PRECAUTIONARY SAVINGS, LIQUIDITY CONSTRAINTS, AND SELF-CONTROL

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Three Important Ideas

- Precautionary Saving
- Liquidity Constraints
- Self-Control Problems
Certainty Equivalence

- Suppose for simplicity $\beta(1 + r) = 1$
- Consumption Euler equation:
  \[ U'(C_t) = E_t U'(C_{t+1}) \]
- With quadratic utility:
  \[ C_t = E_t C_{t+1} \]
- This implies certainty equivalence:
  - $C_t$ depends only on $E_t C_{t+1}$ not $\text{var}_t(C_{t+1})$ (or any higher moments)
Certainty Equivalence

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- Consumption Euler equation:

$$U'(C_t) = E_t U'(C_{t+1})$$

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- Very extreme model:
  - Savings behavior unaffected by uncertainty!!
  - Consumption smoothing and intertemporal substitution only forces affecting savings
    (same thing for linearized or log-linearized models)
With quadratic utility, utility cost of given variance of consumption independent of the level of consumption
- Amount of curvature of utility independent of level
- Jensen’s inequality term independent of the level

But marginal utility falls with level of consumption

Thus, with quadratic utility, consumers are willing to pay more to avoid a given amount of uncertainty (particular dollar coin toss) the richer they are

Quadratic utility implies increasing absolute risk aversion
**Common Utility Functions**

- **Constant Relative Risk Aversion (CRRA):**

  \[ U(C) = \begin{cases} \frac{C^{1-\gamma} - 1}{1-\gamma} & \text{if } \gamma \neq 1 \\ \log C & \text{if } \gamma = 1 \end{cases} \]

  Relative Risk Aversion \( = -\frac{U''(C)C}{U'(C)} = \gamma \)

- **Constant Absolute Risk Aversion (CARA):**

  \[ U(C) = -\frac{\exp(AC)}{A} \]

  Absolute Risk Aversion \( = -\frac{U''(C)}{U'(C)} = A \)
Risk Aversion in Reality

- Increasing absolute risk aversion completely unrealistic

- Implications for portfolio allocation:
  - CRRA: Constant share in risky assets
  - CARA: Constant dollar amount in risky assets
  - IARA: Decreasing dollar amount in risky assets as wealth increases

- In reality, richer people allocate larger share of wealth to risky assets

- Suggests decreasing relative risk aversion (DRRA) (CRRA not such a bad approximation)

See Gollier (2001, ch 2.) for more detailed discussion of various forms of risk aversion.
Curvature of utility almost surely falls as consumption rises:

\[ U'''(C_t) > 0 \]

What does this imply about savings?

Precautionary Savings
Precautionary Savings

- Curvature of utility almost surely falls as consumption rises:
  \[ U'''(C_t) > 0 \]

- What does this imply about savings?

- With \( U'''(C_t) > 0 \), \( U'(C_t) \) is convex

- If \( C_t = E_t C_{t+1} \), then
  - \( U'(C_t) < E_t U'(C_{t+1}) \) (since \( U'(C_t) = U'(E_t C_{t+1}) < E_t U'(C_{t+1}) \))
  - Marginal reduction in \( C_t \) (increase in saving) increases utility

- This extra saving relative to certainty equivalent case is called precautionary saving
Source: Romer (2019). 50-50 chance of \(C_H\) and \(C_L\).
Source: Romer (2019)
**Prudence**

**Definition:** (Kimball, 1990) An agent is **prudent** if adding an uninsurable zero-mean risk to their future wealth raises their optimal savings.

**Proposition:** (Leland, 1968) An agent is prudent if and only if the marginal utility of future consumption is convex.
LIQUIDITY CONSTRAINTS

Figure 2: Household consumption and income over the life cycle.

Consumption (raw) and consumption (smoothed) are presented in Figure 2 along with income profiles for the entire sample when family size is held constant over the life-cycle. Even after correcting for the effects of cohort, time, and family, both profiles are still hump shaped and track each other early in life. Consumption lies above income over the late twenties. Given that the CEX wealth data and better household wealth surveys show modest increases in liquid wealth over these ranges, this feature seems likely due to misreporting of income or consumption. One possibility is underreporting the assistance that is provided by intergenerational transfers early in life. After these first few years, consumption rises with income from age 30 to age 45, when consumption drops significantly below income. This tracking is however a lot less than is observed in profiles constructed by simply averaging cross-sections because we control for changes in family size and cohorts effects.

