Discussion of:
Financial Technology and the 1990s Housing Boom

by Stephanie Johnson

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June 2, 2021
AREUEA National Meetings

Overall reactions

Very interesting paper studying the effects of automated mortgage underwriting

→ Part of growing research interest in AU (Foote et al. 2019; Bhutta et al. 2021)

Among the things to like about the paper:

1. **Important**, **specific**, technological innovation in mortgage lending
   - Literature often vague about how technology affects credit supply – e.g., *"technological advancements in risk management"* (Mian & Sufi 2009)
2. Exploits some nice institutional features that can aid in identification
   - AU led to change in lending standards for Freddie but not (initially) for Fannie
   - "Asssignment" to AU system significantly driven by historical GSE relationships
3. Serious investment by Stephanie in mastering the historical details

Putting the paper in context

- Two channels (at least) through which technology could affect lending:
  1. Allows lenders to adjust standards, reshape credit surface
  2. Increases underwriting speed/efficiency, makes process smoother, reduces costs

- Recent innovation I think is mostly about **channel 2** (e.g., Quicken)

- This setting: both **channel 1** *and* **channel 2**
  - e.g., Fannie initially adopts AU just to automate existing standards
  - Can you say anything about relative role of 1 vs 2?
  - Would be nice to frame paper relative to recent "fintech" research (e.g., Buchak et al., 2018; Fuster et al. 2019; Jagtiani et al. 2019 etc.)

Effects of automated underwriting: peeling back the onion

Step 1: Firm-level effects on lending & standards for AU "early adopters"

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Step 2: Effects on *aggregate* lending

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Step 3: Effects on home prices

Main suggestion: Focus more on pinning down step 1 and step 2

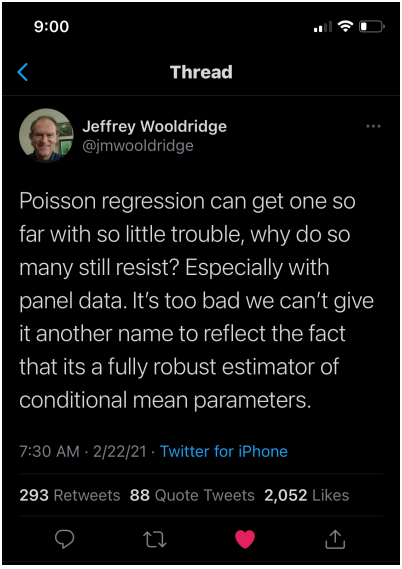
Step 1: Did AU induce increase in credit supply for early adopters?

- Paper finds earlier Loan Prospector (Freddie) adopters experience:
  1. 70% higher lending growth between 1993-96 [table 5]
  2. Increase in proportion of high-LTI + low income lending [table 6]

- Challenge: AU adoption endogenous. Essential to convince reader of causality here

- Suggest trying to beef up. E.g., three suggestions re Table 5 (lending growth):
  1. Show results for Desktop Underwriter early adopters too (better control group)
  2. Present year-by-year results (even if just in aggregate). Test for pre-trends
     → Y-b-Y elsewhere, why not here? Dummy for county = missing? Start earlier in time?
  3. Be careful of log specification ... consider Poisson (e.g., Cohn et al. 2021)

The Good Word on poisson



Step 2: Did AU affect *aggregate* lending volumes / standards?

- Are magnitudes reasonable?
  - County-level log(LTI) already up 26.5 in 1994 [table 8]. Too early? And much larger than individual lender effect, even though LP adopters usually <5% market share?
  - Large effect on log(LTI) in 1994-96 but no effect on P(LTI>3) in same period?
- Would be nice to show results for lending volume, not just LTI
- Any way to look at effects on stock of loans, in addition to flows?
  - E.g., American Housing Survey, which covers this period?
  - Adelino et al. (2016 RFS) and Foote et al. (2020 REStud) show distinction flow and stock of loans can matter a lot

Step 3: Did credit growth caused by AU lead to higher home prices?

- Similar comment – are the magnitudes and timing of results reasonable, given the small initial share of "early adopters"?

- Place your results in context of papers estimating Δhome prices / Δcredit.

  $\rightarrow$ Greenwald and Guren (2021); Di Maggio and Kermani (2017); Favara and Imbs (2015); Adelino, Schoar and Severino (2015) etc.

Other thoughts & questions

- Timing: What is "right" start & end of Loan Prospector (LP) natural experiment?
  - **Start:** Loan Prospector released in 1995, but pilot in 1994. But initial standards in LP were quite tight, and gradually relaxed over time (from 1995-2000)? When "should" effects start showing up?
  - **End:** Eventually Fannie also changes standards, and many other lenders adopt AU. When is "early adopter" variable no longer relevant?

- Suggest replacing key tables with "event study" graphs tracing out dynamics

Wrapping up

- Automated underwriting was a big deal!!
  - Large changes in weights on different credit variables in span of only a few years
  - Backdrop: (i) large rise in homeownership; (ii) start of acceleration in home prices
- Stephanie's paper is a really nice contribution towards understanding this period and measuring the effects of AU.

Thanks!