Discussion of "Credit Supply and the Housing Boom" by Alejandro Justiniano, Giorgio Primiceri and Andrea Tambalotti

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Stanford & NBER

Frankfurt, December 2014
Summary

• why did banks increase their mortgage supply during the boom?

• closed economy with housing trees, exog. endowments

   some households are more patient than others $\beta_L < \beta_B$

   borrowers have utility $c + \nu(h)$
   lenders ave inelastic demand for $h$

• two constraints on lending

   1. collateral constraint $D_t \leq \theta p_t h_{t+1}$
   2. supply constraint $-D_t \leq \bar{L}$

• higher $\theta$: higher house price interest rate — counterfactual

   higher $\bar{L}$: higher house price, lower interest rate!
Discussion

1. closed economy assumption

2. what caused credit supply to increase? why so gradually?

3. changes in mortgage quality in addition to quantity

4. boom-bust mostly in cheap homes (unlike in other episodes)
1. Closed economy

- borrowing constraints generate excessive interest rate volatility

  Alvarez & Jerman 2001  
  Lustig 2002 with collateral asset  
  Lustig & Van Nieuwerburgh 2005 with housing as collateral asset  
  wrong mechanism for asset price volatility

- this paper: laxer borrowing constraints imply higher interest rates

- US = open economy, small?

  global savings glut (Bernanke and others)  
  foreign demand for highly rated bonds keeps interest rates low
Congress created Freddie Mac to provide stability, liquidity, and affordability to the U.S. residential mortgage market.

“A primary purpose is to provide stability in the secondary market for home mortgages including mortgages securing housing for low and moderate income families. This can be accomplished through both portfolio purchasing and selling activities, as well as through the securitization of home mortgages.”

### 1. Closed economy ctd.

**U.S. securities outstanding, 2003 and 2007**

<table>
<thead>
<tr>
<th></th>
<th>Total Securities</th>
<th>Treasury securities</th>
<th>Agency debt</th>
<th>Corporate AAA</th>
<th>Corporate AAA</th>
<th>ABS/MBS</th>
<th>Corporate Non-AAA</th>
<th>ABS/MBS</th>
<th>Corporate Non-AAA</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total U.S. securities outstanding, 2003</td>
<td>29,757</td>
<td>3,342</td>
<td>5,969</td>
<td>393</td>
<td>1,439</td>
<td>4,093</td>
<td>254</td>
<td>14,266</td>
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</tr>
<tr>
<td>2. Held by foreign investors</td>
<td>5,239</td>
<td>1,477</td>
<td>571</td>
<td>157</td>
<td>162</td>
<td>1,003</td>
<td>29</td>
<td>1,839</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Of which: Europe</td>
<td>2,182</td>
<td>345</td>
<td>192</td>
<td>74</td>
<td>86</td>
<td>496</td>
<td>15</td>
<td>974</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Of which: GSGs</td>
<td>870</td>
<td>449</td>
<td>198</td>
<td>5</td>
<td>11</td>
<td>33</td>
<td>2</td>
<td>172</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Held by U.S. residents</td>
<td>24,518</td>
<td>1,864</td>
<td>5,398</td>
<td>236</td>
<td>1,277</td>
<td>3,090</td>
<td>225</td>
<td>12,427</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Total U.S. securities outstanding, 2007</td>
<td>40,169</td>
<td>4,113</td>
<td>6,786</td>
<td>425</td>
<td>3,154</td>
<td>5,286</td>
<td>458</td>
<td>19,947</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Held by foreign investors</td>
<td>9,796</td>
<td>2,384</td>
<td>1,384</td>
<td>214</td>
<td>788</td>
<td>1,679</td>
<td>114</td>
<td>3,232</td>
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<td></td>
</tr>
<tr>
<td>8. Of which: Europe</td>
<td>3,978</td>
<td>399</td>
<td>308</td>
<td>126</td>
<td>487</td>
<td>993</td>
<td>71</td>
<td>1,594</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Of which: GSGs</td>
<td>2,082</td>
<td>905</td>
<td>656</td>
<td>9</td>
<td>44</td>
<td>72</td>
<td>6</td>
<td>389</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Held by U.S. residents</td>
<td>30,373</td>
<td>1,729</td>
<td>5,402</td>
<td>210</td>
<td>2,366</td>
<td>3,607</td>
<td>344</td>
<td>16,715</td>
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</tbody>
</table>