Finally, we put all data into real 1987 dollars using the Gross Domestic Product implicit price deflator for personal consumption expenditures. It is important not to use different deflators for income and consumption. This could break the relationship between cash on hand and consumption in nominal terms, which is the relationship predicted by the buffer-stock theory.

Source: Gourinchas-Parker (2002). Takes out cohort and time effects.
Liquidity Constraints

- Consumption smoothing over the life-cycle likely involves substantial borrowing early in life.
- Simple PIH/LCH model assumes people can borrow (unsecured) at same rate as they can save.
- Highly unrealistic:
  - Most household borrowing is secured (e.g., mortgages, car loans).
  - Interest rates on car loans and even mortgages substantially higher than on savings accounts.
  - Interest rates on unsecured consumer lending (i.e., credit cards) extremely high (~20%).
  - Limits on unsecured borrowing beyond which can’t go at any rate.
Two effects of liquidity constraints:

1. Less borrowing when they bind

2. Less borrowing even when they don’t bind because they may bind in the future
   - Bad shock tomorrow may cause low consumption due to binding liquidity constraint at that point
   - Consumer saves today to “self-insure” against this future bad shock
Liquidity constraints and prudence cause households facing uninsurable income risk to engage in buffer stock saving (i.e., self-insurance)

Other sources of saving:
- **Life-cycle saving** to smooth consumption over the life-cycle relative to life-cycle profile of income
- Saving due to **patience/impatience**. If \( \frac{1}{\beta} \neq (1 + r) \) household will tilt consumption profile (down if impatient, up if patient)
- Saving due to **intertemporal substitution**. If interest rates are temporarily high, consumers save more to take advantage of this
HOW MUCH BUFFER STOCK SAVING?

Depending crucially on $\beta(1 + r)$

- If $\beta(1 + r) = 1$:
  - Households will eventually save themselves out of constraint
  - I.e., save enough that they will eventually never hit constraint
  - At that point, full consumption smoothing

- If $\beta(1 + r) < 1$
  - Households sufficiently impatient that they don’t eventually save themselves out of the constraint
  - Finite amount of buffer stock savings
  - Lack of full consumption smoothing even in the long run

- If $\beta(1 + r) > 1$: Asset holdings explode in the long run
Households maximize

$$
E_0 \sum_{t=0}^{\infty} \beta^t \frac{C_t^{1-\gamma}}{1-\gamma},
$$

subject to

$$
W_{t+1} = R(W_t + Y_t - C_t)
$$

$$
Y_t = P_t V_t
$$

$$
P_t = P_{t-1} N_t
$$

where $V_t$ and $N_t$ are i.i.d. log-normal random variables.

- $R$ is given exogenously (partial equilibrium)
- Household income shocks are uninsurable
- In some versions, household faces borrowing constraint $W_t \geq W$

Problem Sets 8 and 9 ask you to solve two versions of this model.

Zeldes-Deaton-Carroll argue that model helps explain:
- High MPC out of transitory windfalls
- That consumption tracks income over the life-cycle
  (need impatient households for this)

Sometimes called the “buffer stock model”

General equilibrium version called Bewely-Aiyagari-Hugget model
(i.e., interest rate is endogenous)
The first example uses distribution #2, the random walk/i.i.d. process. The time horizon is 15 periods, and the coefficient of relative risk aversion is set equal to three. Consumption as a function of initial financial assets is plotted as the middle line in Figure II. Both initial income and expected income in all future periods are equal to 100. The results, especially at low levels of assets, are quite striking. First, notice that the slope of the curve, which is equal to the marginal propensity to consume out of a transitory change in income, is considerably larger than that predicted by certainty equivalence. For example, a household with two years worth of expected income in the form of assets would have an MPC of over twice that which would be predicted by a certainty or certainty-equivalence model. A family with one year's worth of expected income as assets would have an MPC seven times as great as under CEQ. This fully optimizing unconstrained household exhibits dramatic "excess sensitivity" relative to the certainty-equivalence model.

Source: Zeldes (1989)
Basic Zeldes-Deaton-Carroll model very stylized
Is buffer stock saving important quantitatively?
Add:
  - Realistic life-cycle income process with retirement
  - Longevity risk
  - Health expenses
  - Taxes and government transfer programs
Figure 3a

Average Consumption and Earnings by Age

No High School Degree

Cons. all uncertain ($1 floor)

Earnings

Cons. all certain

Earnings

Cons. only lifetime uncertain


Consumption does not equal earning for young in certainty case because of medical expenses.

