Open Banking: Credit Market Competition When Borrowers Own the Data

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Introduction

Open Banking as part of Open Data Economy

- "Open" customer data to third parties, upon customer's consent

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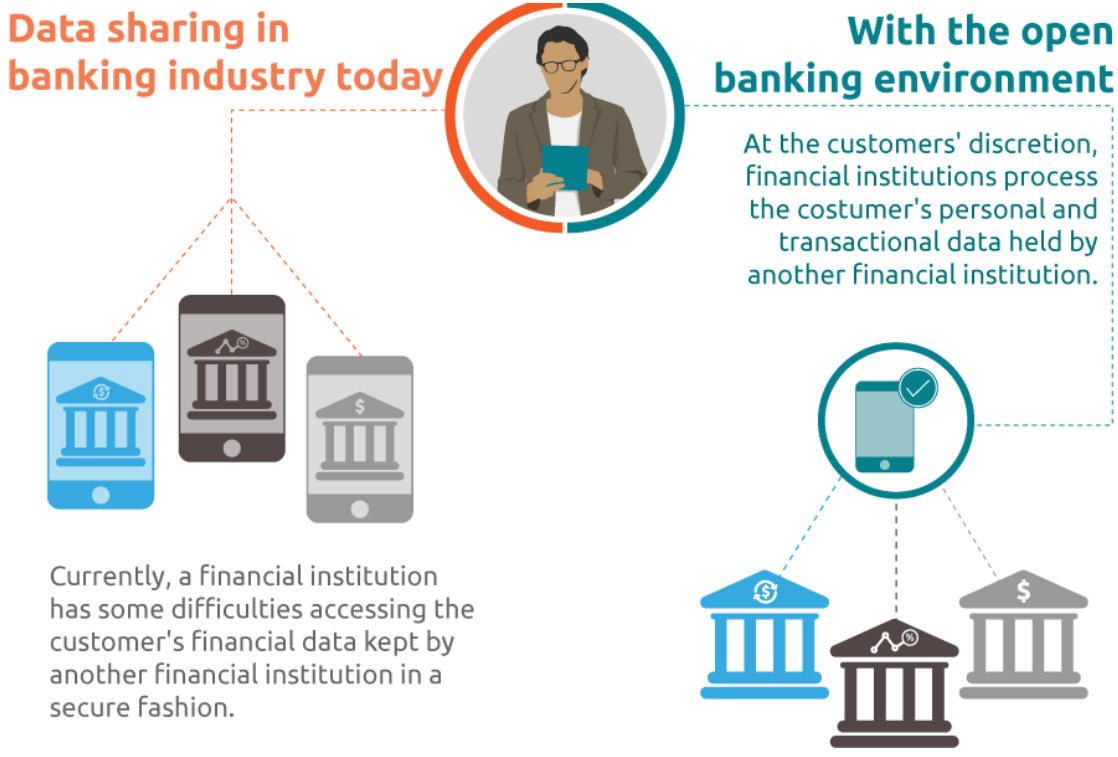

