The Impact of Foreign Bank Deregulation on Firm Performance: Evidence from China

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Beihang University

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UIBE SBF Seminar
Recently, foreign bank participation has increased tremendously in developing countries. (Claessens and Van Horen, 2014)

- increase supply of bank credit to all borrowers
- improve the efficiency of the banking system in host country via banking competition

I study the impact of foreign bank deregulation policy in China (2001-2006)

- China: different from Russia and East Europe
- gradual financial opening policy over time across different cities
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Research Questions

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2. What were the possible channels through which the deregulation policy worked?
   - relax financial constraints for previously constrained firms
   - increase banking sector competition
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This Paper

- Explores variation in the timing of deregulation policy across cities
  - city-level variation regarding *when* foreign banks can lend to domestic borrowers

- Uses manufacturing census data to evaluate the impact of foreign bank entry on firms
  - focusing on differential effects on firms within the same city but with different levels of financial constraints
  - state-owned firms vs. private-owned firms
  - private firms are more financially constrained (Song et al., 2011 AER)
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Main Findings

- Private-owned firms benefited more from increased credit access, increased investment and sales, relative to state-owned firms following foreign bank deregulation in a given city.

- Banking sector liberalization policy on foreign bank lending helps alleviate financial constraints of some firms, especially those private-owned firms.

- Reverse the effects of financial repression
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- Reverse the effects of financial repression.
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   - Related Literature

2. **Institutional Background**  
   - Policy Experiment  
   - Foreign Bank Activities Overview

3. **Data and Methodology**  
   - Firm-level Data  
   - State-owned vs. Private Firms  
   - Financial Opening  
   - Empirical Strategy

4. **Empirical Analysis**  
   - Differential Effects across Firms  
   - Bank Competition Channel  
   - Robustness Checks

5. **Conclusion**
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5 Conclusion
“Natural experiments” of financial reforms

- Forbes (2007): capital control in Chile
- Amiti and Weinstein (2011): Japan real estate bubble
- Fan and Kalemli-Ozcan (2015): country-level financial reforms in emerging Asia

This paper focuses on one type of financial reform

- within-country city-level foreign bank deregulation
  - panel variation in deregulation policy
  - state-level bank branching deregulation in US
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Banking deregulation: US vs. China

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<tr>
<th>Morgan, Rime, Strahan (2004)</th>
<th>My research</th>
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<td><strong>Geographic coverage</strong></td>
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<td>allow interstate bank entry</td>
<td>allow foreign bank entry</td>
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<td><strong>Decision maker</strong></td>
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<td>state legislation</td>
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<td><strong>Main effect</strong></td>
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<tr>
<td>more bank integration</td>
<td>more credit supply + competition</td>
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<td><strong>Deregulation timing</strong></td>
<td></td>
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<tr>
<td>gradually across states</td>
<td>gradually across cities</td>
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<td><strong>Outcome</strong></td>
<td></td>
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<td>state-level growth fluctuations</td>
<td>firm-level credit access/investment</td>
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<td><strong>Time</strong></td>
<td></td>
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<td><strong>Observation</strong></td>
<td></td>
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<tr>
<td>state-year</td>
<td>firm-year</td>
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<tr>
<td><strong>Control FE</strong></td>
<td></td>
</tr>
<tr>
<td>state, year FE</td>
<td>city(-year), industry-year, firm FE</td>
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Impact of foreign bank entry

- Claessens et al. (2001), Clarke et al. (2006)
  - cross-country analysis
  - rely on aggregate measures of foreign bank presence
  - key finding: firms become less credit constrained in countries with more foreign bank participation

- This paper: city-level foreign bank entry policy
  - more accurate measurement of foreign bank presence
  - within-country micro-level analysis is better to control for other macro events
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<td>Conclusion</td>
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- only conduct limited foreign currency business

At the end of 2001, the Chinese central government agreed to gradually remove restrictions on foreign banks’ lending to local customers in local currency.

