Discussion of "Subjective Intertemporal Substitution"

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Broad Overview

- Very interesting paper with current policy relevance
- Estimates elasticity of intertemporal substitution (EIS) using subjective quantitative data on expected consumption growth and expected inflation from NY Fed Survey of Consumer Expectations
- Estimates EIS of 0.8, roughly consistent with log utility
- Policy implications because EIS relevant for issues like size of fiscal multiplier at ZLB and power of forward guidance

More Specific Overview

- Standard Euler equation:

$$1 = E_t^i \left[\left(\frac{R_t}{\Pi_{t+1}} \right) \beta \left(\frac{C_{t+1}^i}{C_t^i} \right)^{-\frac{1}{\sigma}} \right]$$

- E_t^i is subjective expectation operator of agent i. R_t is assumed known at t. σ is the EIS
- First order approximation:

$$E_t^i \left[\Delta \ln C_{t+1}^i \right] = \sigma \ln \beta + \sigma \ln R_t - \sigma E_t^i \ln \Pi_{t+1} + o_{i,t}$$

Estimation

- Estimating equation: :

$$E_t^i \left[\Delta \ln C_{t+1}^i\right] = \sigma \ln \beta + \sigma \ln R_t - \sigma E_t^i \ln \Pi_{t+1} + o_{i,t}$$

- Assume β and σ are the same across all agents and that R_t doesn't vary with i
- Have data from NY Fed Survey of Consumer Expectations on expected consumption growth and expected inflation
- Basically exploiting cross-sectional variation in expected inflation to identify σ
- Find $\sigma \approx 0.8$ – reasonably close to log
- Potential downside: data only cover very small sample window (2013 to present)

Literature

- Lots of estimates based on both macro and micro data making use of realized consumption growth, rational expectations, and GMM. Macro data estimates tend to be near 0, micro data estimates a little higher
- Recent literature using subjective inflation expectations:
  - Bachmann, Berg, and Sims (2015): no (or negative) relationship between expected inflation and qualitative measure of spending attitudes on durable goods
  - Burke and Ozdagli (2013): no (or negative) relationship between expected inflation and most realized measures of consumption growth (durable and non) using pilot data from NY Fed survey
  - Ichiue and Nishiguchi (2015): find positive relationship between expected inflation and realized consumption growth using Japanese micro data
  - D'Acunto, Hoag, and Weber (2015): use increase in VAT in Germany to examine effect of increased expected inflation on willingness to buy durables. Strong, positive effect

Remainder of Discussion

- Remainder of talk will have three parts
  1. Critique / potential issues
  2. Some suggestions on things to do
  3. Broader discussion about how to think about these results from a policy perspective

Potential Issues

- Approach in the paper is simple, clean, and compelling
- But there are some potential issues:
  1. Durable vs. non-durable consumption
  2. Liquidity constraints

Durable vs. Non-Durable: Theory

- Agents get flow utility from non-durable consumption, C_t and stock of durable goods, D_t

$$U(C_t, D_t) = \frac{C_t^{1-\frac{1}{\sigma}}}{1-\frac{1}{\sigma}} + \frac{D_t^{1-\frac{1}{\sigma}}}{1-\frac{1}{\sigma}}$$

- X_t: expenditure on durables. Accumulation equation:

$$D_t = X_t + (1-\delta)D_{t-1}$$

- Euler equations:

$$C_t^{-\frac{1}{\sigma}} = \beta E_t C_{t+1}^{-\frac{1}{\sigma}} \frac{R_t}{\Pi_{t+1}} \tag{1}$$

$$D_t^{-\frac{1}{\sigma}} = \beta E_t C_{t+1}^{-\frac{1}{\sigma}} \left(\frac{R_t}{\Pi_{t+1}} - (1-\delta) \right) \tag{2}$$

Durable vs. Non-Durable: Data

- Authors estimate standard Euler equation for non-durables, (1)
- Potential issue: expected consumption data is on *total expenditure*. Question explicitly mentions expenditure on housing, education, and "any large items (such as home appliances, electronics, furniture, or car payments)."
- Estimating equation is mis-specified with respect to total expenditure
- Durable good expenditure only about 12.5 percent of personal consumption expenditures. But growth rate of durable expenditure is about four times more volatile than non-durable and services consumption

Liquidity Constraints

- Euler equation does not hold for agents facing a binding liquidity constraint
- Expected inflation might proxy for binding liquidity constraints
- In Michigan Survey of Consumers, for period 1984-2015:
  - Avg. expected inflation for respondents in top third of income distribution: 3.2 percent
  - Avg. expected inflation for respondents in bottom third of income distribution: 4.7 percent
- Also true in NY Fed SCE: 3.2 (low income) vs. 2.8 (high income) percent for 2013-2015
- Lower income people on average expect more inflation and are (probably) less likely to obey Euler equation
- Related issue: agents facing different interest rates
- Economic controls and individual fixed effects may (at least partially) address these issues

Things to Do

- Address the durable goods issue:
  - Special module from April 2015 split spending categories into different types. Can this be extended?
- Try a few reduced-form specifications
  - Instead of estimating Euler equation (which is potentially flawed) just estimate effect of expected inflation on current spending
  - In particular, try to resolve discrepancies with Burke and Ozdagli (2013), who regress realized consumption growth on inflation expectations
  - In their data, they seem to be able to condition on durable vs. non-durable goods

Broader Picture

- I am a big fan of use of surveys to draw inference about important macroeconomic questions
- This paper in particular is touching on a critically important issue
- Lots of policy proposals for a low interest rate environment (e.g. the size of the fiscal multiplier, the power of forward guidance) rely on:
  1. Interest sensitivity of spending
  2. Management of inflation expectations
- In textbook NK-DSGE models, spending is quite sensitive to interest rates and inflation expectations are quite "jumpy"

Broader Picture: Data

- Expected inflation seems pretty sluggish (Kocherlakota, 2016)
- Standard models wildly overestimate power of forward guidance (del Negro, Giannoni, and Patterson, 2012)
- Negative supply shocks do not seem contractionary at the ZLB (Wieland, 2015)
- Expected inflation does not react much to fiscal shocks (Dupor and Li, 2015; Hagedorn, Handbury, and Manovskii, 2014)
- Standard models seem too forward-looking – baseline Phillips Curve and Euler equation need fixing. "Fixes" to these issues include incomplete markets, borrowing constraints, rule of thumb price-setters

Conclusion

- Very interesting paper
- Really neat data set that could prove useful in improving and calibrating DSGE models
- Thanks!