$\gamma = 3, \delta = .03$
Figure 2a
Average Assets by Age
No High School Degree

all uncertain ($1 floor)

all uncertain ($7000 floor)

all certain

only lifetime uncertain

gamma = 3, delta = 0.03

Precautionary savings and liquidity constraints:

- Yield life-cycle consumption profile the tracks income substantially
- Can contribute substantially to asset accumulation
Go one step further than Hubbard-Skinner-Zeldes 94

Estimate the preference parameters
Household consumption and income over the life cycle.

Source: Gourinchas-Parker (2002)
### TABLE III
**STRUCTURAL ESTIMATION RESULTS**

<table>
<thead>
<tr>
<th>MSM Estimation</th>
<th>Robust Weighting</th>
<th>Optimal Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discount Factor ($\beta$)</td>
<td>0.9598</td>
<td>0.9569</td>
</tr>
<tr>
<td>S.E.(A)</td>
<td>(0.0101)</td>
<td></td>
</tr>
<tr>
<td>S.E.(B)</td>
<td>(0.0179)</td>
<td>(0.0150)</td>
</tr>
<tr>
<td>Discount Rate ($\beta^{-1} - 1$)(%)</td>
<td>4.188</td>
<td>4.507</td>
</tr>
<tr>
<td>S.E.(A)</td>
<td>(1.098)</td>
<td></td>
</tr>
<tr>
<td>S.E.(B)</td>
<td>(1.949)</td>
<td>(1.641)</td>
</tr>
<tr>
<td>Risk Aversion ($\rho$)</td>
<td>0.5140</td>
<td>1.3969</td>
</tr>
<tr>
<td>S.E.(A)</td>
<td>(0.1690)</td>
<td></td>
</tr>
<tr>
<td>S.E.(B)</td>
<td>(0.1707)</td>
<td>(0.1137)</td>
</tr>
<tr>
<td>Retirement Rule:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\gamma_0$</td>
<td>0.0015</td>
<td>5.68 $10^{-6}$</td>
</tr>
<tr>
<td>S.E.(A)</td>
<td>(3.84)</td>
<td></td>
</tr>
<tr>
<td>S.E.(B)</td>
<td>(3.85)</td>
<td>(16.49)</td>
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<tr>
<td>$\gamma_1$</td>
<td>0.0710</td>
<td>0.0613</td>
</tr>
<tr>
<td>S.E.(A)</td>
<td>(0.1215)</td>
<td></td>
</tr>
<tr>
<td>S.E.(B)</td>
<td>(0.1244)</td>
<td>(0.0511)</td>
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<tr>
<td>$\chi^2$(A)</td>
<td>175.25</td>
<td></td>
</tr>
<tr>
<td>$\chi^2$(B)</td>
<td>174.10</td>
<td>185.67</td>
</tr>
</tbody>
</table>

*Note:* MSM estimation for entire group. Standard errors calculated without (A) and with (B) correction for first stage estimation. Cell size is 36,691 households. The last row reports a test of the overidentifying restrictions distributed as a Chi-squared with 36 degrees of freedom. The critical value at 5% is 50.71. Efficient estimates are calculated with a weighting matrix $\widehat{\Omega}$ computed from the robust estimates.

Source: Gourinchas-Parker (2002)
**RESULTS**

- Reasonable discount rate of 4%
  (Carroll-Samwick 97 had suggested larger rates were needed)

- Reasonable IES of about 2 (sensitive to weighting matrix)

- Reasonable MPC in retirement of 7% per year
 Thousands of 1987 dollars

Panel A: Baseline Estimation
\[ \beta = 0.960, \quad \rho = 0.514, \quad \gamma_1 = 0.071, \quad \gamma_0 = 0.001 \]

Panel B: Various \( \beta \)

\( \beta = 0.95 \)
\( \beta = 0.97 \)

Source: Gourinchas-Parker (2002)
Level of cash on hand at age $t$ that is expected to remain unchanged:

$$\bar{x}_t = E_t[x_{t+1} | x_t = \bar{x}_t]$$

- If $x_t > \bar{x}_t$ households dissave on average
- If $x_t < \bar{x}_t$ households build up assets on average
Target cash-on-hand
(normalized) Parameters:

\[ \beta = 0.960, \ \rho = 0.514, \ \gamma_1 = 0.0071, \ \gamma_0 = 0.001 \]

