Trade and finance: is there more than just “trade finance”? Evidence from matched bank-firm data

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Introduction

- Do credit shocks matter for trade (esp. for the trade collapse after Lehman Brothers)?
- What is in particular the role of trade finance (loans for international trade activities)?
- Banks supply the following services:
  - Facilitate cross-border payments (letters of credit)
  - Provide short-term loans to finance firms’ export working capital or imports of intermediate inputs
  - Provide long-term loans for investments that expand firms’ production capacity for exports
- Lack of good measures of trade finance in the existing literature
Related literature

- **Exports and credit shocks**
  - Bank-firm data: credit shocks account for 20-35 percent of the decline in exports in Japan (Amiti and Weinstein 2011), 15 percent in Peru (Paravisini et al. 2011)

- **International trade finance practices**

- **Real effects of finance**
  - Bernanke 1983, Peek and Rosengren 2000, Kashyap and Stein 2000
Our contribution

- First study in which loans for export or import transactions are observed in matched bank-firm data
  - Large sample of Italian manufacturing exporters, 2007-2010
- Exploiting the unexpected funding shock on interbank markets after Lehman, we investigate:
  - the effect on trade finance supply vs. ordinary loans
  - the role of trade finance in the trade collapse
Data

- **Bank-firm data:** quarterly stocks of outstanding loans
  - Central Credit Register (all lines of credit and guarantees above EUR 75,000 threshold)
- **Crucially, loans are disaggregated according to the activity**
  - Export loans and guarantees
  - Import loans and guarantees
  - Ordinary loans (ST and LT) and guarantees
- **Firm-level datasets:** annual data on exports (2007-2010)
  - Company Accounts Data Service
  - Bank of Italy’s Survey of Industrial and Service Firms
  - Unfortunately no information on destination markets of exports
- **Additional bank-level datasets**
  - Bank of Italy’s Census of Banks, Supervisory Reports, Orbis
Sample of Italian manufacturing exporters

- Unbalanced panel of about 7,800 firms
- About 105,000 bank-firm observations
- 40% of sales by Italy's manufacturing sector
- 48% of exports on Italy's total exports of goods
- Exports show a similar pattern to official statistics during the trade collapse (-21% in 2009)
Stylized facts on trade finance

- Not all banks are active on trade finance
- Trade finance is more concentrated (especially for guarantees)
  - Top 10 banks account for more than 70% for loans and 90% for guarantees
  - The role of the main bank is more relevant (60% for export loans versus 45% for total loans)
- Multiple credit relationships are however frequent also for trade finance
  - The median firm borrows from 3 banks for trade finance versus 5 banks for total loans
Econometric strategy

- **Part 1**: Effect of credit shock on supply of trade finance (bank-firm data)
- **Part 2**: Effect of credit shock on exports (firm data)

We exploit Italian banks’ deposit liabilities vis-à-vis non-residents as a source of identification for the credit shock.

The shock on foreign funding was:
- Large and sudden (2008Q4 and 2009)
- Heterogeneous across banks (large banks were much more exposed than small-medium banks)
- Correlated with credit supply
- Exogenous to firms’ export behavior (tensions in international interbank market)
Estimation strategy (bank-firm data)

- How did the negative funding shock impact on supply of trade finance?

$$\Delta \ln L_{ibt}^{loantype} = \beta \text{exposure}_{bt-1} + \sum_{it} \alpha_{it} \text{firm}_{it} + Z_{bt} + \epsilon_{ibt}$$

\(\forall \text{loantype} = \{\text{export}, \text{import}, \text{ordinary}_{ST}, \text{ordinary}_{LT}\}\)

- Change in log loans from bank \(b\) to firm \(i\) as a function of bank's exposure to foreign funding shock
- Separate estimates for each of the four loan types
- Firm-year FE (control for credit demand shocks), only firms with multiple banks (Khwaja and Mian 2008)
- Bank-level controls (main bank, assets, subsidiaries and branches abroad, foreign ownership)
## Effect of funding shock on credit supply by loan type

### Table: Credit supply shocks by loan type: baseline estimates

<table>
<thead>
<tr>
<th></th>
<th>Total loans</th>
<th>Ordinary LT loans</th>
<th>Ordinary ST loans</th>
<th>Export loans</th>
<th>Import loans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
<td><strong>exposure_{bt-1}</strong></td>
<td>-0.252***</td>
<td>-0.230***</td>
<td>-0.350***</td>
<td>-0.131</td>
<td>-0.141</td>
</tr>
<tr>
<td></td>
<td>(0.054)</td>
<td>(0.064)</td>
<td>(0.096)</td>
<td>(0.096)</td>
<td>(0.117)</td>
</tr>
<tr>
<td><strong>assets_{bt-1}</strong></td>
<td>-0.006**</td>
<td>-0.022***</td>
<td>0.008*</td>
<td>-0.005</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.006)</td>
<td>(0.006)</td>
</tr>
<tr>
<td><strong>foreign_{bt}</strong></td>
<td>0.099***</td>
<td>0.110***</td>
<td>0.107***</td>
<td>0.047*</td>
<td>-0.018</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.024)</td>
<td>(0.027)</td>
<td>(0.025)</td>
<td>(0.033)</td>
</tr>
<tr>
<td><strong>abroad_{bt}</strong></td>
<td>0.034***</td>
<td>0.046***</td>
<td>0.011</td>
<td>0.017</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.021)</td>
<td>(0.024)</td>
</tr>
<tr>
<td><strong>mainbank_{ibt}</strong></td>
<td>0.132***</td>
<td>0.180***</td>
<td>0.072***</td>
<td>0.062***</td>
<td>0.038*</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.009)</td>
<td>(0.016)</td>
<td>(0.014)</td>
<td>(0.020)</td>
</tr>
</tbody>
</table>