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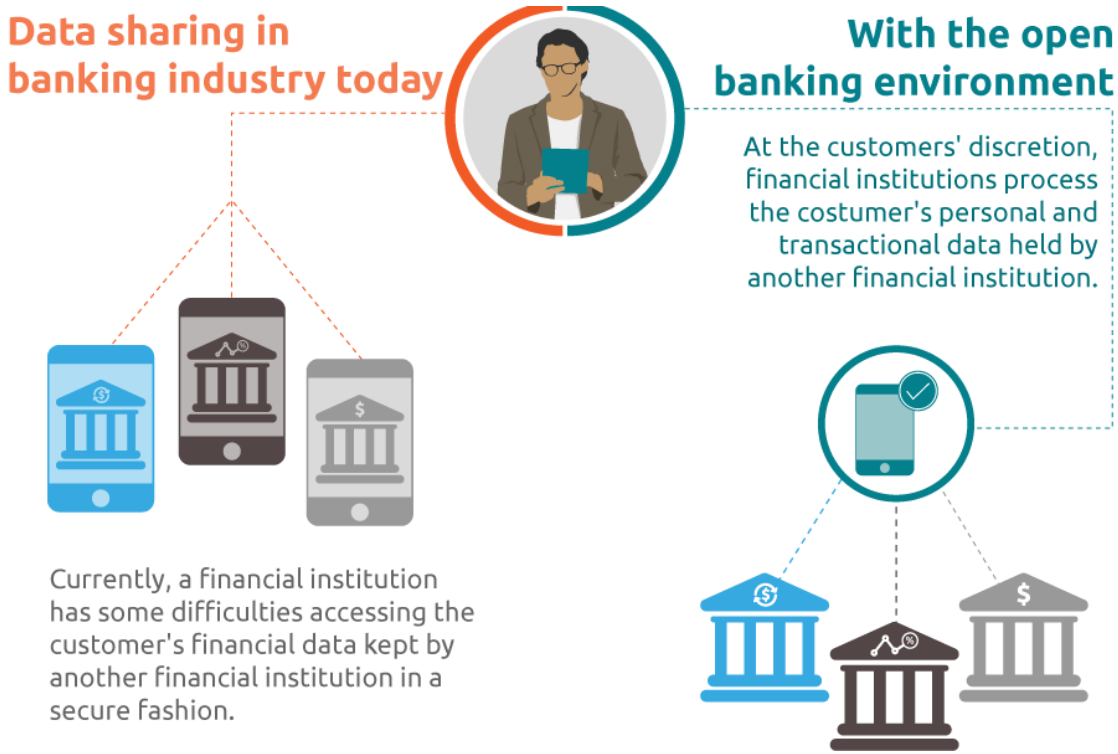

- EU, UK: Government-led initiatives; mandate banks to enable data sharing (PSD2) with opt-in/opt-out feature
- Brazil, led by central bank, to be completed by Sept 2022
- U.S., market driven. 06/2021, "*Customers are now able to share their data with fintechs, thanks to an agreement between* **Capital One** *and* **Plaid**"

Open Banking: An Illustration

A Survey done by Deloitte Insight, April 2019

"Imagine you want to use a financial product offered by an organization other than your bank. This product could be an app that gives you a full picture of your financial status, a mortgage, or line of credit. But for this product to be fully useful to you, it needs information from your bank, such as the amount of money coming in and going out of your accounts.... You then instruct your bank to share this information with this other institution or app. This concept is called **open banking**."

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"Open banking is ... revolutionary for underwriting loans. Previously, we would run hundreds of automated rules to determine which customer was best to lend to ... (but) these could never be fully verified ... With open banking, we see the exact bank transactions that customers have had ... In particular, if there is a history of repeat gambling ... (then) we should be more cautious with this kind of client—maybe declining them or charging a higher rate."

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Welfare implications on borrowers

- "Voluntary" feature, opt-in/opt-out feature

This Paper: Welfare Implications

Canonical credit market competition

- Lenders with asymmetric screening abilities, that could be affected by borrowers' data sharing

Open banking: Transaction data sharing

- Enables better borrower screening by fintech
- Disruption to the banking industry, potential benefit to challenger fintechs as well as customers

But, all borrowers could be worse off despite voluntary sign-up

- Equilibrium credit quality inference; opt-out $\neq$ no open banking
- Conditions under which it occurs, with robustness on fintech affinities & Laissez-Faire approach to open banking
- Consumer welfare (as opposed to total surplus), more practically relevant to regulators who mainly concern consumer protection

Related Literature

Credit market competition and information technology

- Broecker (1990), Hauswald and Marquez (2003, 2006), Goldstein, Huang and Yang (2022)
- Thakor (1996), Rajan (1992), von Thadden (2004), Pagano and Jappelli (1993), Bouckaert and Degryse (2006)

Fintech Disruption

- Buchak, Matvos, Piskorski and Seru (2018), Vives (2019), Fuster, Plosser, Schnabl and Vickery (2019), Tang (2019), Di Maggio and Yao (2020), Berg, Burg, Gombović and Puri (2020)
- Rajan, Parlour and Zhu (2021), Huang (2022)

Privacy and Economics of Data

- Liu, Sockins and Xiong (2020), Aridor, Che and Salz (2020)

Common Value Auction

- Milgrom and Weber (1982), Banerjee (2005)

