Going online? The motive of firms to borrow from the crowd

Jieying Li

Stockholm School of Economics
Swedish House of Finance

Financial Innovation Conference, Washington D.C.
December 2nd, 2016
Credit conditions for small businesses remain difficult

Credit application outcomes

<table>
<thead>
<tr>
<th>Category</th>
<th>Financial short falls</th>
<th>Fully funded</th>
</tr>
</thead>
<tbody>
<tr>
<td>All firms</td>
<td>50%</td>
<td>50.0%</td>
</tr>
<tr>
<td>1–9 employees</td>
<td>55%</td>
<td>45.0%</td>
</tr>
<tr>
<td>10–49 employees</td>
<td>41%</td>
<td>59.0%</td>
</tr>
<tr>
<td>50+ employees</td>
<td>28%</td>
<td>72.0%</td>
</tr>
<tr>
<td>&lt;$100K</td>
<td>63%</td>
<td>37.0%</td>
</tr>
<tr>
<td>$100K–$1M</td>
<td>55%</td>
<td>45.0%</td>
</tr>
<tr>
<td>$1M–$10M</td>
<td>37%</td>
<td>63.0%</td>
</tr>
<tr>
<td>&gt;$10M</td>
<td>27%</td>
<td>73.0%</td>
</tr>
</tbody>
</table>

Motivation

Banks are the dominant credit source but online lending is becoming important, especially for smaller size firms.

Credit source by application

- **All firms**: Large bank - 20%, Small bank - 23%, Online lender - 15%, Other source - 4%
- **1–9 employees**: Large bank - 20%, Small bank - 23%, Online lender - 15%, Other source - 4%
- **10–49 employees**: Large bank - 20%, Small bank - 23%, Online lender - 15%, Other source - 4%
- **50+ employees**: Large bank - 20%, Small bank - 23%, Online lender - 15%, Other source - 4%
- **<$100K**: Large bank - 20%, Small bank - 23%, Online lender - 15%, Other source - 4%
- **$100K–$1M**: Large bank - 20%, Small bank - 23%, Online lender - 15%, Other source - 4%
- **$1M–$10M**: Large bank - 20%, Small bank - 23%, Online lender - 15%, Other source - 4%
- **>$10M**: Large bank - 20%, Small bank - 23%, Online lender - 15%, Other source - 4%

Research question

Small businesses

Credit institutions

Investors
Research question

Small businesses → Credit institutions → investors

Crowd-lending
Research question

- What type of firms borrow from the crowd?
Research question

- What type of firms borrow from the crowd?
- Why do they go to crowdlending platforms for credit?
Research question

• What type of firms borrow from the crowd?
• Why do they go to crowdlending platforms for credit?
• How is the loan priced in the crowdlending market?
Methodology

- Investigate the determinants of a firm’s decision to borrow from the crowd
Methodology

• Investigate the determinants of a firm’s decision to borrow from the crowd

Treatment group

• Firms borrowing from the crowd (Toborrow)
Methodology

- Investigate the determinants of a firm’s decision to borrow from the crowd

**Treatment group**
- Firms borrowing from the crowd (Toborrow)

**Benchmark group**
- Firms borrowing from credit institutions
Methodology

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- Firms borrowing from credit institutions
  - All limited liability firms in Sweden
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  • Firms borrowing from credit institutions
    • All limited liability firms in Sweden
    • Exclude public firms
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  - Exclude public firms
  - Exclude private firms issued corporate bonds
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**Benchmark group**
- Firms borrowing from credit institutions
  - All limited liability firms in Sweden
  - Exclude public firms
  - Exclude private firms issued corporate bonds
  - Keep firms with increasing debts to credit institutions
Methodology

- Investigate the determinants of a firm’s decision to borrow from the crowd

**Treatment group**
- Firms borrowing from the crowd (Toborrow)

**Benchmark group**
- Private limited liability firms borrowing from credit institutions but without bond issuance

**Ex ante firm characteristics**
Methodology

- Investigate the determinants of a firm’s decision to borrow from the crowd

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- **Ex ante firm characteristics**
- **Regional factors**
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- Ex ante firm characteristics
- Regional factors
  - Bank accessibility (# bank branches pc)
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**Regional factors**
- Bank accessibility (# bank branches pc)
- “Stigma”: e.g., bankruptcy rate; criminal rate
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• Private limited liability firms borrowing from credit institutions but without bond issuance

• Ex ante firm characteristics
• Regional factors
  • Bank accessibility (\# bank branches pc)
  • "Stigma": e.g., bankruptcy rate; criminal rate
  • House price growth
• Incorporated in September 2013
• Largest crowdlending to businesses platform in Sweden
• By 1\textsuperscript{st} May, 2016: 68 campaigns, 3000 investors

