Discussion of "Mortgage Prepayment and Path-Dependent Effects of Monetary Policy" by David Berger, Konstantin Milbradt, Fabrice Tourre & Joe Vavra

Monika Piazzesi

Stanford, CEPR & NBER

Discussion

- refis are complicated
  - optimal exercise of American option, no closed form solutions except in stark cases, high transaction costs/behavioral problems, strong life cycle patterns, idiosyncratic shocks in income and house prices, various maturities, moving decisions and household formation, ...

- paper proposes a simple refi model

- paper documents empirical fact: prepayment rate is path-dependent
  - depends on gap between locked-in rate and current mortgage rate
  - well known in mortgage literature

    for example, Table 2 in Schwartz and Torous 1989 based on prepayment rates in Ginnie Mae 30-year mortgage pool data 1978-1989

- model generates path-dependent refis

Model of refis

- no housing/mortgages, transaction costs

$$\max_C E\left[\int_0^\infty e^{-\delta t}\frac{C_t^{1-\gamma}}{1-\gamma}dt\right]$$

$$\text{s.t. } dW_t = \left[Y_t - C_t + r\left(a_t\right)W_t - m\left(a_t^*\right)F\right]dt$$

$$W_t \geq 0$$

- fixed income Y, receive only B with some constant probability
- Markov chain for finite aggregate state a, save at rate $r\left(a\right)$
- infinite maturity "mortgage": fixed amount F, locked-in state a^* determines $m\left(a^*\right)$, payment $m\left(a^*\right)F < B$
- how does a^* change? attention and moving arrive with constant Poisson arrival rates
  - attention: if $m\left(a\right) < m\left(a^*\right)$, lock in $a^* = a$
  - moving: same F, only resets a^* in $m\left(a^*\right)$

$$da_t^* = \left(a_t - a_{t-}^*\left[1_{[m(a_t)\,<\,m(a_t^*)]}\,dN_t^{(\tau_a)} + dN_t^{(\tau_m)}\right]\right)$$

Model of refis

- consumption smoothing is key motive

- refi model is isomorphic to special income shocks:
    - recession:
      if rate $m(a)$ drops below $m(a^*)$,
      get positive income shock $F\left(m(a^*) - m(a)\right)$
      partially hedges more adverse income shocks in recessions
    - if rate $m(a)$ increases, no shock unless move

- can this model capture refi behavior?

Move at constant rate

- Poisson process $N^{(\tau_m)}$ for moving with constant arrival rate

- American Housing Survey asks movers about their reasons for moving

- Many movers have reasons that are unrelated to economics
  (natural disaster, fire, death of a spouse, marriage, divorce, kids ...)

  Landvoigt, Piazzesi and Schneider 2015 AER

- Krivenko 2018 constant moving probability is important for bust
  move also when unemployed in recession, pushes down house prices

Attention arrives at constant rate

- Poisson process $N^{(\tau_a)}$ for attention with constant arrival rate

- low prepayment rates in the data, even with large gap between locked-in and current mortgage rate

- optimal American option exercise predicts frequent refis

- literature on mortgage-backed securities backs out high costs to refi e.g. Stanton 1995

- Schwartz & Torous 1989 find that prepayment rates increase in squared gap
  - refis more likely if rates fall drastically
  - maybe Poisson arrival probability should depend on a?

Overall impact of rate changes?

- model is about rate-refis

- are positive income shocks $F\left(m\left(a^{*}\right) - m\left(a\right)\right)$ quantitatively important?

  - impact on average $m\left(a^{*}\right)$ equals probability to get a new mortgage (refi or move): small

- how much do cash-refis contribute to overall consumption effect? higher MPCs?

- does the paper provide a lower bound?

- life cycle effects: young have twice as large consumption response (Wong 2017)