"Fintech, Regulatory Arbitrage, and the Rise of Shadow Banks"

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This Paper

- How is mortgage origination landscape changing?
  - Shadow bank market share: 30→50% from '07→'15
    - Shadow bank FHA market share: 45→75% from '07→'15
  - Shadow Banks are more likely to...
    - Grow in low income, minority regions
    - Sell newly originated loans (and do so more quickly)
    - Offer less favorable loan terms to borrowers
    - Originate loans that are pre-paid
- Is regulation causing this?
  - Empirics suggest that tighter traditional bank regulation fuels growth among unregulated banks
  - Empirical model suggests policy responsible for 70% of growth of Shadow Bank originations

Empirical Specification

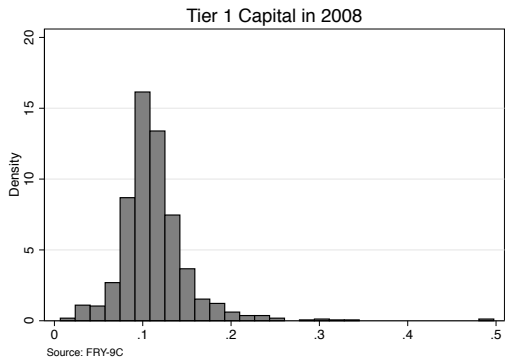
- Basic empirical question:
  - How is growth in regulatory capital related to shadow bank market penetration in loan origination?

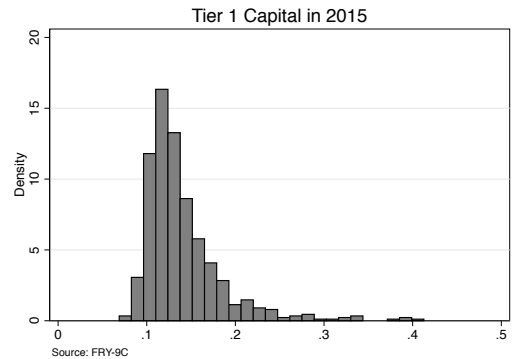
$$\Delta_{'08 \to '15} ShadowShare_c = \beta_0 + \beta_1 \Delta_{'08 \to '15} T1Cap_c + \beta_x X_c + \epsilon_c$$

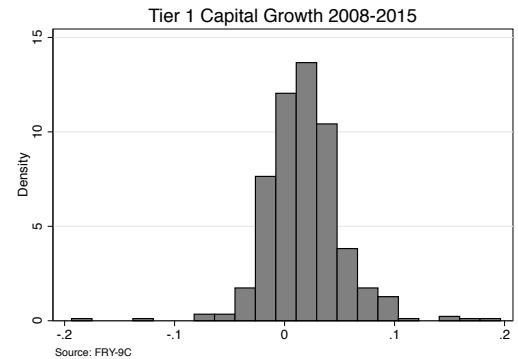
  - Find: $\beta_1 > 0$
  - Interpretation: *Regulation* increased Shadow Bank market share

- Next:
  - Understand identification
  - Technical questions
  - What can we infer from changes in market shares of origination?

