Competition and Scope in Banking: The Case of Small Business Lending

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- **How should we regulate multi-product firms?**

    - Regulating products from multi-product firms can have spillovers and unintended consequences in other markets/products $\rightarrow$ Distortions?

This Paper – Scope of Financial Intermediaries

- Scope is at the core of **what banks do**.

  - Traditional banks take short-term deposits and issue long-term loans
    $\rightarrow$ This maturity transformation function requires banks to have a wide scope.

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- Scope is also relevant for **competition and modern banking architecture**

  - In many markets, banks compete with non-bank financial intermediaries
    (e.g., fintech, P2P lenders).

  - Non-banks/fintechs are very specialized, often offering only one product.

  - Differences in scope and regulation between banks and their competitors.

Setting:

- Focus on the U.S. credit market for small/medium businesses.

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    - Term Loans: usually associated with investment.

    - Credit Cards: usually associated with liquidity.

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Data:

- Firm credit registry from Experian $\rightarrow$ New, very detailed data at the firm-product level.

- Data on *both* banks and non-banks/fintechs $+$ Excellent coverage for small businesses

Model of demand and supply of firm credit:

DEMAND: Firms have investment opportunities determining their optimal borrowing amounts.
Firms demand credit from lenders and choose credit products.

SUPPLY: Banks are multi-product, offering credit cards <u>and</u> term loans to firms.
Non-banks are single-product, offering credit cards <u>or</u> loans, but not both.

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⇒ Market Power: Differentiated products + Firm preferences for multi-product lenders

⇒ Multi-product Incentives: Lenders can distort quantity and product choices of firms.

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$\Rightarrow$ Steering reduces firm welfare, but less so than the benefits from cost synergies.

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⇒ Steering reduces firm welfare, but less so than the benefits from cost synergies.

Counterfactual 2: Homogeneous regulation across products and entities.

⇒ Pareto improving: both profits and firm welfare increase.

Bottom line: Regulation needs to account for the multi-product nature of banks, and how they interact with their unregulated, more specialized competitors.

Related Literature

- Economies of scope in banking → Focus on cost complementarities between loans and deposits (Diamond and Dybvig 1983; Kashyap, Rajan and Stein 2000; Gatev, Schuermann and Strahan 2009; Keister and Sanches 2019; Piazzesi and Schneider 2020; Norden and Weber 2010; Egan, Lewellen and Sunderam 2017; Aguirregabiria, Clark and Wang 2020; Mayordomo, Pavanini and Tarantino 2022; Albertazzi, Burlon, Jankauskas and Pavanini 2022)

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- Pricing and taxation of multi-product firms
  (Edgeworth, 1925; Amstrong and Vickers, 2018; Agrawal and Hoyt, 2019; D'Annunzio and Russo, 2022; Dubois, Griffith and O'Conell, 2020, 2022;)

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- Financial constraints limiting firm investment and being a barrier to small business growth
  (Evans and Jovanovic, 1989; Whited and Wu, 2006; Rauh, 2006; Kerr and Nanda, 2010; Barrot, 2016; Adelino et al., 2017, Buchak, 2020, Benmelech, Frydman, and Papanikolaou 2019, Bord et al., 2018, Chen et al., 2017, Gopal and Schnabl, 2020, Greenwald et al., 2020)

Credit Registry Data

Data I

Panel of Firm-Lender Relationships: Firm Credit Registry (Experian)

- **Time period:** March 2008 - September 2019

- **Coverage:** Almost 12 million U.S. firms with over 112 million credit products.
  Participating lenders include banks, non-banks and credit unions. `Summ Stats Lenders`

- **Products:** credit cards, term loans, credit lines and leases. `Summ Stats Products`

- **Variables:** Number of accounts, type, balances, limits, delinquencies, credit score, employment,
  sales and establishments. `Summ Stats Variables`

Data II

Price Data: RateWatch

- Interest rates on corporate credit cards and term loans.
- Rates for each lender, county and year. [Summ Stats Rates]

Mortgage Data: HMDA

- Mortgage originations for each lender, county and year.