• Overview of campaigns
  • Firms borrow on average 605,000 SEK, with 19 months maturity
  • Most firms borrow for investment and business expansion, choose to amortize, use personal guarantees other than firm collateral
  • Average interest rate 8.8\%
Firm characteristics

\[ Pr(\text{Crowdlending}_{it+1} = 1) = F(\text{FirmCharacteristics}_{it} \beta_f + \gamma \text{Year}_t + \delta \text{Industry}_i) \]
Firm characteristics

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- \( \ln(\text{sales}) \)
- Firm age
- Profitability: ROA
- Investment
- Sales growth
- Debt ratio
- Tangible/Fixed assets
- Cash holdings
- Pledged/Tangible assets
Firm characteristics

\[ Pr(\text{Crowdlending}_{it+1} = 1) = F( \text{FirmCharacteristics}_{it} \beta_f + \gamma \text{Year}_t + \delta \text{Industry}_i ) \]

- \( \ln(\text{sales}) \quad +/- \)
- Firm age \quad +/-
- Profitability: ROA \quad +/-
- Investment \quad -
- Sales growth \quad + *
- Debt ratio \quad -
- Tangible/Fixed assets \quad - ***
- Cash holdings \quad - *
- Pledged/Tangible assets \quad + **
Regional factors

$Pr(Crowdlending_{it+1} = 1) = F(\text{RegionCharacteristics}_{ct}\beta_r$

$ + X_{it}\beta_f + \gamma Year_t + \delta Industry_i)$
Regional factors

\[
Pr(\text{Crowdlending}_{it+1} = 1) = F(\text{RegionCharacteristics}_{ct} \beta_r \\
+ X_{it} \beta_f + \gamma \text{Year}_t + \delta \text{Industry}_i)
\]

At municipal level

- Bank branches pc
- Bankruptcy rate
- Criminal rate: total
- Criminal rate: economic
- Criminal rate: against creditors
- House price growth
Regional factors

\[ Pr(Crowdlending_{it+1} = 1) = F \left( RegionCharacteristics_{ct} \beta_r + X_{it} \beta_f + \gamma Year_t + \delta Industry_i \right) \]

At municipal level

- Bank branches pc 
- Bankruptcy rate
- Criminal rate: total
- Criminal rate: economic
- Criminal rate: against creditors
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+/-

+ *

+ **

+
Why borrow from the crowd?

- Firms borrow from the crowd
  - Higher growth rates
  - Demand external funding
  - Lack of enough pledgeable assets
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- Two mechanisms
  - Credit rationed by banks
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  - Demand external funding
  - Lack of enough pledgeable assets

- Two mechanisms
  - Credit rationed by banks
  - Alternative source for cheaper credit
Why borrow from the crowd?

- Alternative source for cheaper credit?

**Average loan rate on Toborrow vs. New bank loan rate**

_July 2014-February 2016_

Notes: The new bank loan rates are the average lending rates to all non-financial firms.

Why borrow from the crowd?

- Alternative source for cheaper credit?

**Reasons for dissatisfaction with online lenders**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High interest rate</td>
<td>70%</td>
</tr>
<tr>
<td>Unfavorable repayment terms</td>
<td>51%</td>
</tr>
<tr>
<td>Difficult application process</td>
<td>21%</td>
</tr>
<tr>
<td>Long wait for credit decision</td>
<td>22%</td>
</tr>
<tr>
<td>Lack of transparence</td>
<td>32%</td>
</tr>
</tbody>
</table>

Why borrow from the crowd?

- Credit rationed by banks?

Credit supply becomes major obstacle for firms to grow

—Share of small businesses in the past three years, applied for but were not granted loans

Source: The Swedish Agency for Economical and Regional Growth
Why borrow from the crowd?

• Credit rationed by banks?

• Insufficient collateral is the No.1 reason for credit denial

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<thead>
<tr>
<th>Reasons for credit denial</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Insufficient collateral</td>
<td>32%</td>
</tr>
<tr>
<td>Weak business performance</td>
<td>30%</td>
</tr>
<tr>
<td>Low credit score</td>
<td>28%</td>
</tr>
<tr>
<td>Insufficient credit history</td>
<td>28%</td>
</tr>
<tr>
<td>Other</td>
<td>27%</td>
</tr>
<tr>
<td>Unsure</td>
<td>19%</td>
</tr>
<tr>
<td>Inadequate documentation</td>
<td>3%</td>
</tr>
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Why borrow from the crowd?

• Credit rationed by banks?
  • Tightened regulation on the banking sector after the financial crisis
Why borrow from the crowd?

