Discussion

of

A Direct Test of the Buffer Stock Model of Savings

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by

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— The aim of the paper is to study a specific testable implication of the buffer stock model – Carroll (1992, 1997).

— This is critical as previous tests relied on two implications of the buffer stock model: i) consumption tracts income closely, ii) precautionary savings represent an important reason for wealth accumulations.

— But these two predictions are shared by other models of precautionary savings (such as life-cycle models with idiosyncratic risk) as well.

Carroll (QJE, 1997) Buffer Stock Model

— Savings as a buffer stock against income fluctuations

$$E_0 \sum_{t=0}^{T} \beta^t \frac{C_t^{1-\rho}}{1-\rho}, \text{ with } \rho > 0,$$

subject to

$$W_{t+1} = R[W_t - C_t + Y_t],$$

$$Y_{t+1} = P_{t+1} \underbrace{V_{t+1}}_{\text{trans. shock}},$$

and

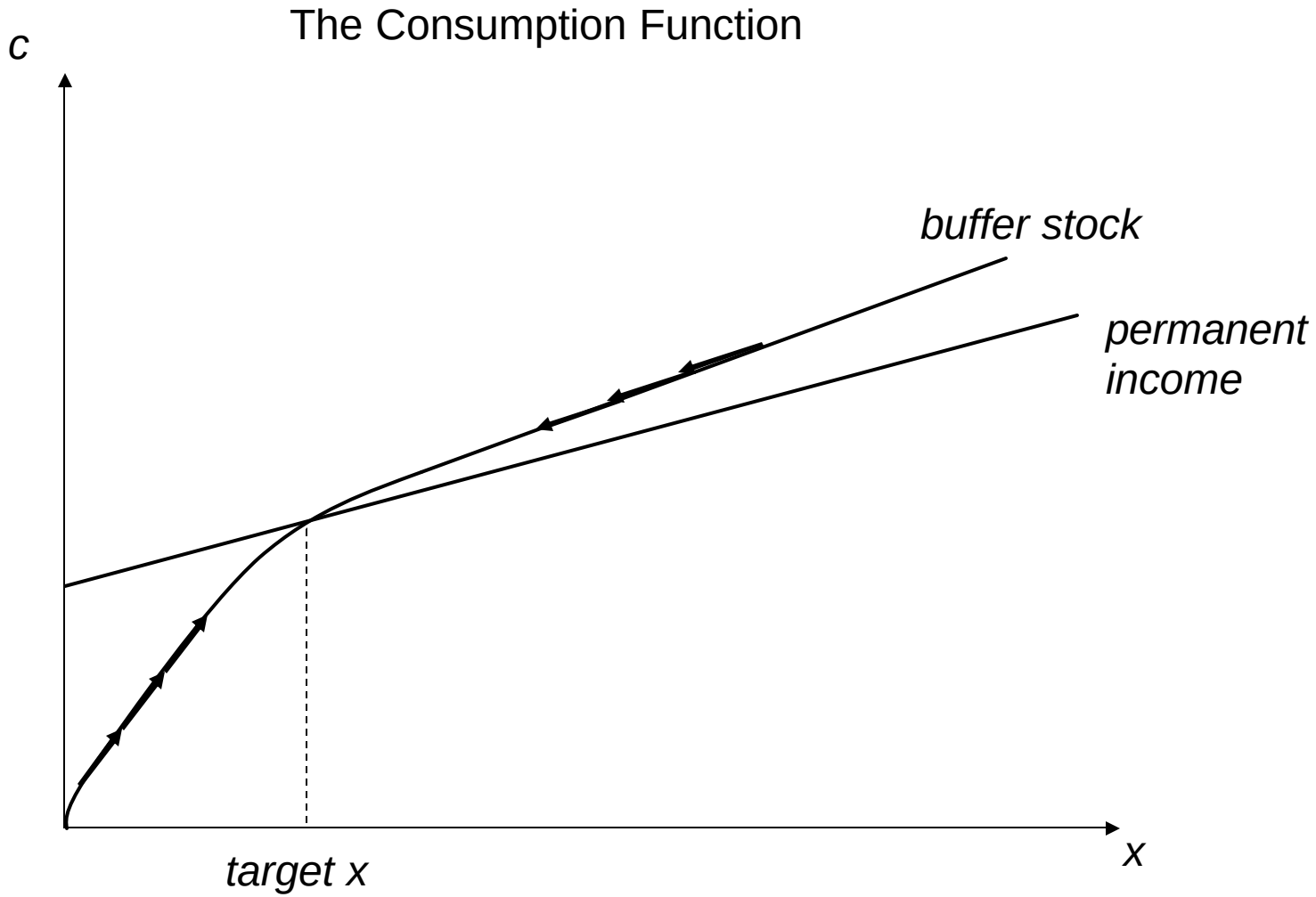
$$P_{t+1} = G P_t \underbrace{N_{t+1}}_{\text{per. shock}}$$

Buffer-Stock Behavior

— Agents are impatient but prudent (there is precautionary motive).