Identification

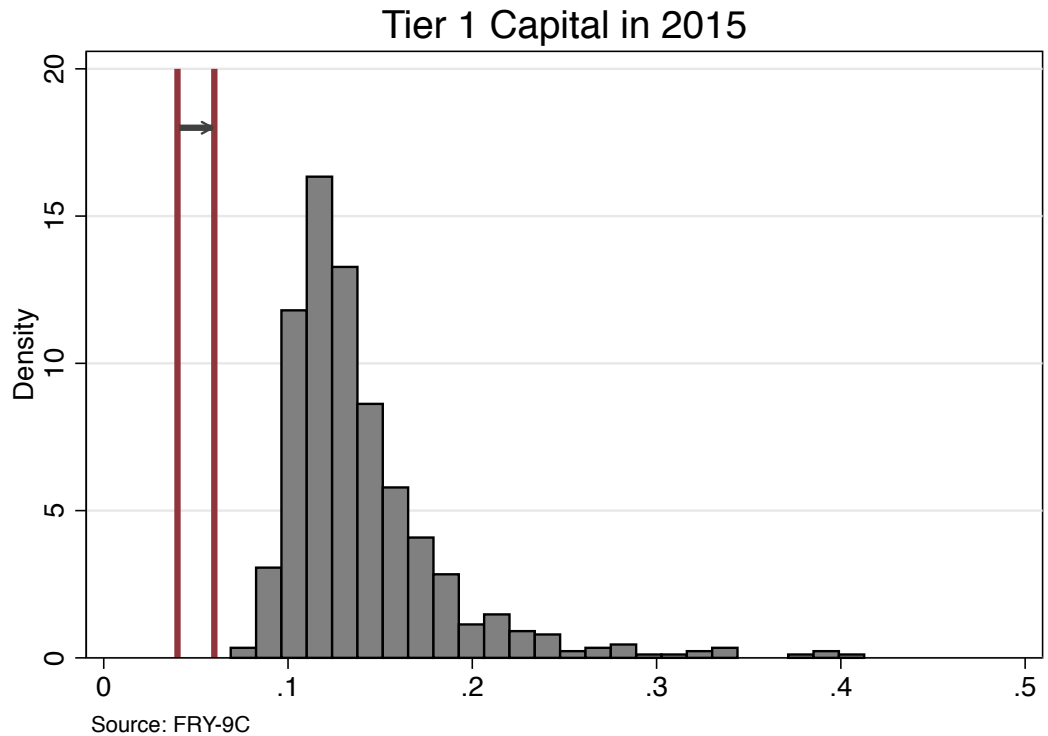






- Variation in Tier 1 RA-based capital ratios pre- and post-regulation change
- Larger growth in Tier 1 RA-based capital *more* impacted by policy

Identification Questions (I)



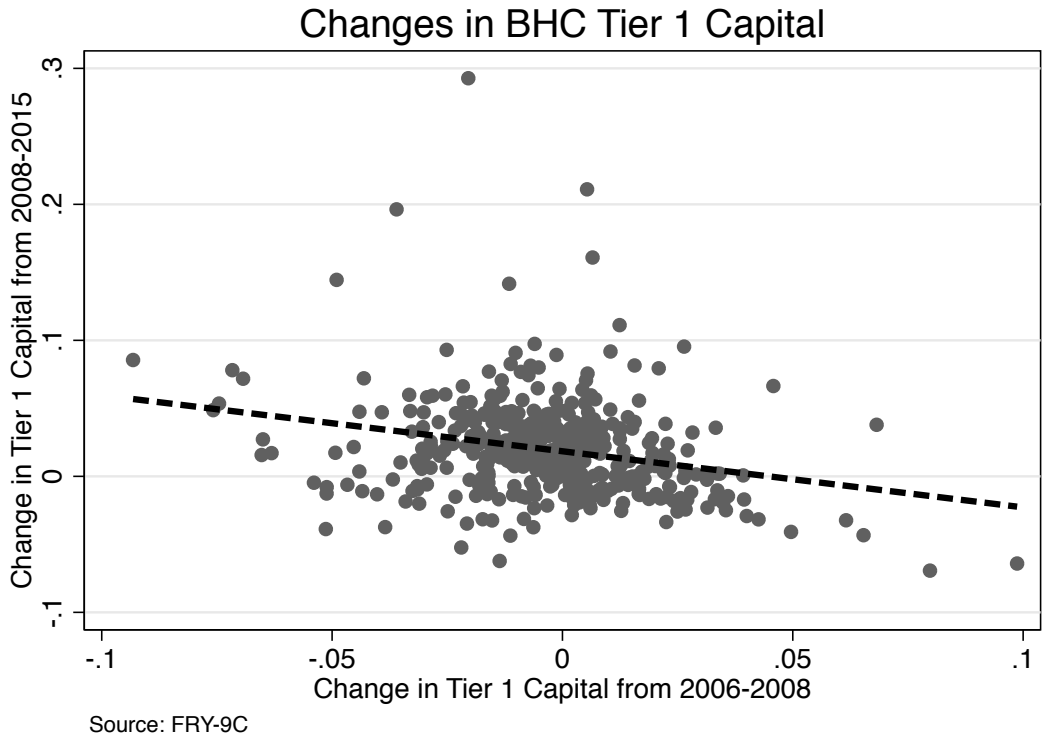
- Is it reasonable to attribute changes to policy?
- Would like a theory of the buffer/implicit capital requirements
  - See Corbae and D'Erasmo (2017) or Bianchi and Bigio (2017)

Identification Questions (II)

$$\Delta_{'08 \to '15} ShadowShare_c = \beta_0 + \beta_1 \Delta_{'08 \to '15} T1Cap_c + \beta_x X_c + \epsilon_c$$

- Important to understand what is special about banks/counties with large $\Delta_{'08 \to '15} T1Cap_c$
  - Banks raising equity
  - Banks shifting to origination of safe assets/loans
- One possibility: Shadow Banks enter where high safe loan *demand*
  - Shadow banks originate (conditionally) *safe* loans
  - Possible to control for demand using methods of Amiti and Weinstein (2016)?
    - See also Mersault (2017)
    - Paper does show shadow bank growth associated with decline in bank lending; would like to see control for change in *safe* bank lending
- Another possibility: Shadow Banks attack weak traditional banks