Definition: “foreign bank entry/deregulation” means

- foreign banks were allowed to lend to domestic firms or banks in local currency in the same city (policy dummy)
Before foreign bank deregulation in 2001

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Deregulation details: 2001-2006

- **Stage 2:** During 2001 to 2006,
  - a group of cities opened to “foreign bank entry” in each year
  - foreign banks can enter 20 cities in total by 2006
  - foreign banks in one city *can not* lend to domestic customers in any other city that has not opened yet
  - effect of foreign bank entry is localized, *no spillover effect*

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Cities opened to foreign bank before 2006
Gradual liberalization - geographic timeline

<table>
<thead>
<tr>
<th>Time</th>
<th>Cities opened to foreign banks</th>
<th># opened cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>the end of 2001</td>
<td>Shanghai, Shenzhen, Tianjin, Dalian</td>
<td>4</td>
</tr>
<tr>
<td>the end of 2002</td>
<td>Guangzhou, Zhuhai, Qingdao, Nanjing, Wuhan</td>
<td>9</td>
</tr>
<tr>
<td>the end of 2003</td>
<td>Jinan, Fuzhou, Chengdu, Chongqing</td>
<td>13</td>
</tr>
<tr>
<td>the end of 2004</td>
<td>Beijing, Kunming, Xiamen</td>
<td>16</td>
</tr>
<tr>
<td>the end of 2005</td>
<td>Shantou, Ningbo, Shenyang, Xi’an</td>
<td>20</td>
</tr>
<tr>
<td>the end of 2006</td>
<td>All the other regions</td>
<td>all cities</td>
</tr>
</tbody>
</table>

Source: See page 34 of the document WT/ACC/CHN/49/Add.2, which is available at [http://www.wto.org/english/thewto_e/acc_e/completeacc_e.htm](http://www.wto.org/english/thewto_e/acc_e/completeacc_e.htm)
## Policy Experiment

Foreign investments in Chinese local banks

<table>
<thead>
<tr>
<th>Date</th>
<th>City</th>
<th>Local bank</th>
<th>Foreign investor</th>
<th>Deal size</th>
<th>% share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 2002</td>
<td>Shanghai</td>
<td>Pudong Dev. Bank</td>
<td>Citibank</td>
<td>$67 mil.</td>
<td>4.62%</td>
</tr>
<tr>
<td>Nov 2002</td>
<td>Nanjing</td>
<td>Bank of Nanjing</td>
<td>IFC</td>
<td>$27 mil.</td>
<td>15%</td>
</tr>
<tr>
<td>Dec 2002</td>
<td>Shanghai</td>
<td>Bank of Shanghai</td>
<td>HSBC</td>
<td>$62.6 mil.</td>
<td>8%</td>
</tr>
<tr>
<td>Dec 2002</td>
<td>Shanghai</td>
<td>Bank of Shanghai</td>
<td>IFC</td>
<td>$55 mil.</td>
<td>7%</td>
</tr>
<tr>
<td>Jan 2003</td>
<td>Xiamen</td>
<td>Xiamen International banks</td>
<td>Asian Dev. Bank</td>
<td>$16 mil.</td>
<td>10%</td>
</tr>
<tr>
<td>Mar 2004</td>
<td>Shenzhen</td>
<td>Ping An Bank</td>
<td>HSBC</td>
<td>$20 mil.</td>
<td>27%</td>
</tr>
<tr>
<td>Mar 2004</td>
<td>Fuzhou</td>
<td>China Industrial Bank</td>
<td>Hang Seng Bank</td>
<td>$125 mil.</td>
<td>15.98%</td>
</tr>
<tr>
<td>Mar 2004</td>
<td>Fuzhou</td>
<td>China Industrial Bank</td>
<td>Singapore Gov. Inv.</td>
<td>$42 mil.</td>
<td>5%</td>
</tr>
<tr>
<td>Mar 2004</td>
<td>Fuzhou</td>
<td>China Industrial Bank</td>
<td>IFC</td>
<td>$33 mil.</td>
<td>4%</td>
</tr>
<tr>
<td>Oct 2004</td>
<td>Xi’an</td>
<td>Bank of Xi’an</td>
<td>IFC</td>
<td>$19.9 mil.</td>
<td>12.5%</td>
</tr>
<tr>
<td>Oct 2004</td>
<td>Xi’an</td>
<td>Bank of Xi’an</td>
<td>Bank of Nova Scotia</td>
<td>$7 mil.</td>
<td>5%</td>
</tr>
<tr>
<td>Mar 2005</td>
<td>Beijing</td>
<td>Bank of Beijing</td>
<td>ING</td>
<td>$274 mil.</td>
<td>19.9%</td>
</tr>
</tbody>
</table>
## Foreign investments in Chinese local banks (Continued)