— Optimal solution to this problem is characterized by a target wealth-to-permanent income ratio such that if the current wealth is below this ratio precautionary motive dominates and agents save towards their target wealth; and if the current wealth is above this ratio, then impatience dominates and agents dissave

— The following picture illustrates the point: If the current wealth (x in this picture) is below the target level agents consume less than a permanent income consumer and accumulate wealth, and if the current wealth is above the target level than the agents consume more than a permanent income consumer and reduce wealth. This behavior results in a concave consumption function.


The Consumption Function
c
buffer stock
permanent
income
x
target x

A Proposed Test

— The previous picture illustrates an important implication of the buffer stock model: the covariance between actual and target wealth (wealth gap) and the change in wealth should be negative. If agent is above his target, he will reduce his wealth; and if the agent is below his target, he will increase his wealth.

— Let $W + Y$ be cash-on-hand. Let $x = \frac{W+Y}{P}$, and let x^* be the target

$$COV(x_{ht} - x_h^*, E_{ht}(x_{ht+1} - x_{ht})) < 0,$$

— The authors show that this condition reduces to

$$\theta = \frac{COV(x_{ht} - x_h^*, c_{ht})}{COV(x_{ht} - x_h^*, x_{ht})} > 0 \qquad (**)$$

— Then the question becomes: What do we know about θ theoretically, and what can we say about it empirically?

- What do know about θ theoretically?

— The authors show that if $R > G$, then

$$\theta = \frac{COV(x_{ht} - x_h^*, c_{ht})}{COV(x_{ht} - x_h^*, c_{ht})} > 1 - \frac{G}{R\gamma} > 0, \qquad (*)$$

where $\gamma = e^{\sigma^2_{\ln N}}$.

— Theoretically we expect θ to be positive.

What do know about θ theoretically?

— The condition $R > G$ is not necessary for buffer stock behavior.

— According to Carroll (1997), buffer stock behavior emerges iff

$$\frac{r-\delta}{\rho} + \frac{\rho}{2}\sigma^2_{\ln N} < g - \frac{\sigma^2_{\ln N}}{2}, \qquad (**)$$

where $r \approx \ln(R)$, $-\delta \approx \ln(\beta)$, $g \approx \ln(G)$

Examples

CONDITION FOR BUFFER STOCK BEHAVIOR

r	δ	ρ	$\sigma_{\ln N}$	g	$\frac{r-\delta}{\rho}+\frac{\rho}{2}\sigma^2_{\ln N}$	$g-\frac{\sigma^2_{\ln N}}{2}$	$1-\frac{G}{R\gamma}$
0.01	0.04	2	0.1	0.02	-0.005	0.015	0.000147693
0.01	0.04	2	0.1	0.03	-0.005	0.025	-0.009654781
0.01	0.04	2	0.1	0.01	-0.005	0.005	0.009950166

— Theoretically, θ can be negative, and the condition for buffer stock behavior is still satisfied.

— Hence, theoretically we do not know much about θ.

Simulations

— The authors also present simulations that show that θ is positive and indeed quite large.

— In these simulations differences in x^* are generated by differences in β.

— However, simulations are all done under $R > G$. Is this necessary?

— Given that we do not much about θ theoretically, simulations should be more extensive.

Data

— What do we know about θ empirically?

— Question in 2002 and 2004 Italian Surveys of Household Income and Wealth (SHIW): "People save in various ways (depositing money in a bank account, buying financial assets, property, or other assets) and for different reasons. A first reason is to prepare for a planned event, such as the purchase of a house, children's education, etc. Another reason is to protect against contingencies, such as uncertainty about future earnings or unexpected outlays (owing to health problems or other emergencies). About how much do you think you and your family need to have in savings to meet such unexpected events?"

— It turns out to be quite a lot: about 55,000 Euro.

Data

— Similar question is in Survey of Consumer Finances (SCF).

— The numbers for the US from SCF is much lower: $5000-$10000, Kennickell and Lusardi (2005).

— Looks like precautionary savings are important for Italy.

— Furthermore, incomes in Italy seems to quite uncertain. Japelli and Pistaferri (JEEA, 2006) estimate variance of permanent and transitory income shocks to be 0.0256 and 0.0784. Comparable numbers for the US, taken from Gourinchas and Parker (Econometrica 2002) are 0.0212 and 0.044.

Results

— With the simulated data the values for θ are high— 0.4 to 0.7.

— The estimated value of θ is very low — -0.001 to 0.023.

— Theoretically such low (negative or positive) θ values are possible.

— Hence, empirical results contradict simulations.

