The SOE Premium and Government Support in China’s Credit Market

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Joint work with Zhe Geng from SAIF
Motivation

- Credit misallocation with respect to state-owned enterprises (SOE):
  - Allocational inefficiency drags on aggregate growth (Hsieh and Klenow (2009)).
- Existing empirical evidences on credit allocation in China:
  - Widely cited: SOEs’ preferential access to bank loans.
  - Not well documented: the actual magnitudes.
  - Interconnected debt financing channels: bank loans, bonds, shadow banking.
  - Changing government policies and credit conditions.
- Our paper uses bond pricing to uncover the extent of credit misallocation in China:
  - The SOE premium: difference in credit spreads between non-SOEs and SOEs.
  - Increased importance of the extent of government support in credit pricing.
  - Distortions to (i) price discovery and (ii) credit allocation.
  - The real impact of allocational inefficiency: profitability and financial health.
Background on China’s Credit Market

- $0.1 trillion in 2008, $4.5 trillion in 2020, second only to the US ($7.3 trillion).
- Two landmark events: March 4, 2014 and Apr 27, 2018.
The Time-Varying SOE Premium

CreditSpread_{i,t} = a + b \, \text{NSOE}_{i,t} + c \, \text{Rating}_{i,t} + \sum_k \text{Controls}_{k,t}^i + \epsilon_{i,t}

First Default   New Regulation

10Q1 11Q1 12Q1 13Q1 14Q1 15Q1 16Q1 17Q1 18Q1 19Q1 20Q1

-50 0 50 100 150 200

Difference in Credit Spread (bps)

Difference in Credit Spread (left axis)
The SOE Premium and Credit Cycles

CreditSpread\(_{i,t} = a + b \text{NSOE}_{i,t} + c \text{Rating}_{i,t} + \sum_{k} \text{Controls}_{i,t}^{k} + \epsilon_{i,t}\)

NBER Summer Institute

SOE Premium and Government Support

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Behind the Explosive SOE Premium

- Government-led credit tightening:
  - Culminated with the release of “New Regulation on Asset Management.”
  - Shrunk the financing and re-financing channels of corporate issuers.
- Since November 1, 2018, efforts from the government to reassure the private sector.

- Competing explanations for the explosive SOE premium:
  - **Government support**: Lacking government support, non-SOEs are perceived by investors as more vulnerable than their SOE counterparts.
  - **Credit quality**: Due to over-borrowing and over-expanding, non-SOEs are weak in fundamental strength and ill prepared for the credit contraction.
Our Contributions to the Literature

- The macro literature on credit misallocations and their impact on China’s growth:
  - **Our paper:** Use credit market to uncover the opaque credit allocation, and document the severe segmentation in pricing post 2018Q2 and its real impact.

- The asset-pricing literature studying the information content of credit spreads:
  - Evidence from the US: Collin-Dufresne, Goldstein and Martin (2001), Campbell and Taksler (2003), Bao (2009), Bao, Pan, and Wang (2011), and others.
  - **Our paper:** The information content of credit spreads in China.

- Government support and credit spreads:
  - Berndt, Duffie, and Zhu (2019): Bailout probability and banks’ credit spreads.
  - **Our paper:** Government support and credit spreads in China.
Growing Literature on China’s Credit Market

- Government guarantee in
- Other topics:
  - Mo and Subrahmanyam (2019) on liquidity.
  - Chen, He, and Liu (2020) on the growth of Chengtou bonds.
  - Ding, Xiong, and Zhang (2020) on issuance overpricing.
  - Gao, Huang, and Mo (2020) on credit enhancement.
Key Measures: Credit Quality and Government Support

- **Default Measure (DM)**: inverse of Merton’s distance to default (DD).
  - Measured quarterly, using firms' equity and balance-sheet information:
    \[
    DM_t = DD_t^{-1} \quad \text{and} \quad DD = \left( \mu - \frac{1}{2} \sigma_A^2 \right) T - \ln \left( \frac{K}{V_0} \right) \frac{\sigma_A}{\sqrt{T}}
    \]
  - Issuers with higher DM: lower credit quality and more likely to default.

- **The Non-SOE Dummy (NSOE)**: divides firms into two solid blocks.
  - Defined by the affiliation, state or non-state, of the end-controller of the firm.
  - Government: central or local SASAC, government institutions, and SOEs.

- **Government Holdings (GovtHoldings)**: a continuous measure.
  - Government’s equity ownership of a firm, measured at quarterly frequency.
  - Built from the ground up and has not been studied for credit pricing.
  - Informative both across and within the samples of SOEs and non-SOEs.
Default Measures

**Default Measure: NSOE – SOE**

\[ \text{DM}_{i,t} = a + b \text{NSOE}_{i,t} + c \text{Rating}_{i,t} + \sum_k \text{Controls}_{k_{i,t}} + \epsilon_{i,t} \]

<table>
<thead>
<tr>
<th></th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSOE</strong></td>
<td>-1.50***</td>
<td>-3.08***</td>
<td>-0.55</td>
</tr>
<tr>
<td></td>
<td>[-2.95]</td>
<td>[-4.23]</td>
<td>[-0.91]</td>
</tr>
<tr>
<td><strong>Rating</strong></td>
<td>0.79*</td>
<td>-0.18</td>
<td>1.60***</td>
</tr>
<tr>
<td></td>
<td>[1.94]</td>
<td>[-0.51]</td>
<td>[3.13]</td>
</tr>
<tr>
<td><strong>Obs</strong></td>
<td>4,344</td>
<td>10,072</td>
<td>5,350</td>
</tr>
<tr>
<td><strong>Adj R^2</strong></td>
<td>0.151</td>
<td>0.660</td>
<td>0.331</td>
</tr>
</tbody>
</table>