Deposit and Branch Data: Call Reports

- Deposits for banks, county and year.
- Branch locations for banks, county and year.

Facts and Suggestive Evidence

(Quick Summary)

Do (Multi-Product) Banks Distort Firms' Credit Choices?

Industry Reports

"Often times, the biggest banks refer small businesses below certain revenue thresholds or seeking low dollar loans to their small business credit card products, which earn higher yields."

"Some banks, particularly larger banks, have significantly reduced or eliminated loans below a certain threshold... or simply will not lend to small businesses, as a way to limit time-consuming applications from small businesses."

— Gordon Mills and McCarthy, The State of Small Business Lending, 2014

- Basel III changed the risk weights associated with bank credit to small and medium companies.

- It made corporate credit cards relatively less costly (in terms of capital requirements) than term loans.

	Retail SME Term Loans	Retail SME Credit Cards	Corporate Term Loans
Basel II - SA	75%	75%	100%
Basel III - SA	75%	**45%**	**85%**

- How did banks react? How did their non-bank (non-regulated) competitors react?

Summary of Facts and Reduced-Form Evidence

- After an increase in the relative cost of small-size term loans, banks increased sales of credit cards and large-size term loans.

  - **Quantity distortion:** Bunching above \$50K loans for banks (and not for non-banks)

  - **Product distortion:** Excess mass of firms using 100% of credit card limit

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- Banks increased credit cards more in areas with:

  - Higher mortgage shares (commercial and residential)
  - **Economies of Scope?**

- Need a model to quantitatively understand how economies of scope, market power and banks' regulatory distortions affect welfare.

Model

1. Each firm i observes its investment opportunity $\hat{q}_i \rightarrow$ Optimal borrowing amount

   - Simple way to capture optimal capital structure in a reduced form way

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2. Lenders set interest rates for each of their products: term loans and credit cards.

   - Banks (multi-product) offer credit cards <u>and</u> term loans to firms.

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   - Simultaneous, banks choose how strongly to dis-incentivize small quantity term loans ("steering")

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3. Each firm chooses how much to borrow and a product from lenders.

Firm Credit Demand

- Firms have <u>heterogeneous preferences</u> (e.g., depending on their optimal loan size $\hat{q}_i$)

- Firm i chooses the product j from lender l in market m that maximizes its <u>indirect utility</u>:

$$U_{ijlm} = -\alpha\, r_{jlm} + X'_{jlm}\,\beta + \xi_{jlm} + (1-\sigma)\epsilon_{ijlm}$$

$$-\underbrace{1\left[\hat{q}_i < \overline{q}_{jlm}\right]}_{\text{Small borrower}}\left[\underbrace{\gamma_{jlm} \times 1[q_i^* = \hat{q}_i]}_{\text{Non-price steering}} + \underbrace{\lambda\left(\overline{q}_{jlm} - \hat{q}_i\right) \times 1[q_i^* = \overline{q}_{jlm}]}_{\text{Inefficiently sized large loan}}\right]$$

$$-\underbrace{\psi\, ln(\hat{q}_i) \times 1[j = CC]}_{\text{Large borrowing with cards}}$$

- **Observables:** r_{jlm} interest rates; X_{jlm} observable product characteristics, $\overline{q}_{jlm}$ product minimum quantities.

- **Unobservables:** ξ_{lmj} unobservable characteristics and common shocks; $(1-\sigma)\epsilon_{ilmj}$ T1EV shock, where σ correlation across products within nest (lender); $\hat{q}_i$ firm optimal quantities.

Lender Credit Supply

- Both banks and non-banks choose rates, r_{jlm}, to maximize expected profits.