<table>
<thead>
<tr>
<th>Date</th>
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<th>Foreign investor</th>
<th>Deal size</th>
<th>% share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 2005</td>
<td>Beijing</td>
<td>Bank of Beijing</td>
<td>IFC</td>
<td>$70 mil.</td>
<td>5%</td>
</tr>
<tr>
<td>Apr 2005</td>
<td>Hangzhou</td>
<td>Bank of Hangzhou</td>
<td>Commonwealth Bank</td>
<td>$76 mil.</td>
<td>19.9%</td>
</tr>
<tr>
<td>Sep 2005</td>
<td>Tianjin</td>
<td>China Bohai Bank</td>
<td>Standard Chartered</td>
<td>$123 mil.</td>
<td>19.9%</td>
</tr>
<tr>
<td>Jan 2006</td>
<td>Ningbo</td>
<td>Bank of Ningbo</td>
<td>OCBC Bank</td>
<td>$70.7 mil.</td>
<td>12.2%</td>
</tr>
<tr>
<td>Mar 2006</td>
<td>Beijing</td>
<td>Huaxia Bank</td>
<td>Deutsche Bank</td>
<td>$330 mil.</td>
<td>13.98%</td>
</tr>
<tr>
<td>Sep 2006</td>
<td>Guangzhou</td>
<td>Guangfa Bank</td>
<td>GE Capital</td>
<td>$100 mil.</td>
<td>7.11%</td>
</tr>
<tr>
<td>Dec 2006</td>
<td>Chongqing</td>
<td>Bank of Chongqing</td>
<td>Dahsing Bank</td>
<td>$87 mil.</td>
<td>17%</td>
</tr>
<tr>
<td>Jun 2007</td>
<td>Qingdao</td>
<td>Bank of Qingdao</td>
<td>Intesa Sanpaolo Rothschilds</td>
<td>$50 mil.</td>
<td>19.5%</td>
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Source: Author’s collection from bank websites and news
1 Introduction
   • Related Literature

2 Institutional Background
   • Policy Experiment
   • Foreign Bank Activities Overview

3 Data and Methodology
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   • Financial Opening
   • Empirical Strategy

4 Empirical Analysis
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   • Robustness Checks

5 Conclusion
Foreign bank activities in China (boom in 2002-2006)

Source: Almanac of China’s Finance and Banking (2007), Xu (2011)
Foreign bank activities overview: country-level vs. city-level

<table>
<thead>
<tr>
<th>Year</th>
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<tbody>
<tr>
<td>Number of foreign bank branches</td>
<td>171</td>
<td>188</td>
<td>207</td>
<td>224</td>
<td>274</td>
</tr>
<tr>
<td>Growth of foreign bank assets (%)</td>
<td>-</td>
<td>40.0</td>
<td>22.9</td>
<td>29.7</td>
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Source: China Banking Regulatory Commission (2010)

- Country-level: share of foreign bank loans seems small, 3-5%.

- However, foreign bank activities are concentrated in a few cities.
  - Foreign banks issued more than 40% of new RMB loans in Shanghai in 2006. (XinHua News, December 8, 2006)
  - Domestic banks had lost 40% of their customers in Beijing, Shanghai and Guangzhou since 2003. (China Business Times, April 30, 2007)

- In addition, foreign banks made equity investment in domestic banks and firms could benefit from foreign bank entry indirectly.
Foreign bank activities: country-level vs. city-level

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**Introduction**

**Institutional Background**

**Data and Methodology**

**Empirical Analysis**

**Conclusion**

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**Firm-level Data**

**Data source**

  - used by Hsieh and Klenow (2009 QJE)
  - similar to the Longitudinal Business Database (LBD) in US
    - all state-owned enterprises (SOEs)
    - all non-SOE with sales > 5 million RMB ($600,000)
  - unbalanced panel, covering 90% of industrial GDP in 2004