Model Scheme

High type: success w.p. 1 yield $\overline{r}$; low type, success w.p. 0

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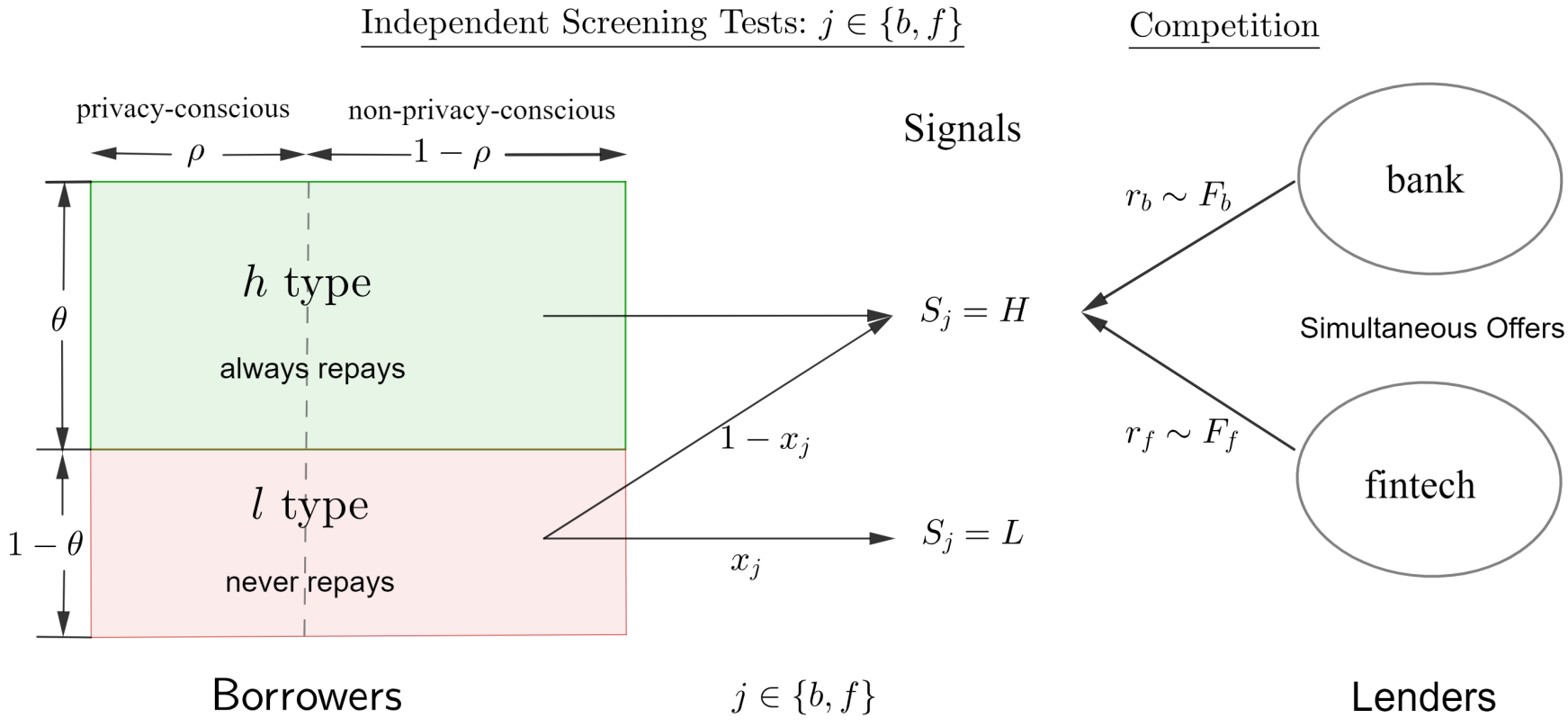


Before open banking: $x_f < x_b$

After open banking, on a borrower who signs up: $x'_f > x_b$

Road Map

Baseline model

- Credit market competition for borrowers with private types
- Lenders (bank and fintech) with asymmetric screening technologies

