *constrained households* and Un-C, *unconstrained households*. *a* represents the head and *b*, the households. Education is measured as the percentage of people in the sample that have studied at least till high school; and occupation, as the percentage of people in the sample who are engaged in managerial/professional occupations. Consumption and income measures (in 1982–84 constant dollars per adult equivalent) are nondurable expenditures and after-tax income, respectively, as defined in Krueger and Perri (2005). Total wealth (in 1982–84 constant dollars per adult equivalent) includes financial assets and property.

previous studies overlook the potential omitted-variable bias caused in the consumption Euler equation estimation by liquidity constraints.[2]

This paper seeks to resolve the puzzle by integrating Dynan's framework with Zeldes' (1989, hereafter Zeldes) model of liquidity constraints. We show that estimating prudence without taking into account liquidity constraints could lead to a nonnegligible omitted-variable bias.

2. Precautionary saving under liquidity constraints

To examine the precautionary saving motives, we estimate relative prudence, considering the liquidity constraints. Following Zeldes, we augment the consumption Euler equation,

$$U'(C_{i,t}) = \left(\frac{1+r}{1+\delta}\right) E_t[U'(C_{i,t+1})] + \lambda_{i,t}, \tag{1}$$

where $C_{i,t}$ is household's consumption, r is interest rate, δ is discount rate, and E_t is the conditional expectation operator. $\lambda_{i,t}$ is the Lagrange multiplier associated with the liquidity constraint.

Then, using the second-order Taylor approximation of $E_t[U'(C_{i,t+1})]$ around $C_{i,t}$ as in Dynan,

$$E_t\left(\frac{C_{i,t+1}-C_{i,t}}{C_{i,t}}\right) = \frac{1}{\sigma}\left(\frac{r-\delta}{1+r}\right) + \frac{\rho}{2} E_t\left[\left(\frac{C_{i,t+1}-C_{i,t}}{C_{i,t}}\right)^2\right] + \widetilde{\lambda}_{i,t}, \tag{2}$$

where σ is the coefficient of relative risk aversion, $-\frac{U''C_{i,t}}{U'}$; ρ is the coefficient of relative prudence, $-\frac{U'''\cdot C_{i,t}}{U''}$; and $\widetilde{\lambda}_{i,t} \equiv -\left(\frac{1+\delta}{1+r}\right)\frac{\lambda_{i,t}}{C_{i,t}U''}$.

[2] See Attanasio and Low (2004), Carroll (2001), and Ludvigson and Paxon (2001).