Results

— Still, empirical results are provocative.

— For groups (such as young and entrepreneurs) for whom the precautionary savings should be important, the estimated θ values even lower.

— What is going on?

Simulations Again – Target Wealth in a Life-Cycle Model

— The authors generate differences in target wealth by differences in βs. This is not necessary.

— Gourinchas and Parker (2000) estimate a life-cycle model with labor income uncertainty and conclude that: "Young consumers start as buffer stock agents. Around age 40, the typical household starts accumulating liquid assets for retirement and its behavior mimics more closely that of a certainty equivalent consumer."

— Target cash-on-hand levels simulated by Gourinchas and Parker (2000). Very similar until age 36 and then start rising sharply. See following pictures.

— Life-cycle concerns affects behavior of agents as early age 36.

— May be the authors should focus on simulations from a life-cycle model.

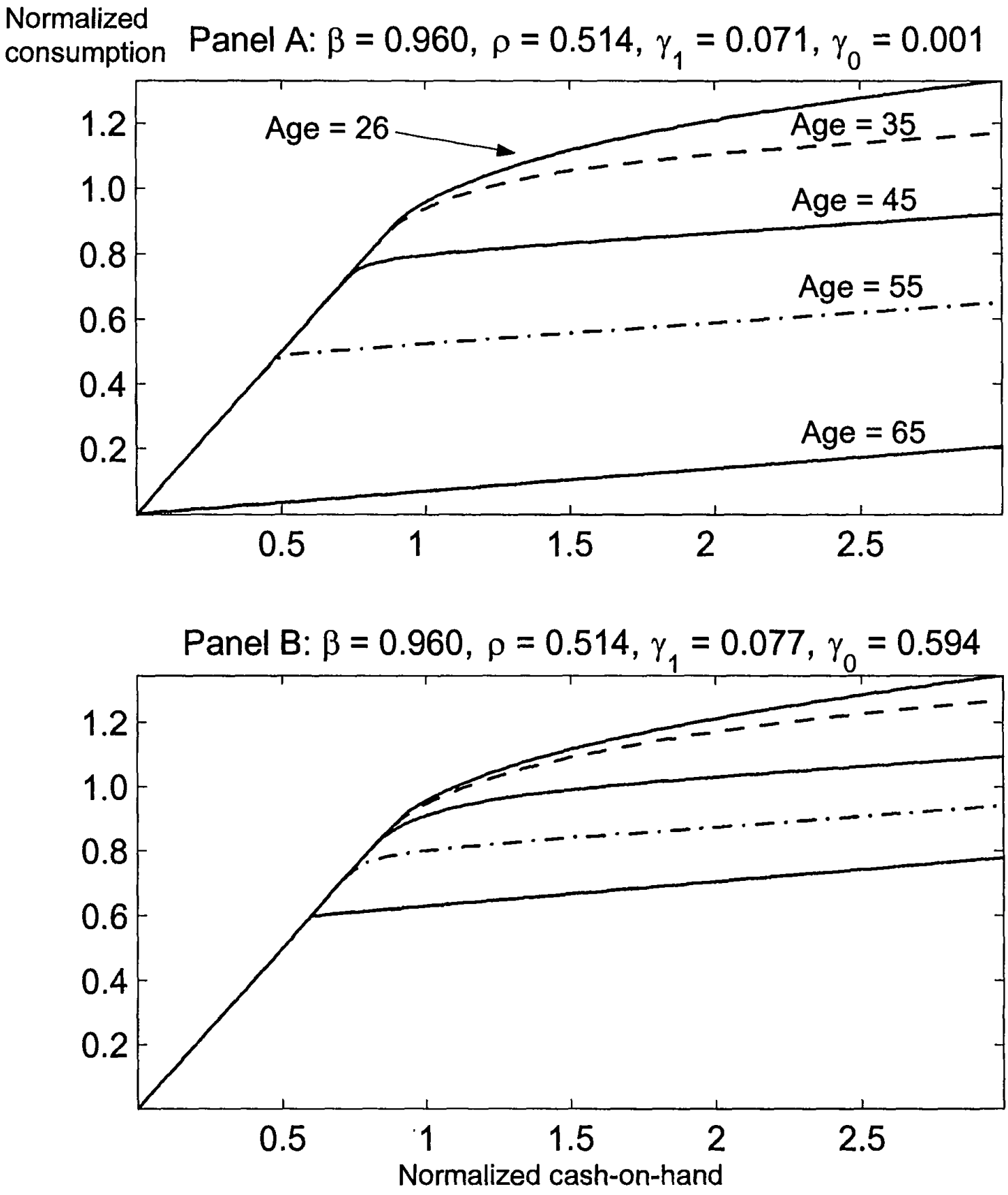


FIGURE 1.—A tale of two households.

