Two Papers About the MPC!
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Chris Carroll
These are my views and not those of anybody else at CFPB

May 20, 2015
Why Do We Care About the MPC?
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- Idea: Respond with big ‘stimulus’ tax cuts

\[ \text{In simplest Keynesian liquidity trap model: If} \]
\[ \bar{c} = c + (y - \tau) \kappa \]

\[ \Rightarrow \text{multiplier on } \Delta \tau = \frac{1}{1 - \kappa} - 1 \]

\[ \text{If } \kappa = 0.75 \text{ then multiplier is } 4 - 1 = 3 \]

\[ \text{Some micro estimates of } \kappa \text{ are this large} \]

\[ \text{If } \kappa = 0.05 \text{ then multiplier is only } \approx 0.05 - 2007-vintage \text{ DSGE models mostly implied } \kappa \in (0.00, 0.05) \]
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What, If Anything, Is ‘the MPC’?

Friedman [1957]:

\[ y_t = p_t + \Theta_t \]
\[ c_t = p_t \]

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we should find \( 0 < \alpha < 1 \) depending on extent to which people perceive \( \Delta y_{t+1} \) as transitory or permanent
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$0 < \alpha < 1:$
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0 < \alpha < 1: Not Exactly a Triumph

Problem:
- Friedman’s PIH is not really about \( r \)
If \( u(c) = (1 - \gamma)^{-1}c^{1-\gamma} \), and \( r \) is believed to be constant forever, then perfect foresight infinite horizon model PerfForesightCRRA says

\[
c = \left( b_t + \rho \left( \frac{1 + r}{r} \right) \right)^o \left( r - \gamma^{-1}(r - \theta) \right)^k
\]

where \( o \) is 'overall wealth' (human plus nonhuman), and \( k \) is the amount that the model says is OK to spend.
Standard Theory About Response to r ...

If $u(c) = (1 - \gamma)^{-1} c^{1-\gamma}$, and r is believed to be constant forever, then perfect foresight infinite horizon model PerfForesightCRRA says

$$c = \left( b_t + p \left( \frac{1 + r}{r} \right) \right)^{\kappa} \left( r - \gamma^{-1}(r - \theta) \right)$$

$$= o\kappa$$

where $o$ is ‘overall wealth’ (human plus nonhuman), and $o\kappa$ is the amount that the model says is OK to spend (!)
Unanticipated Permanent Change In $r$

$$c_t = (r - \gamma^{-1}(r - \varphi)) \left(b_t + \varphi \left(\frac{1+r}{r}\right)\right)$$

Three effects:

- **Income Effect** (assume $\gamma^{-1} = 0$ and $\varphi = 0$):
  $$\Delta c_{t+1} = \Delta r_{t+1} b_t$$
Unanticipated Permanent Change In \( r \)

\[ c_t = (r - \gamma^{-1}(r - \theta)) \left( b_t + p \left( \frac{1+r}{r} \right) \right) \]

Three effects:
- **Income Effect** (assume \( \gamma^{-1} = 0 \) and \( p = 0 \)):
  \[ \Delta c_{t+1} = \Delta r_{t+1} b_t \]
- **Substitution Effect** (assume \( p = 0 \)):
  \[ \Delta c_{t+1} = \gamma^{-1} \Delta r_{t+1} b_t \]
Unanticipated Permanent Change In $r$

$$c_t = (r - \gamma^{-1}(r - \theta)) \left( b_t + p \left( \frac{1+r}{r} \right) \right)$$

Three effects:

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- Substitution Effect (assume $p = 0$):
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- Human Wealth Effect ($p \neq 0$, $r_t$ and $r_{t+1}$ small)
  $$\Delta c_{t+1} \approx \left( \frac{1}{r_{t+1}} - \frac{1}{r_t} \right) pk_t$$
  $$= \left( \frac{r_t}{r_{t+1}} - 1 \right) \left( k_t/r_t \right) p$$
Sizes? Depends ...

Simple calibration: $b_t = p = 1$, $r_t = 0.06$, $r_{t+1} = \vartheta = 0.03$

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So, now, one theory/calibration or another can accommodate any $0 < \alpha < 30$. 
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Definitely not rejected!
The Point? ‘Heterogeneity’

Characteristics of borrowers: ARM borrowers in 2004-2006

- Still in place in 2010-12

We don't know:

- How they differ in $\theta$, $\gamma$, $\sigma^2$, $\psi$, $\sigma^2$, $\theta$, ...
- Assets, family size/structure, age, ..
- Beliefs about future housing price growth (by locale?)
- Beliefs about future own income growth
- Beliefs about future path of interest rates (ARM and other)
- Why did they pick an ARM; etc etc etc

Any of these differences could make huge difference for behavior
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- From Keyes et al:
  - Difference in rate of car purchases, auto debt accumulation, and credit card debt path due to interest rate reset timing differences between 5/1 and 7/1 ARMs that expired in 2010-2012

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If I could send a message to my 2009 self, what is most I could say?

- ∃ people for whom extra income from ARM resets in 2009-2010 will lead to some deleveraging
- Little progress has been made on 'What will the MPC be out of stimulus payments?'
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Looking Under Lamppost With Laser Beam

Two views:

- LATE/Natural Experiment/Micro Crowd:
Looking Under Lamppost With Laser Beam

Two views:
- LATE/Natural Experiment/Micro Crowd:
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- Me: No! Use data and results to *calibrate a theory*
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Two views:

- LATE/Natural Experiment/Micro Crowd:
  - That’s all we can do.
- Me: No! Use data and results to *calibrate a theory*
  - IF data line up reasonably with theory, maybe we learned something
Theory Is Your Friend!

Three kinds of ‘heterogeneity’:

■ Within person over time:
  □ Shift in state variable – e.g., wealth shock (due, say, to house prices)
  □ Change in beliefs – e.g., a rise in uncertainty

■ Differences Across People
  □ e.g., time preference?
  □ Implicit assumption: Dummies control for these

Problems:
  − We don’t WANT to control for this, we want to measure it!
  − Dummies maybe control for levels but not patterns of behavior
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Example Of Puzzle That Isn’t

At a couple of places, some confusion about apparent contradiction:

- Low wealth borrowers have a higher MPC
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At a couple of places, some confusion about apparent contradiction:

- Low wealth borrowers have a higher MPC
- Low wealth borrowers deleverage *more*
A Wealth Shock

\[ \Delta m_{t+1}^e = 0 \]

\[ c(m) \]

\[ \hat{c} \]

Target

Wealth Shock

\[ c_t \]

\[ c_{t+1} \]

\[ m_t \]

\[ \hat{m} \]
Another Puzzle That Isn’t

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- Sometimes low wealth borrowers deleverage less
Differences Across Households In Time Preference

\[ \text{Orig Target} \downarrow \text{New Target} \downarrow \]
\[ \text{Orig } c(m) \rightarrow \text{New } c(m) \]

\[m\] \[c\]
More Exciting Part: Local Keynesian Effects!

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This DOES reject a theory: RBC at local level
Conclusion

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- ⇒ Use for calibrating theories