- The unit of observation is a firm (unconsolidated)
  - e.g. Toyota Beijing and Toyota Shanghai→2 “firms”
  - 96.6% of observations are single-plant
Annual surveys of industrial firms from China’s National Bureau of Statistics (NBS) over 1998-2007

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Basic data cleaning procedures

- Drop all firms with fewer than 10 employees
- Further quality checks
  - drop if total assets - total liabilities ≠ shareholder’s equity
  - drop if capital stock is missing
  - drop if capital-labor ratios > 99.9 or < 0.1 percentile
  - drop if wage bill is missing or negative, etc.
- Winsorized at 99% level to control outliers (value added, sales, investment, etc)
- Firm-year observations 2,225,748 in original sample and 1,995,759 in final sample
### Sample coverage vs. National aggregate data

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of firms</th>
<th>Share in manufacturing sector</th>
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<tbody>
<tr>
<td></td>
<td>Value added</td>
<td>Wage bill</td>
</tr>
<tr>
<td>1998</td>
<td>165,118</td>
<td>0.57</td>
</tr>
<tr>
<td>1999</td>
<td>162,033</td>
<td>0.60</td>
</tr>
<tr>
<td>2000</td>
<td>162,885</td>
<td>0.64</td>
</tr>
<tr>
<td>2001</td>
<td>171,256</td>
<td>0.64</td>
</tr>
<tr>
<td>2002</td>
<td>181,557</td>
<td>0.70</td>
</tr>
<tr>
<td>2003</td>
<td>196,222</td>
<td>0.77</td>
</tr>
<tr>
<td>2004</td>
<td>279,092</td>
<td>0.90</td>
</tr>
<tr>
<td>2005</td>
<td>271,835</td>
<td>0.82</td>
</tr>
<tr>
<td>2006</td>
<td>301,961</td>
<td>0.88</td>
</tr>
<tr>
<td>2007</td>
<td>336,768</td>
<td>0.93</td>
</tr>
</tbody>
</table>

Notes: Statistics are calculated by summing over all active firms in the NBS annual industrial firm surveys.
State-owned vs. Private Firms

1. Introduction
   - Related Literature

2. Institutional Background
   - Policy Experiment
   - Foreign Bank Activities Overview

3. Data and Methodology
   - Firm-level Data
   - **State-owned vs. Private Firms**
   - Financial Opening
   - Empirical Strategy

4. Empirical Analysis
   - Differential Effects across Firms
   - Bank Competition Channel
   - Robustness Checks

5. Conclusion
In empirical analysis, I focus on differential effects of foreign bank entry across state-owned vs. private firms

- SOE: less constrained
- Private firms: more constrained

Song et al. (2011) use loan-to-liability ratio to show private firms are more constrained and use more self-financing from retained earnings.

Here I provide additional suggesting evidence: use firm-level government subsidy and interest payment.
In empirical analysis, I focus on differential effects of foreign bank entry across state-owned vs. private firms

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Song et al. (2011) use loan-to-liability ratio to show private firms are more constrained and use more self-financing from retained earnings.

Here I provide additional suggesting evidence: use firm-level government subsidy and interest payment.
Subsidy and interest payment: SOE vs. POE

Table: SOEs get more subsidy and pay less interest

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>log(subsidy)</th>
<th>log(interest payment)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>SOE</td>
<td>0.283***</td>
<td>-0.439***</td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.031)</td>
</tr>
</tbody>
</table>

City-year FE | Yes | Yes
Industry-year FE | Yes | Yes
Profitability | Yes | Yes
Firm size (Liability size) | Yes | Yes

Observations | 1,116,740 | 462,173
R-square | 0.125 | 0.373

Notes: Clustered standard errors (at city level) in parentheses,

*** p<0.01, ** p<0.05, * p<0.1.
1 Introduction
   • Related Literature

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   • Empirical Strategy

4 Empirical Analysis
   • Differential Effects across Firms
   • Bank Competition Channel
   • Robustness Checks

5 Conclusion
How to measure foreign bank entry?

- Define a dummy $FBank_{c,t} = 1$ if foreign banks are allowed to enter city $c$ in year $t$
  - If foreign bank entered city $c$ at the end of 2003
    - $FBank_{c,2003} = 0$ and $FBank_{c,2004} = FBank_{c,2005} = 1$
  - I can also observe number of domestic/foreign bank branches by city (though no banking data by city-level)
  - Number of bank branches more likely to be endogenous

- Therefore, use the simple policy dummy to measure the overall effect of foreign bank entry
How to measure foreign bank entry?