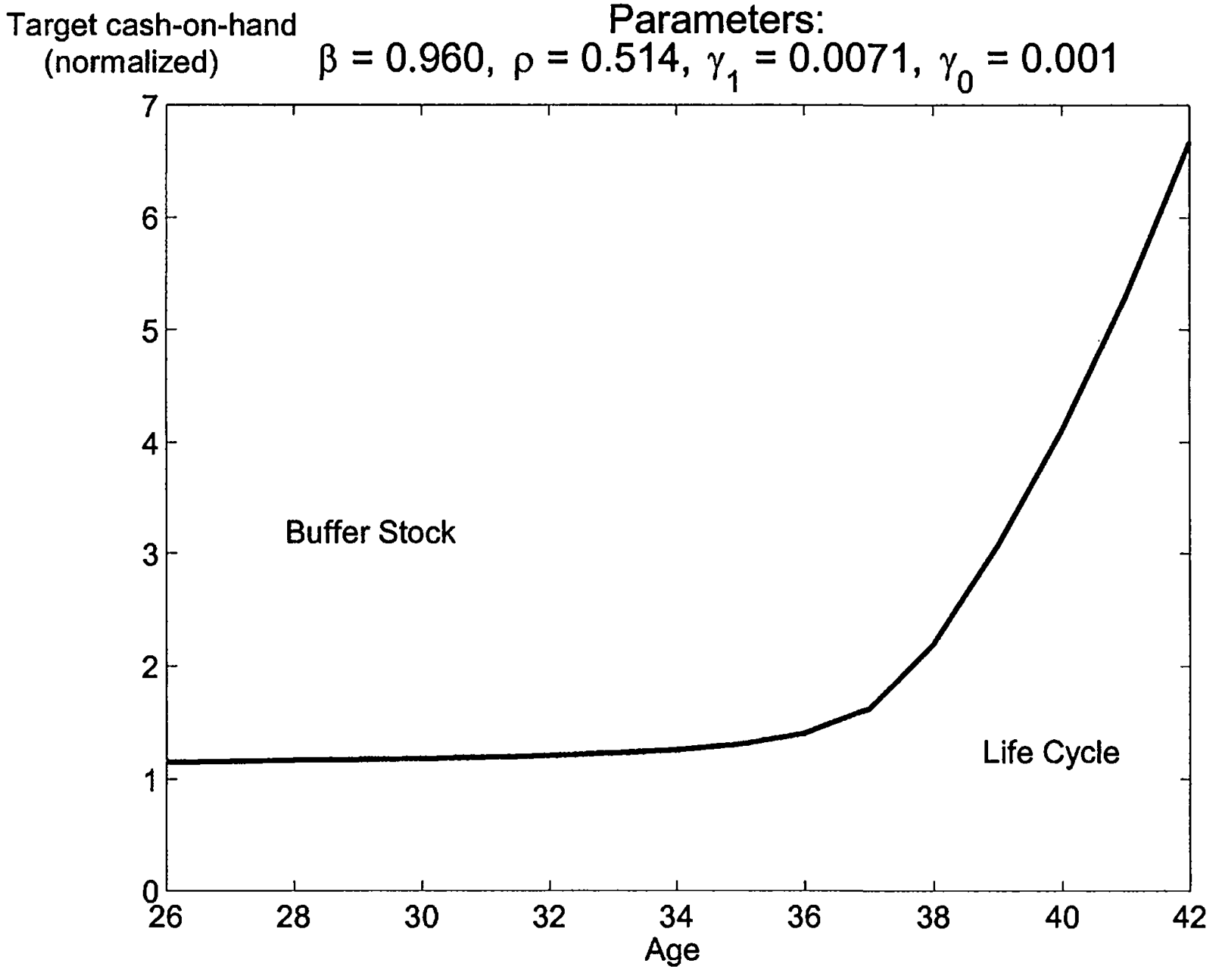


FIGURE 6.—Normalized target cash-on-hand by age.

Target Wealth in the data

— Does the question in SHIW capture the target wealth for different ages?

— The question mentions housing etc. Is this an issue?

— Kennickell and Lusardi (2005) interpret answers as the amount of precautionary savings.

— How does target wealth change for same individuals by age? In the data target wealth levels are much very similar

— Why not look at consumption functions in cross section?

Young Italians

— Agents start accumulating wealth early on — more patient than buffer stock consumers.

— No risk and just life-cycle savings?

— Can data on consumption fluctuations help?

— Why not look at data by wealth levels?

— Wealthy permanent income types and poor buffer stock types.

— Figure 4 might be driven by rich housheolds who actually hold wealth.

Conclusions

— Very interesting results.

— Do we have a good measure of target wealth in the data?

— Should we take life-cycle aspect more seriously in the simulations to be able to look at the data?