The Role of Regulation and Bank Competition in Small Business Financing: Evidence from the Community Reinvestment Act

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CRESSE–September 4, 2021
1 Introduction

2 Literature review and contribution

3 Sketch of the theoretical model

4 Empirical Analysis

5 Conclusion
Despite the recent increase in bank competition, almost one third of small businesses still faces challenges with credit availability.

Furthermore, the financial constraints are much higher among minority owned businesses and businesses located in areas with lower income.

The economic prospects of these local markets are consequently undermined.

Facing bank financing constraints, small businesses turn to other more expensive methods to finance their operations, including trade credit.
Low institutional finance implies little information available about the creditworthiness of these small businesses.

This creates a **vicious cycle** of low funding, high proportions of opaque businesses and underfunded local markets.

Nevertheless, small businesses are crucial for **employment**, **growth** and **innovation** in many local markets.

To break this vicious cycle, policymakers have introduced **regulations** that force lenders to extend credit to targeted markets.

However, the **impact on borrowers**, targeted by these important regulations, remains largely **unexplored**.
Trade credit is the loan extended by one trader to another when the goods and services are bought on credit.

Trade credit is commonly used by business organizations as a source of short-term financing.

It is granted to those customers who have a reasonable amount of financial standing and goodwill.

Trade credit is more expensive than institutional finance.

Firms use less trade credit if they have access to institutional finance, Petersen and Rajan (JF, 1994) and Petersen and Rajan (RFS, 1997).
Main question: Do policies that promote credit access for small businesses have an impact on these firms?

We investigate the impact of these policies on:

- whether they improve a firm's trade credit score
- which is a strong indication that the small businesses use the new bank loans in place of the more expensive trade credit.

We develop a theoretical model of regulation and bank competition.

We test empirically its predictions by examining the impact of the Community Reinvestment Act's (CRA) lending program on small businesses.
The Community Reinvestment Act

- Enacted in 1977, the Act aims to meet the credit needs of the underfunded communities.

- Based on census data of median family income (MFI), CRA examiners divide tracts mainly into two groups:
  - the upper-middle tracts with MFI above 80% of the surrounding Metropolitan area’s MFI and
  - the low-moderate tracts with MFI ratio below 80%.

- Banks with branches in low-moderate tracts, the CRA eligible communities, are subject to periodic assessment by regulators in meeting the credit needs of these communities.
Empirical methodology

- We use the *fuzzy regression-discontinuity (RD) design*. 

- We examine if loans in *newly eligible tracts* are higher compared to loans in the *ineligible tracts*, around the 80% cut-off.

- Then, we examine whether these *additional* loans had a real impact, by looking at the *Dun & Bradstreet paydex score*.
  
  - The PAYDEX Score is a dollar-weighted indicator intended to reflect a business's past payment performance with respect to its trade credit lines.

  - A higher paydex score of a firm is linked to more favorable trade credit agreements for the small businesses.

  - Hence, a higher trade credit score can imply economic improvement for the local market.
Main findings

- Loans increased in the newly eligible tracts.

- The trade credit score of businesses also increased, on average.
  - Firms use the new loans to pay off their trade credit at or before the due date to take advantage of price discount.

- However, in local markets characterized by strong bank competition, we do not observe an increase in the trade credit score.
  - Banks in those markets have access to bank funding, even in the absence of regulation.

- The trade credit score improvement is observed predominantly among firms operating in more trade credit-dependent sectors of the economy.
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**Literature review**

- **Trade credit**: Petersen and Rajan (JF, 1994), Petersen and Rajan (RFS, 1997), Biais and Gollier (RFS, 1997) and Fishman and Love (JF, 2003).

- **Small business lending**: Berger, Saunders, Scalise and Udell (JFE, 1998); Black and Strahan (JF, 2002); Cetorelli and Strahan (JF, 2006); Rice and Strahan (JF, 2010).

- **Impact of CRA**:
  
  - **Residential mortgages**: Dahl, Evanoff and Spivey (JMCB, 2010); Bhutta (JLE, 2011); Agarwal, Benmelech, Bergman and Seru (WP, 2012); Avery and Brevoort (ReStat, 2015); Ding and Nakamura (WP, 2020); Begley and Purnanandam (JFE, 2021).

  - **Small businesses**: Avery, Bostic and Canner (HPD, 2005); Bostic and Lee (Cityscape, 2017); Ding, Lee and Bostic (WP, 2018).
Contribution

- Theoretical model of bank competition and regulation.

- Most of the CRA literature has focused on whether the regulation has been effective in increasing the quantity of loans.

- We go a step further and examine whether the new loans have positively impacted the targeted small businesses’ creditworthiness.

- We highlight the moderating role of markets’ micro-structure on the impact of the CRA.
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Assumptions

- There is a continuum of identical small businesses located uniformly around the Salop (Bell, 1979) circle.

- Each firm can borrow from a bank at $r_L$, or has an option to borrow by paying trade credit late at an effective interest rate equal to $r_T$.

- Each firm has an elastic demand for credit: $B(r_i) = a - br_i$, where $i = T, L$.

- There are $n \geq 2$ banks symmetrically located around the circle.

- Each business owner incurs a linear “traveling” cost of $t_L$ per distance traveled to apply for a loan at one of the banks.

- Banks’ cost of funding loans is denoted as $r_F$. 
It is assumed that

\[ r_F < r_T \]

so that banks can make profitable loans to at least some firms.