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   • Bank Competition Channel
   • Robustness Checks

5 Conclusion
Main specifications

\[ Y_{i,c,j,t} = \alpha_i + \delta_c + \phi_{j,t} + \beta FBank_{c,t} + \gamma X_{i,c,j,t} + \varepsilon_{i,c,j,t} \]

- \( i, c, j, t \) = firm, city, industry, year
- \( Y_{i,c,j,t} \): firm-level outcome (credit access, investment, TFP)
- \( FBank_{c,t} \): dummy for foreign bank entry at city-year level
- \( \delta_c, \phi_{j,t} \): city FE, industry-year FE
- \( \alpha_i \): firm FE (unobserved time-invariant)
- \( X_{i,c,j,t} \): firm-level time-varying controls, e.g. lagged firm size, profitability

\[ Y_{i,c,j,t} = \alpha_i + \phi_{c,j,t} + \beta FBank_{c,t} \times FirmType_i + \gamma X_{i,c,j,t} + \lambda t \times FirmType_i + \varepsilon_{i,c,j,t} \]

- \( FirmType_i \): ex-ante heterogeneity among firms, (SOE vs. private, high ROA vs. low ROA); \( \phi_{c,j,t} \): City-industry-year FE
- \( t \times FirmType_i \): allow different linear trends across firm types
- Standard errors clustered at city level
Main specifications

\[ Y_{i,c,j,t} = \alpha_i + \delta_c + \phi_{j,t} + \beta FBank_{c,t} + \gamma X_{i,c,j,t} + \epsilon_{i,c,j,t} \]

- \(i, c, j, t\) = firm, city, industry, year
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- \(\phi_{c,j,t}\): City-industry-year FE
- \(t \times FirmType_i\): allow different linear trends across firm types
- Standard errors clustered at city level
<table>
<thead>
<tr>
<th>1</th>
<th>Introduction</th>
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<tr>
<td></td>
<td>Related Literature</td>
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</table>

<table>
<thead>
<tr>
<th>2</th>
<th>Institutional Background</th>
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<tr>
<td></td>
<td>Policy Experiment</td>
</tr>
<tr>
<td></td>
<td>Foreign Bank Activities Overview</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Data and Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Firm-level Data</td>
</tr>
<tr>
<td></td>
<td>State-owned vs. Private Firms</td>
</tr>
<tr>
<td></td>
<td>Financial Opening</td>
</tr>
<tr>
<td></td>
<td>Empirical Strategy</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>4</th>
<th>Empirical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Differential Effects across Firms</td>
</tr>
<tr>
<td></td>
<td>Bank Competition Channel</td>
</tr>
<tr>
<td></td>
<td>Robustness Checks</td>
</tr>
</tbody>
</table>

| 5 | Conclusion |
Differential Effects across Firms

Part 1: SOE vs. Private firms (Main results)

- Define $Private = 1$ for private-owned, $Private = 0$ for SOE, as proxy for financial constraints

$$Y_{i,c,j,t} = \beta_1 Private_i \times FBank_{c,t} + \gamma X_{i,c,j,t} + \phi_{c,j,t} + \alpha_i + \lambda t \times Private_i + \varepsilon_{i,c,j,t}$$

- Estimate $\beta_1$ (diff-in-diff)
- $X_{i,c,j,t}$ controls lagged firm size and profitability

- Dependent variables: credit access and real performance
- Bank loans, long-term debt, sales and investment
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$$Y_{i,c,j,t} = \beta_1 Private_i \times FBank_{c,t} + \gamma X_{i,c,j,t}$$

$$+ \phi_{c,j,t} + \alpha_i + \lambda t \times Private_i + \epsilon_{i,c,j,t}$$

- Estimate $\beta_1$ (diff-in-diff)
- $X_{i,c,j,t}$ controls lagged firm size and profitability
- Dependent variables: credit access and real performance
- Bank loans, long-term debt, sales and investment
Credit access: SOE vs. Private firms