**Memo:**

11. Change in foreign held / change in value outstanding (%)  
   43.8  117.5  99.6  182.0  36.5  56.7  42.0  24.5

Note: Changes in holdings and securities outstanding include valuation changes. Global saving glut (GSG) countries include Asia (excluding Japan) and the Middle East. ABS: asset-backed securities (excluding MBS); MBS: mortgage-backed securities.  
Source: Staff estimates based on Flow of Funds and Treasury International Capital system.
1. Closed economy ctd.

- change market clearing condition for bonds

\[ DB_t + DL_t = 0 \]

to

\[ DB_t + DL_t + \bar{D}_t = 0 \]

where \( \bar{D}_t \) is demand by foreigners

- measure \( \bar{D}_t \) from data on foreign purchases, solve model again

- Piazzesi & Schneider 2012,
  Favilukis, Ludvigson & Van Nieuwerburgh 2013
2. Causes of changes in credit supply

- vary $\bar{L}$ in supply constraint $-D_t \leq \bar{L}$

- appendix derives $\bar{L} = \chi \bar{E}$ from
  - capital requirements $D_t \leq \chi E_t$
  - infinite adjustment costs for equity around $\bar{E}$

$$f \left( \frac{E_t}{\bar{E}} \right) = \left( \frac{E_t}{\bar{E}} \right)^\gamma$$

where $\gamma \to \infty$
2. Causes of changes in credit supply ctd.

• vary $\bar{L} = \chi \bar{E}$
  - vary cap requirements $\chi$
  - vary $\bar{E}$ that enters equity issuance costs.

• direct evidence for these changes?

• equity issuance costs are symmetric. retained earnings?

• financial accelerator model:
  equity adjustment costs are asymmetric: downward not upward earnings gradually increase bank net worth, lending expands

• gradual learning about subprime lending and hybrid mortgages
3. Subprime and hybrids

Subprime and Alt-A shares of the market quintupled between 2001 and 2006, then declined sharply.

Source: Inside Mortgage Finance (by dollar amount) and Freddie Mac. 2008 data is as of September 30, 2008.
Recent Alt-A and subprime originations are performing far worse than earlier originations

Cumulative 60-days or more delinquency rate as a share of the number of loans originated

Source: Loan Performance, a subsidiary of First American Real Estate Solutions.
Hybrid ARM mortgages are experiencing faster delinquency rates than fixed-rate mortgages.

Source: Citigroup.
3. Subprime and hybrids ctd.

- not just quantity, but also quality adjusts
- subprime and hybrids are higher risk
- with risk-neutral banks, these are projects with lower expected returns (ambiguity or pessimism)
- gradual increase with financial accelerator: richer bank does projects with lower expected return
- gradual learning about risks
4. Boom-bust episode mostly in cheap homes

Repeat sales 2000 – 2005; San Diego County, CA

- capital gain 2000−5, % p.a.
- House Value in 2000 (thousands of dollars)

repeat sales
fitted value
4. Boom-bust episode mostly in cheap homes ctd

- model with housing tree: all Euler eq hold including Bill Gates and poor households relaxing borrowing constraints cannot matter much

- model with distribution of house qualities Euler eq of marginal buyers hold relaxing borrowing constraints matters for low quality houses (Landvoigt, Piazzesi, Schneider 2013)

- this paper: Euler eq of constrained agents hold Euler eq of unconstrained agents do not hold (inel. demand)

- how to think about magnitudes, e.g. value of housing stock? model determines house price of contrained agent needs to rise more than US average in Figure 1

- should unconstrained agents buy different kind of house?