Identification Questions (II)

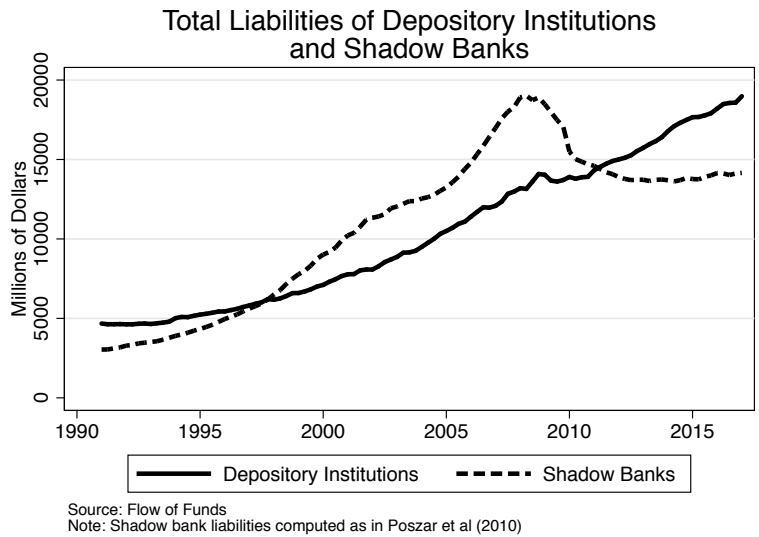


- Banks with high 2008→2015 growth associated with large losses from 2006→2008
- But $\Delta_{'06\rightarrow'08} T1Cap_c$ not associated with regulatory changes
  - Possible to use to develop instrument?

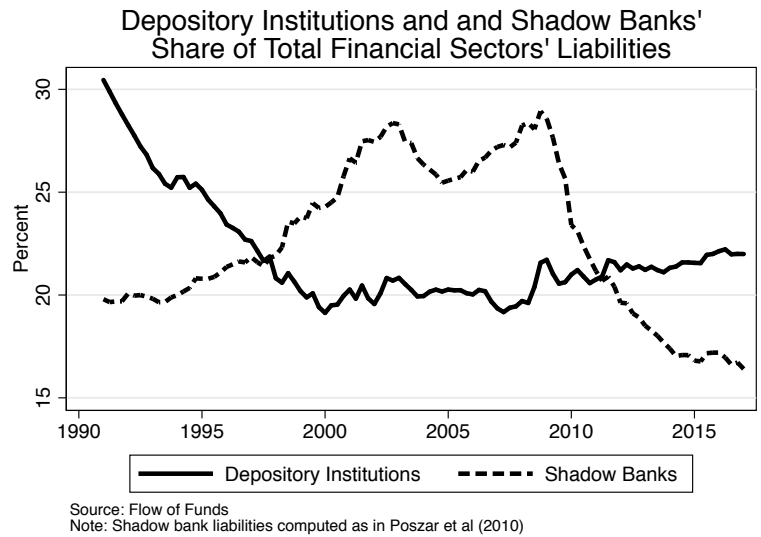
Context

- Paper's language points to broader agenda:
  - Impact of regulation on industrial organization of financial industry

- What can we infer more broadly about this I/O?



Source: Flow of Funds
Note: Shadow bank liabilities computed as in Poszar et al (2010)



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- Will use toy model to illustrate difficulty of making inferences *output* of financial sector

A Toy Model of the Financial Sector

- Agents: Consumer, Traditional Banks, Shadow Banks
- Consumers purchase risky "loans" from banks
- Traditional banks can produce "safe" or "risky" loans
  - Risky loans produced at lower marginal cost than safe loans
    - Due to FDIC, bailouts, Fed Put, etc...
    - Policy may require banks to issue safe loans in proportion to risky loans
  - Safe loans useful as an input in shadow bank production
    - Motivated by Gorton and Metrick (2009)
    - Idea: Shadow banks funded by Money Market Mutual Funds who need sufficient collateral to attract deposits
- Shadow banks use safe loans to produce risky loans

A Toy Model of the Financial Sector

- Consumers' demand for risky loans:

$$p_r = a - bY$$

- Shadow banks are competitive, solve

$$\max_x p_r x - p_s x$$

- Assume Traditional bank is a monopolist/dominant firm with constant marginal costs ($c_x > c_y$)

$$\max_{y,x} p_r(y,x)y + p_s(y,x)x - c_y y - c_x x$$

  subject to

$$x \geq \xi y$$

- Equilibrium: (p_r, p_s, x, y) satisfying optimality of shadow banks, traditional bank, and consumer demand function; market clearing.