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>log(loans)</th>
<th>log(LT debt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cities</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Foreign bank × Private</em></td>
<td>0.049**</td>
<td>0.134</td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
<td>(0.082)</td>
</tr>
<tr>
<td>Profitability</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm size</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>City-industry-year FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Private-year Trend</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Clustered at</td>
<td>city</td>
<td>city</td>
</tr>
<tr>
<td>Observations</td>
<td>1,022,776</td>
<td>1,022,776</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.717</td>
<td>0.719</td>
</tr>
</tbody>
</table>
Differential Effects across Firms

Real activities: SOE vs. Private firms

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>log(sales)</th>
<th>log(investment)</th>
<th>log(TFP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cities</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Foreign bank × Private</td>
<td>0.038***</td>
<td>0.043***</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.015)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>Profitability</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm size</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>City-industry-year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Private-year Trend</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Clustered at</td>
<td>city</td>
<td>city</td>
<td>city</td>
</tr>
<tr>
<td>Observations</td>
<td>1,022,776</td>
<td>862,613</td>
<td>1,022,776</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.924</td>
<td>0.669</td>
<td>0.729</td>
</tr>
</tbody>
</table>
Control for trade openness

- Should previous results be attributed to time varying regional trade shocks?
  - city-level trade openness positively correlated with financial opening (correlation ratio=0.34)

- Construct city-level trade openness index $\text{TradeOpen}_{c,t}$:
  - Total exports value divided by total number of workers (Autor, Dorn and Hanson, 2013)

- Test whether previous results still hold after controlling for city-level trade exposure
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- Test whether previous results still hold after controlling for city-level trade exposure
### Result: control for trade openness

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>log(loans)</th>
<th>log(investment)</th>
<th>log(TFP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All cities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Foreign bank × Private</strong></td>
<td>0.075**</td>
<td>0.108**</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>(0.034)</td>
<td>(0.042)</td>
<td>(0.028)</td>
</tr>
<tr>
<td><strong>TradeOpen × Private</strong></td>
<td>-0.011*</td>
<td>0.005</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.014)</td>
<td>(0.005)</td>
</tr>
<tr>
<td><strong>Firm size\textsubscript{t−1}</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Profitability\textsubscript{t−1}</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Firm FE</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>City-industry-year FE</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Clustered at city</strong></td>
<td>city</td>
<td>city</td>
<td>city</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
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<td>862,613</td>
<td>1,022,776</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.736</td>
<td>0.546</td>
<td>0.665</td>
</tr>
</tbody>
</table>
How to measure bank competition?

- Foreign bank entry increased competition in the domestic banking sector, which in turn improve private firms’ credit access

- Data: province-level banking competition index ($\text{CompIndex}$)
  - definition: share of loans by non-state banks, larger index means a higher level of competition

- First stage: regress $\text{CompIndex}$ on foreign bank entry policy
- Second stage: regress firms’ outcome on estimated value of $\text{CompIndex}$
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  - definition: share of loans by non-state banks, larger index means a higher level of competition

- First stage: regress ComplIndex on foreign bank entry policy
- Second stage: regress firms’ outcome on estimated value of ComplIndex
Foreign bank entry increased competition in the domestic banking sector, which in turn improve private firms’ credit access.

Data: province-level banking competition index (CompIndex)

- definition: share of loans by non-state banks, larger index means a higher level of competition

First stage: regress CompIndex on foreign bank entry policy
Second stage: regress firms’ outcome on estimated value of CompIndex
First stage: foreign bank entry intensified bank competition