Buffer Stock

Life Cycle

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

Source: Gourinchas-Parker (2002). Cash-on-hand normalized by permanent income.
Define life-cycle consumption as consumption under complete insurance markets

Use this concept to construct:

- Life-cycle savings / wealth
- Buffer-stock savings / wealth
life-cycle consumption:

\[ S_{fC} \left( \frac{W_{1} - W}{R} \right) = \frac{(R - 1)}{RW_{tc}} + Y_{t}L_{C_{i-t}} \]

Precautionary saving is the complement of life-cycle saving. The first panel of Figure 7 plots the precautionary and life-cycle liquid saving of the average household. Given the estimated discount rate and the profile of expected income, young consumers facing no income risk would like to borrow large amounts, so life-cycle saving is negative early in life. Young households in fact hold a positive buffer stock of wealth in response to income risk, so that precautionary saving is positive early in life. In the early to mid forties, in accordance with our previous discussion, life-cycle saving becomes larger than precautionary saving. Households begin to build their liquid wealth for retirement purposes. As asset levels increase, the expected variance of consumption declines, decreasing the precautionary saving motive. Since households that face income uncertainty save more early in life due to risk, they are able to consume more and save less when older, leading to negative precautionary saving late in life. This discussion

 Thousands of 1987 dollars

Panel A: Life Cycle and Buffer Saving

Life Cycle Saving

Buffer Saving

25 30 35 40 45 50 55 60 65

Panel B: Life Cycle and Buffer Wealth

400

Total Wealth / Buffer Wealth

300

100

0

-100

25 30 35 40 45 50 55 60 65

Age

FIGURE 7.—The role of risk in saving and wealth accumulation.

Source: Gourinchas-Parker (2002)
Can uninsurable income risk explain comovement of consumption and income over the life-cycle?
Can uninsurable income risk explain comovement of consumption and income over the life-cycle?

Yes!

Households are impatient
(want downward sloping consumption profiles)

Consumption constrained by income early in life

Households save for retirement later in life
Standard incomplete markets models can’t match large estimated spending responses of consumption to tax rebates.

Argue that incorporating illiquid wealth into model is key:
- Liquid assets (-1.5% real return)
- Illiquid asset (2.3% real return + 4% service flow)
- Unsecured debt (6% real interest rate)

Two types of hand-to-mouth agents:
- Poor hand-to-mouth (no illiquid wealth, no liquid wealth)
- Wealthy hand-to-mouth (have illiquid wealth, no liquid wealth)

This model generates much higher rebate responses.
Common for people to display dissatisfaction with their choices

- I am not saving enough for retirement
- I eat too much and exercise too little
- I spend too much time surfing the internet and work too little

One reaction:

- This is stupid. What you do are you actual preferences
- What you say are some imagined idealized preferences
- Everyone says they want to be fit and work really hard
- But the costs of achieving these goals actually outweigh the benefits for many people
An alternative reaction:

- Consumer regret is due to self-control problems
- Arises due to present biased preferences that give rise to preference reversals
An alternative reaction:

- Consumer regret is due to **self-control problems**
- Arises due to present biased preferences that give rise to preference reversals

Consider the following choice for a worker:

1. 15 minute break today
2. 20 minute break tomorrow
An alternative reaction:

- Consumer regret is due to self-control problems
- Arises due to present biased preferences that give rise to preference reversals

Consider the following choice for a worker:

1. 15 minute break today
2. 20 minute break tomorrow

Now consider this choice:

1. 15 minute break in 100 days
2. 20 minute break in 101 days
An alternative reaction:

- Consumer regret is due to self-control problems
- Arises due to present biased preferences that give rise to preference reversals

Consider the following choice for a worker:

1. 15 minute break today
2. 20 minute break tomorrow

Now consider this choice:

1. 15 minute break in 100 days
2. 20 minute break in 101 days

Choosing option 1 from the first set but option 2 from the second set indicates time-discounting that is not independent of horizon
Figure 1
Discounting as a Function of Time Delay and Money Amount.

Source: Benzion et al. (1989).