Open banking: Transaction data sharing

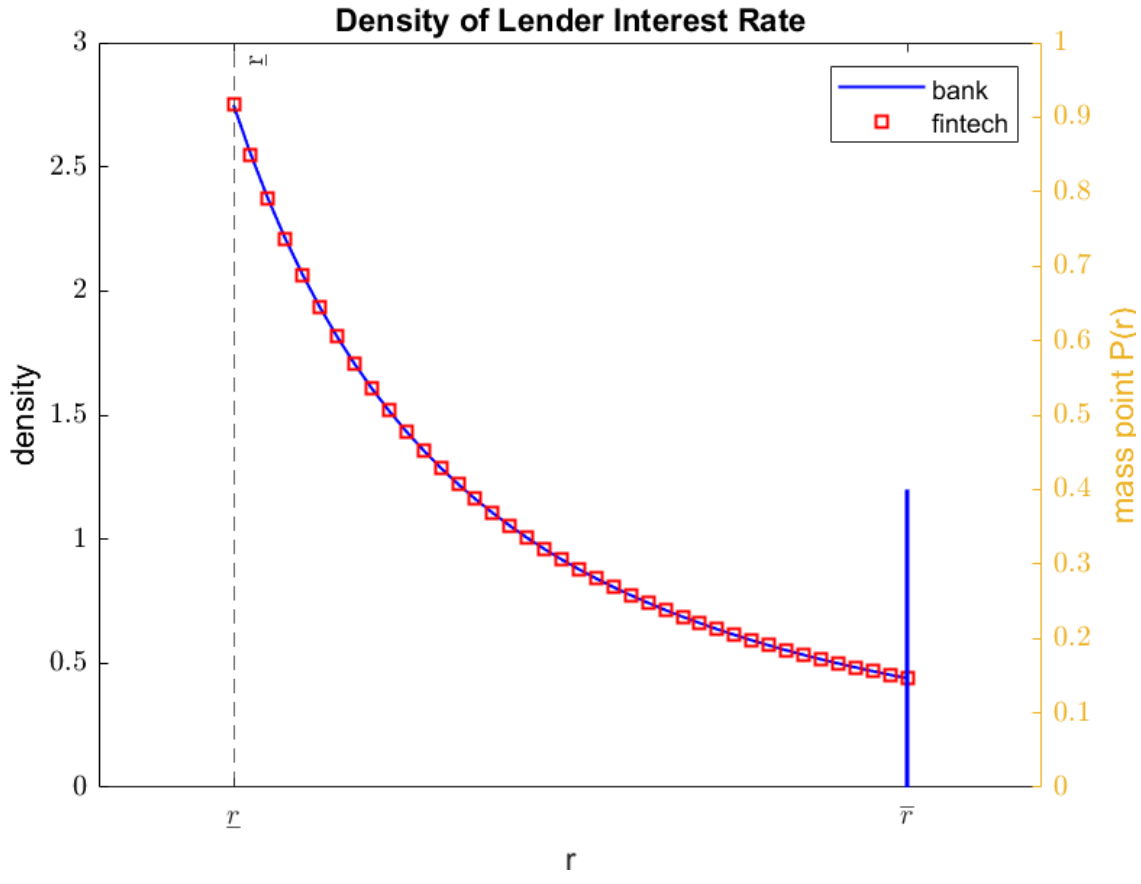
- Potentially perverse effect of open banking

Robustness

- Fintech affinity
- Laissez-Faire Approach to open banking
- Multiple Fintechs

Baseline Equilibrium

- Unique mixed-strategy equilibrium in close-form, **winner's curse** (Broecker; Hauswald-Marquez)