- Simultaneously, banks (multi-product) also choose how much "steering" (γ_{jlm}) to do away from small-quantity term loans

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- **Lender markup/profit:**

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where lender's heterogeneous marginal costs are defined as a function of other products:

$$mc_{jlm} = \underbrace{Product_j \times (\overrightarrow{\eta}_1 Deposits_{jlm} + \overrightarrow{\eta}_2 Mortgages_{jlm} + \overrightarrow{\eta}_3 Other\ Products_{jlm})}_{\text{Synergies}} + \nu_L^S + \nu_j^S + \omega_{jlm}$$

Bank's trade-off in choice of steering γ

$(+)$ Higher γ and market power pushes firms towards own higher-markup products

$(-)$ Firms may choose competitors (extensive margin)

Intuition

Bank's trade-off in choice of steering γ

$(+)$ Higher γ and market power pushes firms towards own higher-markup products

$(-)$ Firms may choose competitors (extensive margin)

Firm's trade-off if $\hat{q}_i < \overline{q}_{jlm}$

1. Choose larger loan size and pay higher interest (**quantity distortion**)

2. Borrow through credit card (**product distortion**)

3. Stay in a small size loan but face potentially higher costs (γ).

Estimation

Estimation - Key Parameters

Parameters

- α: price sensitivity
- λ: penalty on quantity distortion
- ψ: coefficient on (loan size $\times$ card), capturing suboptimality of cards for large projects
- γ: distortion/steering away from small bank loans
- σ: nest parameter
- $\hat{q}_i \sim \log \mathcal{N}(\mu_{\hat{q}}, \sigma_{\hat{q}}^2)$: parametric assumption on firms' desired loan sizes
- mc_{jmt}: marginal costs
- η_1, η_2, η_3: cost synergies

Estimation

- BLP/Nested Logit + Additional Micro Moments + Lenders' FOCs
- IVs for endogenous (1) price, (2) within-group share, (3) share of deposits, and (4) share of mortgages

Estimated parameters

Parameter	Value	Interpretation
α	0.31	Elasticity $= 2.62$
σ	0.27	Within-lender elasticity $= 4.07$
λ	0.16	\$1k too-large $\approx$ 50 bps rate increase
$\bar{\gamma}$	0.19	Average steering $\approx$ 61 bps rate increase
ψ	1.47	1% larger size $\approx$ 474 bps higher rate
$\mu^{\hat{q}}$	9.42	\$31K average loan size
$\sigma^{\hat{q}}$	1.36	Standard deviation of \$71K

Supply Estimates

Estimated Mark-Ups					
	MEAN	SD	P10	P50	P90
Top 4 Banks					
Credit Cards	3.3	0.41	2.9	3.3	3.9
Large Term Loans	4.7	0.91	3.6	4.5	6
Small Term Loans	0.89	0.54	0.29	0.78	1.7
Other Banks					
Credit Cards	2.9	0.2	2.7	2.8	3.1
Large Term Loans	4.3	0.62	3.6	4.3	5.2
Small Term Loans	0.31	0.25	0.076	0.26	0.56
Non-Banks					
Credit Cards	3.9	0.35	3.6	3.8	4.3
Term Loans	3.6	0.064	3.5	3.6	3.7

- We also find that a 10% higher mortgage share in a market reduces marginal costs by 22% on average.

- We do not find that deposits reduce marginal costs.
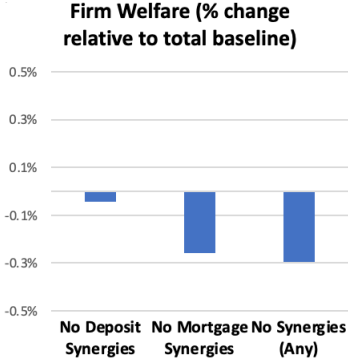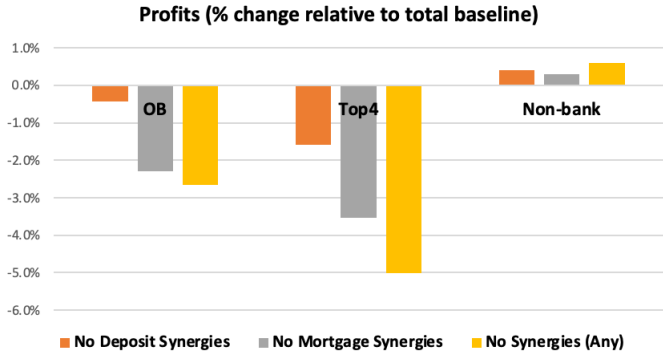
Counterfactuals