• Credit rationed by banks?
  • Tightened regulation on the banking sector after the financial crisis
  • Banks are more willing to allocate credit supply to mortgagors considering the booming housing market in Sweden
Determinants of loan price

P2P lending to consumers
• Financial information such as credit score, DTI ratio (e.g. Iyer et al., 2015; Klafft, 2008)
• Demographic information such as gender, race, age, etc. (e.g. Duarte et al., 2012; Herzenstein et al., 2008; Michels, 2012; Pope and Sydnor, 2011; Ravina, 2012)
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P2B lending to businesses
• Financial information
• Key firm financials exposed to investors on the platform
• Loan terms and credit info
• Non-financial information
• Campaign representative profile
• # representatives
• Owner/CEO showing up?
• Female vs male
• With photos?
• Campaign related info
• Raising first time?
• Timing of campaign
• Length of campaign
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Determinants of loan price

\[ \text{InterestRate}_i = \alpha + \mathbf{X}_i \beta + \epsilon_i \]

**Financial information**

- \( \ln(\text{sales}) \)
- ROA
- Debt ratio
- **Current/Total Assets**
- Firm age
- Quick ratio
Determinants of loan price

\[ \text{InterestRate}_i = \alpha + X_i \beta + \epsilon_i \]

Loan terms and credit info

- **Loan size**  \[+***\]
- **Maturity**  \[+**\]
- **Collateral**  [-]
- **Amortization**  [-]
- **Risk Score**  \[+**\]
Determinants of loan price

\[ \text{InterestRate}_i = \alpha + \mathbf{X}_i \beta + \epsilon_i \]

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Conclusion

• Crowdlending is an important alternative financing source for small businesses
  • With high growth rate but lack internal funds and enough collateral
  • Located in regions with higher bankruptcy and criminal rates
• Price of crowdlending loans to businesses are determined by firms’ standard financial information
Contribution

To literature

• Crowdfunding: first direct evidence linked to traditional financial intermediation; lending-based format

• Small business financing: evidence from a new online market

• Lender choice: private vs. public debts for small businesses

To policy

• A reference point for regulating crowdfunding market
”...a proportionate potential regulatory approach should be considered, to both promote the growth of crowdfunding, as an alternative source of funding, and ensure market confidence and provide safeguard of the participants.”

– Opinion of the European Banking Authority on lending-based crowdfunding, EBA, 26 February 2015
Thank you!


Hildebrand, Thomas, Manju Puri, and Jörg Rocholl, 2016, Adverse incentives in crowdfunding, Management Science, forthcoming.


Appendix
Data Source

- Firm registration and financial information: Serrano
- Regional factors at municipal level
  - GDP, geographical category, population, Consumption etc.: Statistics Sweden (SCB) and HUI research institution
  - Criminal rate: Swedish National Council for Crime Prevention
  - Bank branches: Hand-collected
  - Bankruptcy rate: Computed from Serrano
- Project campaigns, loan characteristics and bids: Toborrow
Determinants of loan costs
Crowdlending platforms in Sweden

<table>
<thead>
<tr>
<th>Business model</th>
<th>Toborrow</th>
<th>FundedByMe</th>
<th>Kameo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Debt-based only</td>
<td>Mainly Reward- and equity-based only</td>
<td>Debt-based only</td>
</tr>
<tr>
<td>Investors</td>
<td>Sweden</td>
<td>International</td>
<td>Sweden</td>
</tr>
<tr>
<td>Borrowers</td>
<td>Sweden</td>
<td>Sweden, Germany</td>
<td>Sweden</td>
</tr>
<tr>
<td>Registration</td>
<td>17/09/2013</td>
<td>08/11/2011</td>
<td>02/10/2014</td>
</tr>
<tr>
<td>Pricing model</td>
<td>Discriminatory-price auction</td>
<td>Platform mandated posted price</td>
<td></td>
</tr>
<tr>
<td># campaigns(^a)</td>
<td>68</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

\(^a\) # campaigns are updated by 1\(^{st}\) May, 2016.
Two marketplaces aimed at SMEs:
- Nasdaq OMX First North Bond Market, since 2012
- RänteTorget, launched by AktieTorget in 2013

Issuing costs: bond vs. crowdlending

<table>
<thead>
<tr>
<th>Example</th>
<th>First North</th>
<th>Räntetorget</th>
<th>Toborrow</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 MSEK loan listing for 3 years</td>
<td>45,000</td>
<td>506,000</td>
<td>80,000</td>
</tr>
<tr>
<td>1 MSEK loan listing for 1 year</td>
<td>NA</td>
<td>185,000</td>
<td>20,000</td>
</tr>
<tr>
<td>0.2 MSEK loan listing for 1 year</td>
<td>NA</td>
<td>NA</td>
<td>4,000</td>
</tr>
</tbody>
</table>