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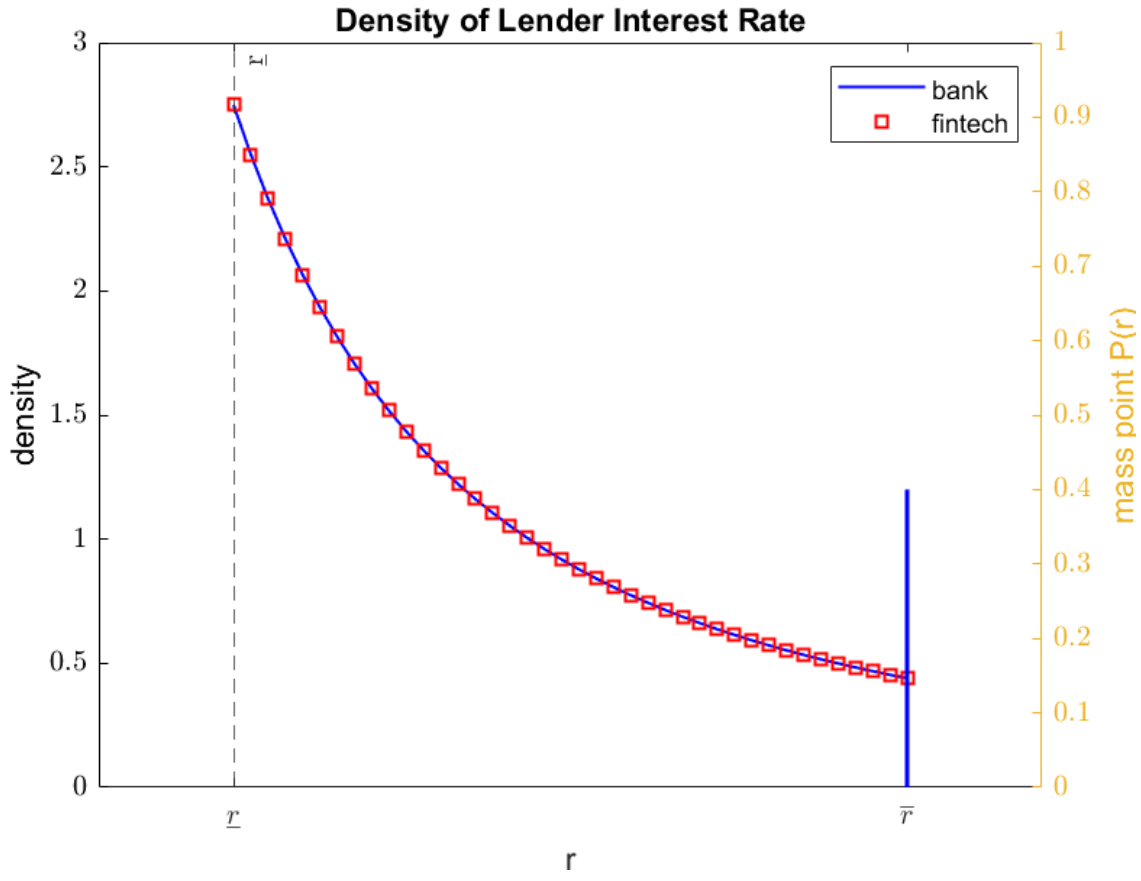

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  - Stronger bank makes a profit $(1-\theta)\left|x_b - x_f\right|$

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The Impact of Open Banking

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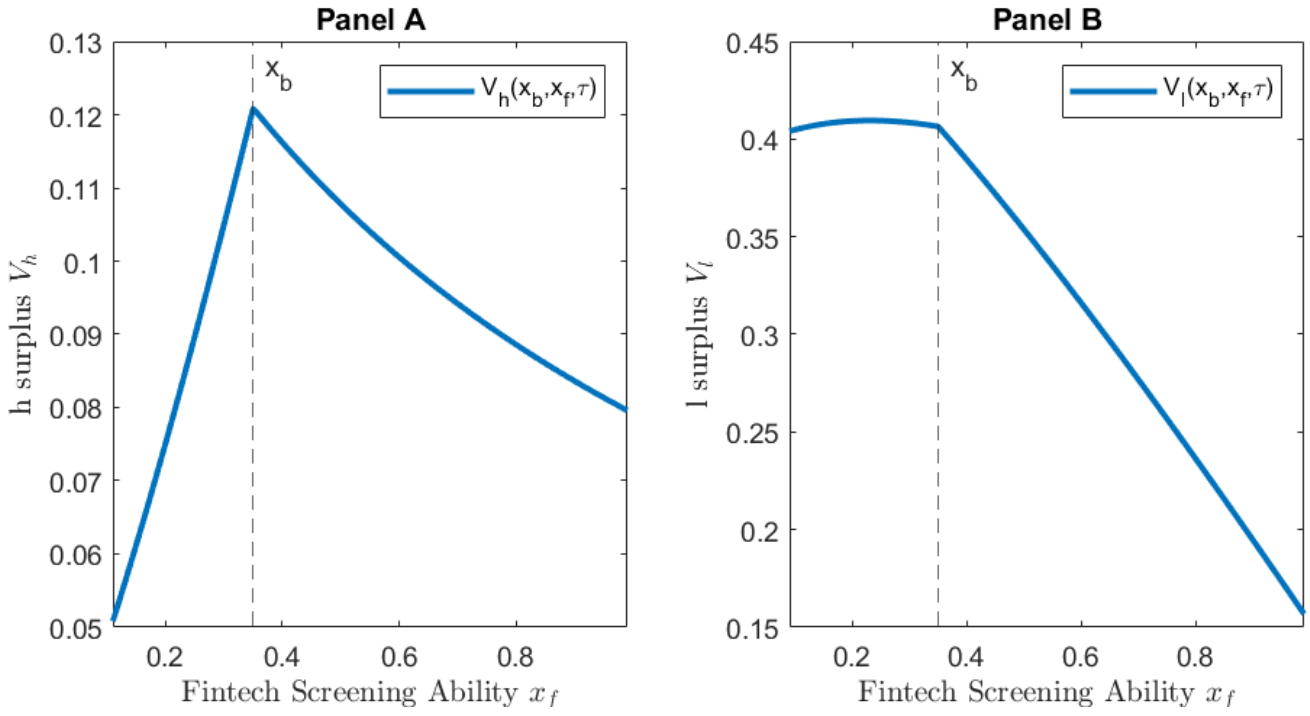
Mandatory sign-up benchmark: borrower surplus