A Toy Model of the Financial Sector

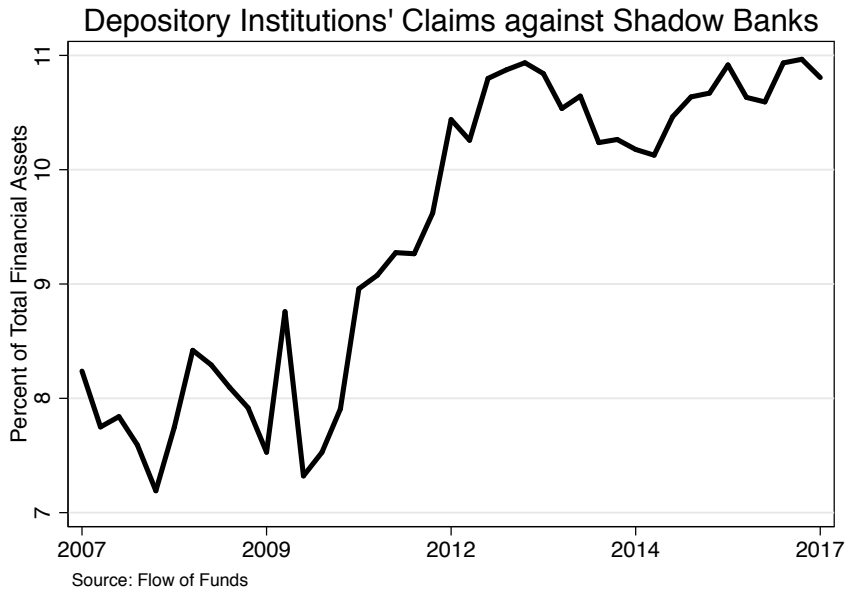
- Equilibrium Outcomes:
  - Shadow Bank optimality: $p_r = p_s$
  - Traditional Bank optimality: $x = \xi y$ and

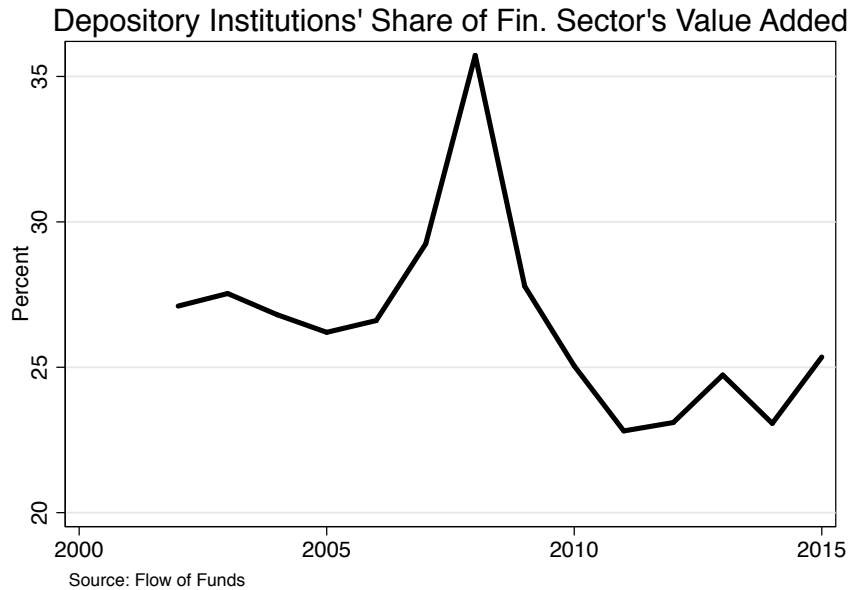
$$y = \frac{a - c_y - c_x \xi}{2b(1 + \xi)}$$

  - Shadow Bank risky loan market share: $SBShare = \frac{\xi}{1+\xi}$

- Equilibrium Implications:
  - *TB* production of safe assets increasing in ξ (for small ξ)
  - *SB* market share in origination increasing in ξ
  - Consumer surplus decreasing in ξ
  - No meaningful impact on industrial organization of financial sector
  - What do we see in (aggregate data)?

Aggregate Implications





- Traditional Banks re-allocated portfolio towards ownership of shadow banks when regulation increased
- But... Traditional banks' profit share declined
- Suggests challenge for future research: need to understand input/output matrix of claims within financial sector to evaluate impact of policy on I/O of financial industry

Summing Up

- Important contribution to evaluating impact of regulation on activities of regulated and un-regulated banks
    - Still room for sharpening sense in which change in Tier 1 Capital post-crisis is good proxy for severity of change in capital requirement
- Much more detailed (and interesting!) analysis in paper of activities of shadow bank origination relative to traditional banks
- Room for agenda studying input/output linkages between regulated and unregulated banks