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1. Horse race between synergies and steering

   - Remove steering: Bank can no longer steer

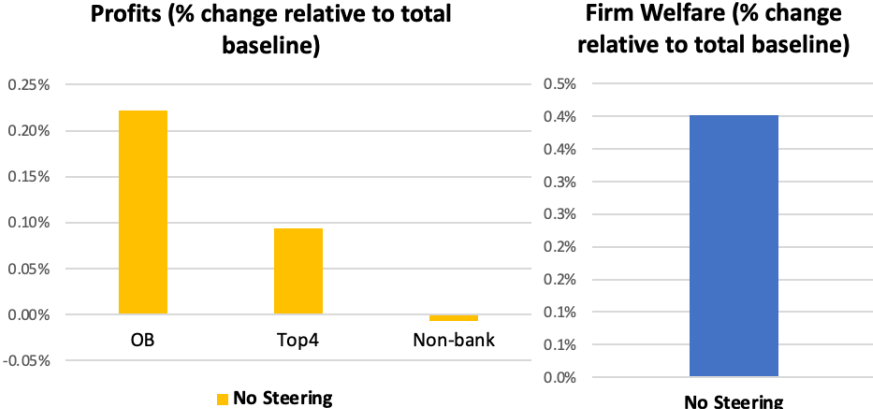   - Remove synergies: No cost synergies from mortgages, deposits, cards/loans

2. Remove heterogeneous regulation

   - Regulate equally banks and non-banks.
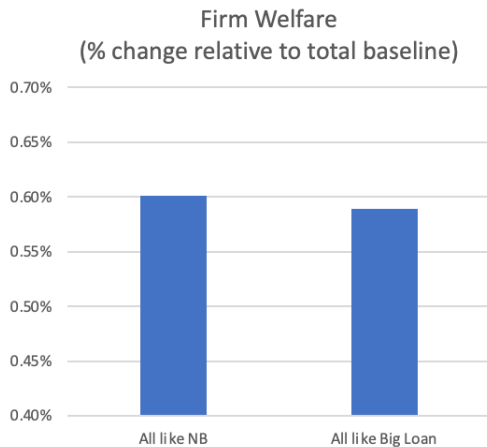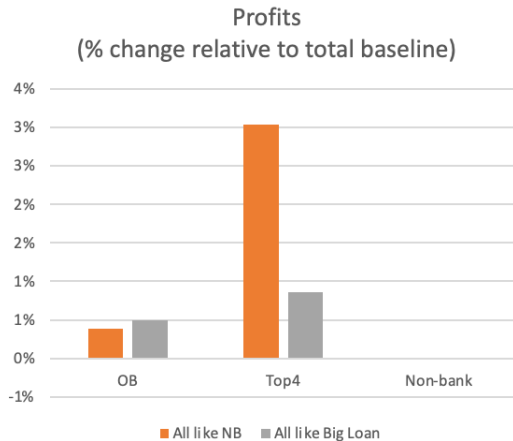
   - Regulate equally all products.

Synergies: Changes in Profits and Firm Welfare

Profits (% change relative to total baseline)

Firm Welfare (% change relative to total baseline)

Legend: No Deposit Synergies, No Mortgage Synergies, No Synergies (Any)

Profits (% change relative to total baseline)

Firm Welfare (% change relative to total baseline)

Regulation: Changes in Profits and Firm Welfare

Profits
(% change relative to total baseline)

Firm Welfare
(% change relative to total baseline)

■ All like NB ■ All like Big Loan

Bottom Line

- There is a trade-off of having financial intermediaries with wider scope.

    - Cost synergies, market power and product/quantity distortions are quantitatively important.

- We find that cost synergies across assets are quantitatively larger than between assets and liabilities.

    - Most of the literature has focused on asset-liability complementarities, but modern banks also face asset-to-asset complementarities.

- Regulation that does not account for the multi-product nature of banks can create distortions for firms.

Thank you very much for your comments!