- Informational effect: *Base* $\min\{x_b, x_f\} \uparrow \Rightarrow V_h \uparrow$ while $V_l \downarrow$
- Strategic effect: *Gap* $|x_b - x_f| \uparrow$, stronger winner's curse & less competition $\Rightarrow V_h \downarrow$ and $V_l \downarrow$

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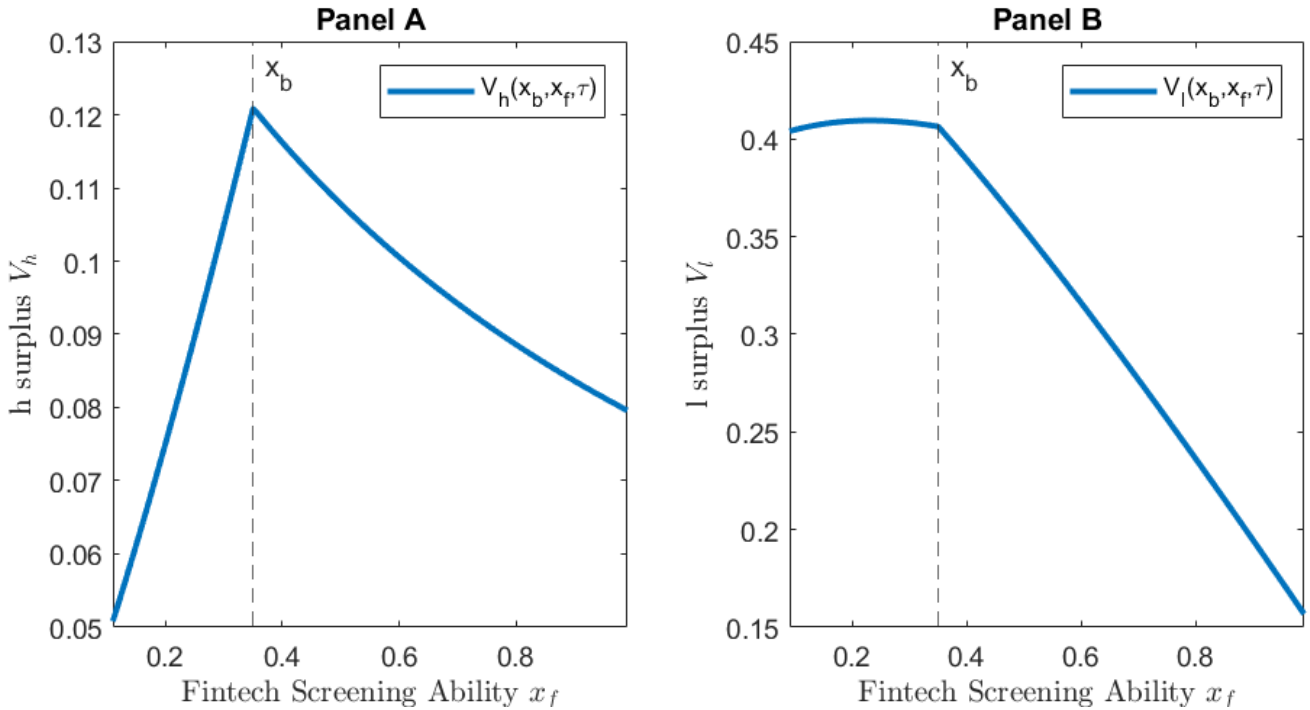