SOE Premium and Government Support

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Explaining the SOE Premium: Credit Quality vs Government Support

CreditSpread\(_{i,t}\) = \(a + b \text{NSOE}_{i,t} + c \text{DM}_{i,t} + d \text{GovtHoldings}_{i,t} + e \text{Rating}_{i,t} + \sum_k \text{Controls}_k\) + \(\epsilon_{i,t}\)

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<tr>
<td><strong>NSOE</strong></td>
<td>0.20*** (3.08)</td>
<td>0.20*** (3.58)</td>
<td>1.06*** (7.78)</td>
</tr>
<tr>
<td><strong>DM</strong></td>
<td>-0.13 (-0.40)</td>
<td>1.26*** (4.52)</td>
<td>4.78*** (5.24)</td>
</tr>
<tr>
<td><strong>GovtHoldings</strong></td>
<td>0.00 (0.01)</td>
<td>-0.08 (-0.37)</td>
<td>-2.81*** (-7.82)</td>
</tr>
<tr>
<td><strong>Rating</strong></td>
<td>0.51*** (6.39)</td>
<td>0.53*** (10.96)</td>
<td>1.24*** (4.84)</td>
</tr>
<tr>
<td><strong>Obs</strong></td>
<td>4,344</td>
<td>10,072</td>
<td>5,348</td>
</tr>
<tr>
<td><strong>Adjusted R(^2)</strong></td>
<td>0.543</td>
<td>0.468</td>
<td>0.385</td>
</tr>
</tbody>
</table>
The Content of Price Discovery Diverges

**Default Measure, Incremental R2**

**Government Holdings, Incremental R2**
The Real Impact

Return on Assets

\[ \text{ROA}_{i,t} = a + b \text{NSOE}_{i,t} + c \text{EquitySize}_{i,t} + \epsilon_{i,t} \]

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<tr>
<td><strong>NSOE</strong></td>
<td>0.56***</td>
<td>0.52***</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>[7.76]</td>
<td>[8.83]</td>
<td>[1.07]</td>
</tr>
<tr>
<td><strong>EquitySize</strong></td>
<td>0.18***</td>
<td>0.19***</td>
<td>0.35***</td>
</tr>
<tr>
<td></td>
<td>[6.00]</td>
<td>[6.33]</td>
<td>[8.69]</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>-3.54***</td>
<td>-4.33***</td>
<td>-7.40***</td>
</tr>
<tr>
<td><strong>Obs</strong></td>
<td>15,724</td>
<td>18,533</td>
<td>10,868</td>
</tr>
<tr>
<td><strong>Adj R^2</strong></td>
<td>0.065</td>
<td>0.063</td>
<td>0.095</td>
</tr>
</tbody>
</table>
The Real Impact

Sorting by DM: "Good"

- Avg=1.7%
- Avg=0.78%
- Avg=1.2%
- Avg=0.82%

10Q1 11Q1 12Q1 13Q1 14Q1 15Q1 16Q1 17Q1 18Q1 19Q1

Quarterly ROA (%)

Quarterly Default Amount (Billion RMB)

Trade-War-Less-Affected Industries

- Avg=1.33%
- Avg=0.66%
- Avg=0.80%
- Avg=0.69%

Quarterly ROA (%)

Quarterly Default Amount (Billion RMB)

Trade-War-Affected Industries

- Avg=1.26%
- Avg=0.59%
- Avg=0.82%
- Avg=0.61%

Quarterly ROA (%)

Quarterly Default Amount (Billion RMB)

Sorting by DM: "Bad"

- Avg=0.89%
- Avg=0.44%
- Avg=0.44%
- Avg=0.48%

Quarterly ROA (%)

Quarterly Default Amount (Billion RMB)

Trade-War-Less-Affected Industries

- Avg=1.26%
- Avg=0.59%
- Avg=0.82%
- Avg=0.61%

Quarterly ROA (%)

Quarterly Default Amount (Billion RMB)

Trade-War-Affected Industries

- Avg=1.33%
- Avg=0.66%
- Avg=0.80%
- Avg=0.69%

Quarterly ROA (%)

Quarterly Default Amount (Billion RMB)
Conclusions and Remaining Questions

- From 2010-2020, we find a market of evolving and improving price discovery:
  - Post 2014Q1, credit quality becomes important in credit pricing.
  - Post 2018Q2, the extent of government support becomes more important.
    - The main driver behind the explosive SOE premium.
    - The beginning of the end: “faith” in the SOE label.
    - Distortions to price discovery with respect to credit quality.

- The real impact of the allocational inefficiency.
  - Post 2018Q2, non-SOEs lost their advantage over SOEs in profitability.
  - The explosive SOE premium is a reflection, not the unique cause.

- Remaining questions:
  - What is the exact nature of government support?
  - Call for a “unified” approach: extend the default measure to incorporate collateral and/or (implicit) state guarantee.
  - Decompose the SOE premium: credit risk and risk premium.