Firm-year FE: yes  
Observations: 41961, 25488, 32806, 14332, 6339  
No. firms: 4800, 4415, 4430, 2854, 1123  
Clusters: 414, 371, 375, 234, 187  
$R^2$: 0.285, 0.357, 0.342, 0.432, 0.432
Estimation strategy (firm data)

\[ \Delta \ln Y_{it} = \beta \sum_b \omega_{ibt-1} \text{exposure}_{bt-1} + \theta Z_{it} + \epsilon_{it} \]

- Reduced form estimation of exports on firms’ exposure (weighted average of banks’ exposure to foreign funding)
- \( \text{exposure}_{bt-1} \): bank \( b \)'s share of deposits held by non-residents
- \( \omega_{ibt-1} \): share of bank \( b \)'s loans on total loans borrowed from firm \( i \)
- Controls: 2-digit sector*year FE, main bank FE, size, leverage, distressed
- Sample estimation period: 2009-2010 (annual data)
## Exports and credit shocks

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δln(export)_{it}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exposure_{it - 1}</td>
<td>-0.116***</td>
<td>-0.091**</td>
<td>-0.105**</td>
<td>-0.091*</td>
<td>-0.087*</td>
</tr>
<tr>
<td></td>
<td>(0.044)</td>
<td>(0.045)</td>
<td>(0.048)</td>
<td>(0.050)</td>
<td>(0.049)</td>
</tr>
<tr>
<td>assets_{it - 1}</td>
<td>-0.010***</td>
<td>-0.011***</td>
<td>-0.008**</td>
<td>-0.014***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.004)</td>
<td></td>
</tr>
<tr>
<td>leverage_{it - 1}</td>
<td></td>
<td></td>
<td>0.064**</td>
<td>0.063**</td>
<td>0.096***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.025)</td>
<td>(0.025)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>distressed_{it - 1}</td>
<td></td>
<td></td>
<td></td>
<td>-0.003</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.025)</td>
<td></td>
</tr>
<tr>
<td>exposure_{it - 1} × distressed_{it - 1}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.249*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.146)</td>
</tr>
<tr>
<td>Industry-year FE</td>
<td>2d</td>
<td>2d</td>
<td>2d</td>
<td>3d</td>
<td>2d</td>
</tr>
<tr>
<td>Main bank FE</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Observations</td>
<td>8034</td>
<td>7664</td>
<td>7422</td>
<td>7422</td>
<td>7415</td>
</tr>
<tr>
<td>Clusters</td>
<td>4829</td>
<td>4626</td>
<td>4502</td>
<td>4502</td>
<td>4497</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.231</td>
<td>0.239</td>
<td>0.243</td>
<td>0.277</td>
<td>0.245</td>
</tr>
</tbody>
</table>

**Table:** Exports and credit shocks
Concluding remarks

- What was the role of ‘trade finance’ in the trade collapse?
  - Trade finance was not more responsive to the post-Lehman funding shock compared with other forms of bank finance
  - The fall in the overall credit supply did have anyway a significant negative effect on firms’ exports

- There is more than just ‘trade finance’
  - The effect of credit shocks on exports is not only limited to the specific financing of export transactions...
  - ... but reflects more general credit constraints for the exporting firm (e.g. loans for investments, working capital, etc.)
Thank you for your attention
A simplified diagram of trade and finance

INPUTS
- **Imported goods**
- **Cash term import loans** to acquire inputs abroad
- **Long term domestic loans** for investments

OUTPUTS
- **Exported goods**
- **Cash export loans** advance on export sales
- **Credit import guarantees**
- **Credit export guarantees**

Asymmetric information

**BANK**
Foreign funding and credit to non-financial firms

Banks’ loans to non-financial firms and foreign deposits
Stylized facts on trade finance

Table: **Summary statistics on trade finance**

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Ordinary short-term</th>
<th>Ordinary long-term</th>
<th>Export</th>
<th>Import</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Loans</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. banks with loans &gt; 0</td>
<td>383</td>
<td>353</td>
<td>339</td>
<td>231</td>
<td>180</td>
</tr>
<tr>
<td>% share of top ten banks</td>
<td>65.9</td>
<td>62.7</td>
<td>68.4</td>
<td>77.8</td>
<td>73.6</td>
</tr>
<tr>
<td>% loans on total loans</td>
<td>100.0</td>
<td>22.8</td>
<td>60.8</td>
<td>11.6</td>
<td>4.9</td>
</tr>
<tr>
<td>No. banks with loans &gt; 0 per firm (median)</td>
<td>5.0</td>
<td>4.0</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>% loans from main bank (median)</td>
<td>45.0</td>
<td>49.1</td>
<td>61.3</td>
<td>60.0</td>
<td>58.2</td>
</tr>
<tr>
<td>** Guarantees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. banks with guarantees &gt; 0</td>
<td>237</td>
<td>233</td>
<td>-</td>
<td>16</td>
<td>66</td>
</tr>
<tr>
<td>% share of top ten banks</td>
<td>77.8</td>
<td>73.5</td>
<td>-</td>
<td>99.9</td>
<td>96.5</td>
</tr>
<tr>
<td>% guarantees on total guarantees</td>
<td>100.0</td>
<td>70.8</td>
<td>-</td>
<td>8.5</td>
<td>20.7</td>
</tr>
<tr>
<td>No. banks with guarantees &gt; 0 per firm (median)</td>
<td>1.0</td>
<td>1.0</td>
<td>-</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>% guarantees from main bank (median)</td>
<td>100.0</td>
<td>100.0</td>
<td>-</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>