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Proposition: Mandatory sign-up, all borrowers hurt with sufficiently large x_f'

Voluntary Sign-up Equilibrium

Voluntary opt-in/opt-out does not solve the problem

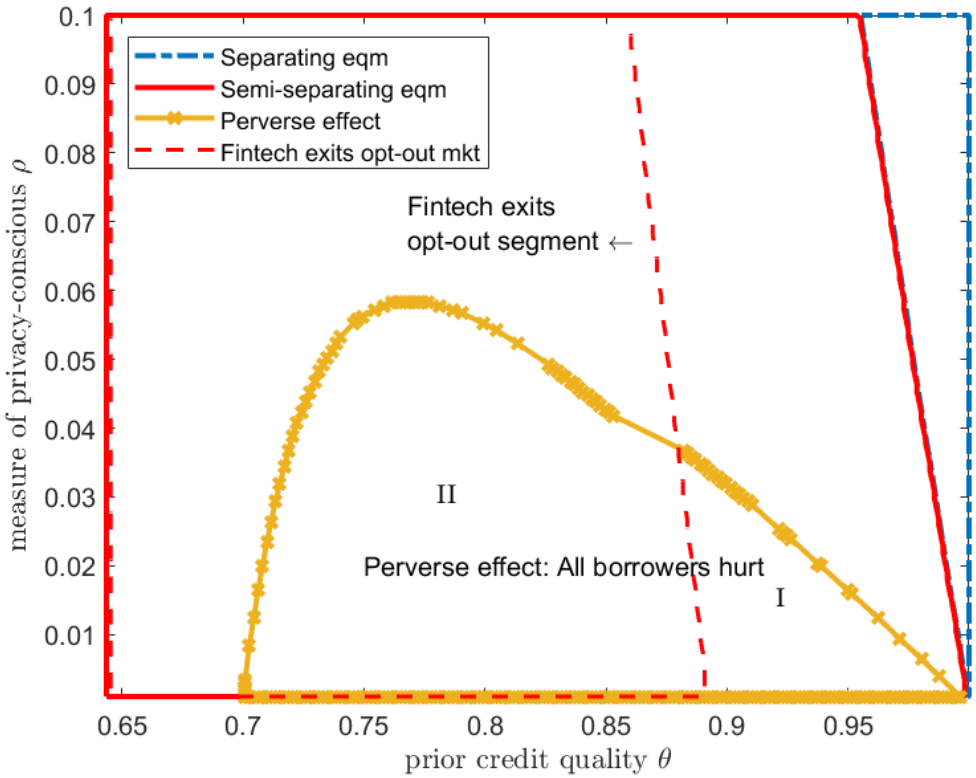
Voluntary sign-up equilibrium

- There always exists a trivial equilibrium where nobody signs up
- **Proposition:** There exists a unique non-trivial equilibrium, where all non-privacy-consciousness h-type always sign up

Equilibrium credit quality inference

- h-type have stronger incentive to sign up than l-type
  - Equilibrium credit quality inference: θ_-, θ_+
- All borrowers could become strictly worse off (relative to no open banking)
  - Opt-out $\neq$ no open-banking: stuck with $\theta_- < \theta$
  - Opt-in: $\theta_+ > \theta$ but x_f' is really high

Potential Perverse Effect of Open Banking



Parameters: $x_b = 0.4, x_f = 0.35, x_{f'} = 0.8, \overline{r} = 0.36$.