If a firm is a distance \( x \) from a bank that charges a loan interest rate of \( r_L \), the firm will choose to borrow from the bank if

\[ B(r_L) - xt > B(r_T). \]

Otherwise, the firm will prefer to borrow using trade credit.
There are in general two kinds of equilibria:

1. Competitive
2. Local monopoly.

When $n$ is high, all firms borrow from a bank: competitive equilibrium.

When $n$ is low, some firms use trade credit instead of borrowing from a bank: local monopoly equilibrium.

So, when local bank competition is weak, there are *unbanked* small businesses.
The effect of a regulation

- The CRA regulation seeks to increase bank lending to low income areas.

- If a market becomes CRA-eligible
  - in **high competition markets**: banks increase lending but all firms are already using bank loans
  - in **low competition markets**: banks increase lending but some of these loans go to unbanked firms who use them to pay off the trade credit lines sooner.

- Our model predicts that the trade credit score will increase in low bank competition markets.
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**Data**

- **CRA small business loan data** is obtained from the Federal Financial Institutions Examination Council (FFIEC).
  - We focus on small business loans with origination amounts of $1 million or less.

- **Business data** is obtained from the National Establishment Time Series (NETS).
  - Focus is on establishments that meet SBA's definition of small business.

- **Bank branch data** come from the Summary of Deposits (SOD), the annual survey of branch office deposits for all FDIC-insured institutions.

- To assign establishments and bank branches to census tracts, we perform **geocoding** from an establishment/bank branch latitude and longitude.
Our sample covers the period 2011-2012.

Median Family Income MFI data is updated every ten years based on census data.

CRA performance data in 2011 was based on the 2000 census information and data in 2012 was conducted using 2010 census data.

As a result, approximately 15 percent of the tracts that were marginally middle-upper income in the 2000 census moved to the moderate-low-income classification in the 2010 census.

We focus on these newly eligible tracts to avoid any confounding effect from relationship lending on the trade credit score of businesses.
Table: CRA eligibility and small business lending growth

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>All tracts (1)</th>
<th>Low bank competition tracts (2)</th>
<th>High bank competition tracts (3)</th>
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<td>0.341***</td>
<td>0.267***</td>
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<td>(0.0212)</td>
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<td>0.344***</td>
<td>0.272***</td>
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<td>0.236***</td>
<td>0.323***</td>
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<td>0.250***</td>
<td>0.344***</td>
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<td>0.367***</td>
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<td>[.296 ; .393]</td>
<td>[.223 ; .32]</td>
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<td>17.823</td>
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Note: The outcome variable is the probability of an unexpected surge in small business loans. An unexpected surge is defined as an increase of at least 20% either in the number or in the total amount of the small business loan.
Regulation and small businesses credit score

Figure: The credit score discontinuity at the cut off point of 80% in the median family income ratio
### Table: Effect of CRA regulation on firm’s trade credit score

#### Panel A: Paydex score

<table>
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<tr>
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<td>(0.568)</td>
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<td>1.308**</td>
<td>1.400**</td>
<td>1.698***</td>
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<td>(0.583)</td>
<td>(0.568)</td>
<td>(0.484)</td>
<td>(0.495)</td>
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<tr>
<td>Robust</td>
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<td>1.400**</td>
<td>1.698***</td>
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#### Panel B: Proportion of firms with score > 70

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<td>0.0331**</td>
<td>0.0353***</td>
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<td>Robust</td>
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Regulation, bank competition and small businesses credit score

Low bank competition

High bank competition

Mean Paydex Score

Median Family Income Ratio %

Low bank competition

High bank competition

% of firms with Paydex Score > 70

Median Family Income Ratio %

Low bank competition

High bank competition

% of firms with Paydex Score > 70

Median Family Income Ratio %
The role of bank competition

### Table: Bank competition and the effect of CRA regulation on firm's credit score

#### Panel A: Paydex score

<table>
<thead>
<tr>
<th>VARIABLES</th>
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<tr>
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<td>(0.580)</td>
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<td>(0.671)</td>
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- Observations: 49461 10292 21021 3550
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- Kernel Type: Epanechnikov Epanechnikov Epanechnikov Epanechnikov
- BW Type: msrd msrd msrd msrd
- Sample: Total Matched Total Matched
- Order Loc.Poly.(p): 1.00 1.00 1.00 1.00
- Order Bias(q): 2.000 2.000 2.000 2.000

#### Panel B: Proportion of firms with score >70

<table>
<thead>
<tr>
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<th>High bank competition tracts</th>
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</thead>
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<td>0.0343**</td>
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- Observations: 49461 10292 21021 3550
- Robust 95% CI: [.001 ; .068] [.003 ; .065] [-.035 ; .111] [-.023 ; .098]
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- BW Type: msrd msrd msrd msrd
- Sample: Total Matched Total Matched
- Order Loc.Poly.(p): 1.00 1.00 1.00 1.00
- Order Bias(q): 2.000 2.000 2.000 2.000
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Conclusion

- We provide evidence of the **positive** impact of CRA's small business lending program on the **trade credit score** of businesses located in low and moderate income communities.

- Small businesses use the CRA-induced loans to substitute for the more expensive trade credit.

- This is more pronounced in markets characterized by weak local bank competition.

- Policy recommendations:
  - Regulation can **complement** competition to promote access of small businesses to bank loans.
  - This complementarity is stronger in markets characterized by weak bank competition.
Thank you!

Q&A