Source: Loewenstein and Thaler (1989). Based on experiments where subjects are asked how much they need to be compensated to delay receiving a reward.
Hyperbolic Discounting

- Exponential discounting:
  - Discount function: $\beta^t$: 1, $\beta$, $\beta^2$, $\beta^3$, etc.
  - Discount rate independent of horizon
  - Degree of patience independent of horizon

- Hyperbolic discounting:
  - Discount function: $1/t$ or $1/(1 + \alpha t)$ or $1/(1 + \alpha t)^{-\gamma/\alpha}$
  - Quasi-hyperbolic discount function: $\beta^{\delta t}$: 1, $\beta \delta$, $\beta \delta^2$, $\beta \delta^3$, etc.
  - Non-constant rate of discounting
  - More impatient about short run than long run
Figure 1

Discount Functions

Exponential: $\delta^T$, with $\delta = 0.944$; hyperbolic: $(1 + \alpha \tau)^{-\gamma/\alpha}$, with $\alpha = 4$ and $\gamma = 1$; and quasi-hyperbolic: $\{1, \beta \delta, \beta \delta^2, \beta \delta^3, \ldots\}$, with $\beta = 0.7$ and $\delta = 0.957$.

Source: Angeletos et al. (2001)
TIME-CONSISTENT PREFERENCES

- Suppose an agent makes a state-contingent plan at time 0 about optimal current and future actions
- But when the future arrives, the agent can reoptimize
- Will they want to change their plan?
Suppose an agent makes a state-contingent plan at time 0 about optimal current and future actions. But when the future arrives, the agent can reoptimize. Will they want to change their plan?

If the agent discounts future utility exponentially, then they will not change their choices even if able to reoptimize. Their preferences are time consistent (aka dynamically consistent).
If an agent’s discount function in not exponential, then they will want to change their plan when allowed to reoptimize at a later date.

Their preferences are time inconsistent (aka dynamically inconsistent).

Hyperbolic and quasi-hyperbolic preferences are time inconsistent.
Consider following choice:
- Small reward $S$ at time $t_1$
- Bigger reward $B$ at a later time $t_2$

Suppose agent has hyperbolic preferences

Plot present utility from each option as a function of time
Figure 2
Non-Exponential Discounting.

Source: Ainslie (1975).

Hyperbolic discounting can explain the following type of behavior:
- On Monday: “I’ll work hard tomorrow.”
- On Tuesday: “I’ll work hard tomorrow.”
- Etc.

People with hyperbolic preferences want instant gratification today but simultaneously want to make patient investments tomorrow.
Intrapersonal Strategic Conflict

- Useful to think of a person as having different selves, one for each point in time.
- Earlier selves wish to force later selves to act patiently
- Later selves maximize their own preferences (which are different)
- Household problem becomes a game between different selves
**Two Types of Hyperbolics**

- **Sophisticates**: Understand that future selves will want to act differently
  - Want to constrain actions of future selves
  - Want access to commitment devices

- **Naifs**: Act under false belief that future selves will carry out current plan
  - Helps explain procrastination among other things
  (Akerlof, 1991; O’Donoghue and Rabin, 1999)
**Hyperbolic Discounting and Consumption**

- Key references:
  - Angeletos et al. (2001), Laibson, Repetto, Tobacman (2003), Laibson, Lee, Maxted, Repetto, Tobacman (2023, but originally ca. 2001)

- Build sophisticated life-cycle consumption savings model

- Compare model with exponential and hyperbolic discounting

- Ask whether hyperbolic discounting helps explain the data
  (Baseline case is naifs, but sophisticates give similar conclusions)
Hyperbolic Discounting and Consumption

- Model very similar to Kaplan-Violante (2014) (liquid assets, illiquid assets, credit card borrowing)
- Conclusions radically different
- Laibson et al. (2023) estimate: $\beta = 0.50$ and $\delta = 0.99$
- Kaplan-Violante (2014) calibrate $\beta = 0.941$
Main tension is how to explain simultaneous:
- Credit card borrowing at high interest
- Accumulation of illiquid assets

Main difference: Assumptions about interest on credit card debt
- Laibson et al. (2023): 12% real credit card interest rate (data)
- Kaplan-Violante (2014): 6% real credit card interest rate (calibrated)

Exponential model can explain facts if credit card interest rate is 6% (return on illiquid asset is similarly high inclusive of service flow) but not if credit card interest rate is 12%
Many households have revolving credit card debt and positive liquid assets.