- **Perverse effect** may arise when equilibrium is semi-separating (some I-type opt in)
  - Small ρ (privacy-cons.); more applicable to small business loans
  - Lower θ (quality): Region II, fintech exits from the opt-out segment
- Privacy-conscious borrowers always suffer due to open banking

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Robustness:

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Fintech Affinity

Consumer "affinity/preference" toward fintech loans

- Huang (2022): Fintechs compete against banks in different dimensions

With prob. $\xi > 0$, borrowers attach zero value to bank offer

- Impatience shock and fintech is fast
- Bank suffers more from **winner's curse**

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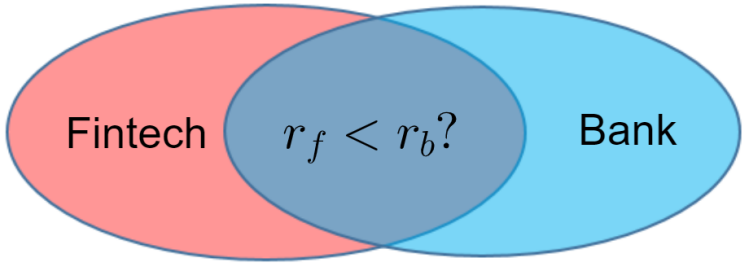
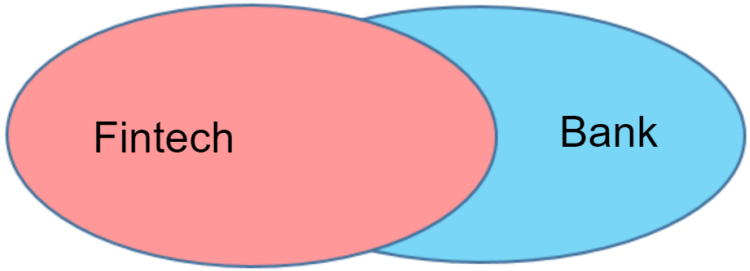
Baseline: Prob. $1 - \xi$



Fintech affinity event: Prob. ξ



Implications of Fintech Affinity

Perverse effect fintech in ξ

- Fintech affinity complements fintech lenders' screening ability boosted by open banking
  - Due to worsened winner's curse, bank gets hurt disproportionately in competition for a potentially profitable borrower
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Exploitative targeted loans: what if open banking reveals ξ-event?

- Open banking allows fintechs to target on vulnarable borrowrs
- Perverse effect still there: all borrowers might be worse off
  Opt-in: exploited in captured events; opt-out: unfavorable credit quality inference

Laissez-Faire Approach to Open Banking

Data ownership and market-led open banking

- Bank "sells" customers' transactions data to fintech
  - Timing: bank charges fintech a fee (take-it-or-leave-it offer)$\rightarrow$screening$\rightarrow$competition

When borrowers have no control on data

- Industry profit $(1-\theta)\left|x_b - x_f\right| = (1-\theta)\,\Delta$; sell when $\Delta' > \Delta$ (widened asymmetry after selling data)

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When selling data requires borrower consent

- Bank sells at $(1-\theta_+)\,\Delta'$ iff $\Delta' > \frac{1-\theta}{1-\theta_+}\Delta\,(>\Delta)$ (even more widened asymmetry after selling data)
- Why? Consent reveals a better borrower pool, hurting profit from competition. So needs greater info wedge

Laissez-faire approach more likely to have perverse effect than regulation!

Multiple Fintechs

The number of lenders per se is not that relevant

- In models like ours, only two survive

Say two fintech lenders x'_{f1} and x'_{f2}

- After open banking, say both beat traditional bank so $x'_{fi} > x_b$
- If $\{x'_{fi}\}$ differ a lot, same logic implies perverse effect
  - Either because one of the fintechs is big-tech
  - Or fintechs are developing their own niche markets
- If $x'_{f1} \approx x'_{f2}$, then zero profit by fintechs and consumers gain. Most favorable situation from regulator's perspective

Extra complication with multiple Fintechs

- Say, type h borrowers may be discouraged from choosing certain fintechs due to equilibrium inference

Conclusion and Future Work

- Voluntary data sharing of open banking is not a silver bullet for consumer protection
  - Fostered competition benefits Fintech typically, though **borrowers can be all strictly worse off despite voluntary sign-up**
  - Rich forms of information externality with profound welfare implications
- Leveling the playfield. Policy design to fine tune data sharing
- Fintech in E-Commerce platforms and traditional banks
  - "Open platform" to level the playing field?