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Bank competition index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Province-year panel</td>
<td>(1)</td>
</tr>
<tr>
<td>Foreign bank</td>
<td>0.509*</td>
</tr>
<tr>
<td></td>
<td>(0.271)</td>
</tr>
<tr>
<td>log(GDP)</td>
<td>4.792**</td>
</tr>
<tr>
<td></td>
<td>(2.168)</td>
</tr>
<tr>
<td>log(Population)</td>
<td>-0.269</td>
</tr>
<tr>
<td></td>
<td>(2.921)</td>
</tr>
<tr>
<td>Year dummy</td>
<td>Yes</td>
</tr>
<tr>
<td>Province dummy</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>310</td>
</tr>
<tr>
<td>Number of provinces</td>
<td>31</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.570</td>
</tr>
</tbody>
</table>

Note: * indicates significance at the 10% level, ** indicates significance at the 5% level.
Second stage: use predicted competition index

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>log(loans)</th>
<th>log(investment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>opened cities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$CompIndex \times Private$</td>
<td>0.249***</td>
<td>0.201**</td>
</tr>
<tr>
<td></td>
<td>(0.085)</td>
<td>(0.088)</td>
</tr>
<tr>
<td>$CompIndex \times Foreign$</td>
<td>0.171</td>
<td>0.032</td>
</tr>
<tr>
<td></td>
<td>(0.100)</td>
<td>(0.139)</td>
</tr>
</tbody>
</table>

$Firm size_{t-1}$: Yes, Yes

$Profitability_{t-1}$: Yes, Yes

Firm FE: Yes, Yes

City-industry-year FE: Yes, Yes

Ownership-year Trend: Yes, Yes

Clustered at city: city, city

Observations: 342,368, 222,780

R-squared: 0.729, 0.553
Introduction

Related Literature

Institutional Background

Policy Experiment
Foreign Bank Activities Overview

Data and Methodology

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Robustness Checks

Conclusion
Threats to identification

- Selection at treatment
  - firms do not switch ownership type

- Possible policy bundles
  - e.g. tariffs decline following WTO accession, uniform across cities
  - less likely to be perfectly correlated with foreign bank entry dummy *across city and time*

- Pre-existing trends
  - control for differential trends across firm types
  - when trend controls are dropped, no visible difference in prior trends in investment/sales
Threats to identification

- Selection at treatment
  - firms do not switch ownership type

- Possible policy bundles
  - e.g. tariffs decline following WTO accession, uniform across cities
  - less likely to be perfectly correlated with foreign bank entry dummy across city and time

- Pre-existing trends
  - control for differential trends across firm types
  - when trend controls are dropped, no visible difference in prior trends in investment/sales
Robustness Checks

Alternative samples

(1) Use sub-sample of 20 “opened cities” only
   - early access vs. later access to foreign banks
Use sub-sample of 20 “opened cities” only

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>$\log(\text{loans})$</th>
<th>$\log(\text{sales})$</th>
<th>$\log(\text{investment})$</th>
<th>$\log(\text{TFP})$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample: opened cities</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>$\text{Foreign bank} \times \text{Private}$</td>
<td>0.046**</td>
<td>0.057***</td>
<td>0.122***</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.006)</td>
<td>(0.021)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Profitability</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm size</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>City-industry-year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Private-year Trend</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>210,270</td>
<td>223,511</td>
<td>242,701</td>
<td>219,231</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.726</td>
<td>0.923</td>
<td>0.669</td>
<td>0.676</td>
</tr>
</tbody>
</table>

Notes: Clustered standard errors (at city level) in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Alternative samples

- (1) Use sub-sample of 20 “opened cities” only
  - early access vs. later access to foreign banks
- (2) Use *propensity score matching* to identify a control group of cities which were comparable with “opened cities” before the deregulation
  - exclude the “big 5”: Beijing, Shanghai, Guangzhou, Shenzhen, Tianjin
  - find 15 control cities matched to 15 opened cities
Robustness Checks

Additional robustness checks

- Robustness checks:
  - use propensity score matching at firm-level to identify comparable firms
  - placebo: assign fake foreign bank entry to a random selection of cities

- Main results still hold
Summary

- This paper studies the real effects of foreign bank entry on firms’ credit access and performance.
  - using both timing and geographic variation in policy of foreign bank lending in China

- Additional credit brought by foreign banks had a larger impact on private firms (previously more constrained) than on SOEs.

- Implication: banking sector liberalization policy on foreign bank lending helps alleviate financial constraints of some firms, especially those private firms without political connections.
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