Kaplan-Violante:
- Target a fraction of credit card borrowers of 26%
- Compromise between fraction with negative net liquid wealth and fraction actually borrowing on credit cards

Laibson et al.:
- Target fraction of credit card borrowers of about 75% (higher for young, somewhat lower for old)

Agents with hyperbolic discounting can simultaneously display highly patient and impatient behavior (accumulate illiquid wealth and borrow on credit cards)
Figure 2
Simulated Mean Income and Consumption

Source: Angeletos et al. (2001).
Figure 4
Mean Illiquid Assets of Households with Exponential and Hyperbolic Discount Functions

Source: Angeletos et al. (2001).
Figure 5
Mean Liquid Assets and Liabilities

Source: Angeletos et al. (2001).
### Table 1
Percentage of Households with Liquid Assets Greater than One Month of Income

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Simulated Data</th>
<th>Survey of Consumer Finances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exponential</td>
<td>Hyperbolic</td>
</tr>
<tr>
<td>ALL AGES</td>
<td>0.73</td>
<td>0.40</td>
</tr>
<tr>
<td>20–29</td>
<td>0.52</td>
<td>0.34</td>
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<tr>
<td>30–39</td>
<td>0.72</td>
<td>0.39</td>
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<tr>
<td>40–49</td>
<td>0.72</td>
<td>0.38</td>
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<tr>
<td>50–59</td>
<td>0.76</td>
<td>0.43</td>
</tr>
<tr>
<td>60–69</td>
<td>0.91</td>
<td>0.42</td>
</tr>
<tr>
<td>70+</td>
<td>0.77</td>
<td>0.46</td>
</tr>
</tbody>
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**Sources:** Authors’ simulations and 1995 SCF.

**Notes:** The table reports the fraction of households who hold more than a month’s income in liquid wealth. Definition 1 includes cash, checking and savings accounts. Definition 2 includes definition 1 plus money market accounts. Definition 3 includes definition 2 plus call accounts, CDs, bonds, stocks and mutual funds.

Source: Angeletos et al. (2001).
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<th>Definition 2</th>
<th>Definition 3</th>
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<td>0.43</td>
<td>0.52</td>
</tr>
<tr>
<td>20-29</td>
<td>0.52</td>
<td>0.34</td>
<td>0.18</td>
<td>0.19</td>
<td>0.26</td>
</tr>
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<td>0.77</td>
<td>0.46</td>
<td>0.62</td>
<td>0.71</td>
<td>0.78</td>
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Sources: Authors' simulations and 1995 SCF.
Notes: The table reports the fraction of households who hold more than a month's income in liquid wealth. Definition 1 includes cash, checking and savings accounts. Definition 2 includes definition 1 plus money market accounts. Definition 3 includes definition 2 plus call accounts, CDs, bonds, stocks and mutual funds.

Table 2
Share of Assets in Liquid Form

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<tr>
<th>Age Group</th>
<th>Exponential</th>
<th>Hyperbolic</th>
<th>Definition 1</th>
<th>Definition 2</th>
<th>Definition 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL AGES</td>
<td>0.51</td>
<td>0.41</td>
<td>0.08</td>
<td>0.10</td>
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<tr>
<td>20-29</td>
<td>0.97</td>
<td>0.86</td>
<td>0.13</td>
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<td>0.46</td>
<td>0.09</td>
<td>0.10</td>
<td>0.14</td>
</tr>
<tr>
<td>40-49</td>
<td>0.35</td>
<td>0.24</td>
<td>0.06</td>
<td>0.07</td>
<td>0.10</td>
</tr>
<tr>
<td>50-59</td>
<td>0.20</td>
<td>0.13</td>
<td>0.04</td>
<td>0.05</td>
<td>0.09</td>
</tr>
<tr>
<td>60-69</td>
<td>0.27</td>
<td>0.12</td>
<td>0.09</td>
<td>0.10</td>
<td>0.20</td>
</tr>
<tr>
<td>70+</td>
<td>0.57</td>
<td>0.56</td>
<td>0.09</td>
<td>0.12</td>
<td>0.24</td>
</tr>
</tbody>
</table>

Sources: 1995 SCF and authors’ simulations.
Notes: Asset share is liquid assets divided by total assets—liquid assets plus illiquid assets. The three different definitions used for liquid assets are the same as in Table 1. Three complementary definitions are used for illiquid assets. Illiquid assets include money market accounts, call accounts, CDs, bonds, stocks, and mutual funds if these assets were not included in the relevant liquid asset definition. In addition, illiquid assets include IRAs, defined contribution plans, life insurance, trusts, annuities, vehicles, home equity (net of mortgage), real estate, business equity, jewelry, furniture, antiques, and home durables.

Source: Angeletos et al. (2001).