When Losses Turn Into Loans: The Cost of Weak Banks

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Motivation

- Financial crises leave behind weak banks.
- Japan in 90s: Weak banks lending to ‘zombie’ firms contributed to lost decade?
- Europe today: Parallels to Japan.

Do weak banks contribute to slow recoveries?

This Paper: Yes, based on evidence from Europe after sovereign debt crisis.
This Paper: Main Results

**Natural experiment** = European Banking Authority increases capital requirements.

1. **Banks underreport loan losses.**
   - Develop algorithm to detect underreporting at firm-bank level.

2. **Banks cut lending** but also **reallocate credit to distressed, underreported firms.**
   - Diff-in-diff at firm-bank level.

3. **Negative effect on aggregate productivity growth.**
   - Partial equilibrium decomposition of aggregate TFP: Input reallocation due to credit reallocation can explain about 13% of observed productivity decline in 2012.
Data


- Universe of **loans** (> 50 EUR) at monthly frequency

- Quarterly **bank** financial information
  - Sample of 48 banks (over 90% of lending in Portugal).

- Annual **firm** financial data on universe of firms
  - Sample of 126,595 firms matched to the loan data (81% of sales and 72% of assets).
Identification Challenge

- Existing literature\(^1\)
  
  \[
  \text{credit growth}_{fbt} = \beta_1 (\text{undercap bank}_{bt} \times \text{poorly perf firm}_{ft}) + \text{controls} + \epsilon_{fbt}
  \]

- Interpret \(\beta_1 > 0\) = evidence for distorted lending.

- **Challenge 1**: Undercap bank may also be **bad bank**.

- **Challenge 2**: Undercap bank doesn’t lend to **all** poorly performing firms.

- **Challenge 3**: Poorly performing firms only in **temporary** distress.

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\(^1\)Peek and Rosengren 2005; Acharya et al. 2017; Schivardi et al. 2017
European Banking Authority (EBA) raised capital ratios for some banks.

“The objective [...] is to create an exceptional and temporary capital buffer to address current market concerns over sovereign risk.”
Definition of Exposed Banks

- **Large banks:** \( \frac{\text{Core Tier 1—sovereign debt buffer}}{\text{RWA}} \geq 0.09. \)
- **Buffer:** Reflect decline in value of EEA sovereign debt.
- **Exposed:** Subject to EBA and sovereign buffer \( > \text{median}. \)
- **Non-exposed:**
  - Subject to EBA but sovereign buffer \( < \text{median}. \)
  - Not subject to EBA.
Solution to Challenge 2: Underreporting of Loan Losses

- Measure underreporting based on **discrepancies in monthly loan data**.
- **Mechanism**: Continue lending to avoid recognizing past (underreported) losses.
Identification Strategy

- **Diff-in-diff**

\[
\text{credit growth}_{fbt} = \beta_1 (\text{EBA bank}_b \times \text{underreported}_b \times \text{period}_\tau) + \text{interactions} + \theta_{ft} + \varphi_b + \epsilon_{fbt}
\]

- Interpret \( \beta_1 > 0 \) = evidence for distorted lending.

- **Solution 1**: EBA induces plausibly exogenous variation in capital adequacy.

- **Solution 2**: Underreporting picks out distressed firms subject to distorted lending.

- **Solution 3**: Firm×time FE control for firm-level credit demand.
Exposed banks cut credit but **shift loans to distressed, underreported firms** for duration of shock.

\[
\text{credit growth}_{fbt} = \beta_1 (\text{EBA bank}_b \times \text{underreported}_f \times \text{period}_\tau) \\
+ \beta_2 (\text{EBA bank}_b \times \text{period}_\tau) + \text{interactions} + \theta_{ft} + \varphi_b + \epsilon_{fbt}
\]
Detecting Loss Underreporting
Observe monthly data for each loan but collapse to the firm-bank level.
Consider Barclays lending to Sagres Inc.

<table>
<thead>
<tr>
<th>EUR m</th>
<th>&lt;30 days</th>
<th>Overdue 1 month</th>
<th>2 months</th>
<th>Performing credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>5</td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>February</td>
<td>5</td>
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<td></td>
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<tr>
<td>March</td>
<td>5</td>
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<td></td>
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Data: Firm-bank Loan Panel

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</tr>
<tr>
<td>March</td>
<td>5 → 10</td>
<td>← 5</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>April</td>
<td>6</td>
<td></td>
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Description of Algorithm

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- Define excess mass as deviation from identity
  \[ E(t; b) = B(t; k) - B(t - 1; k - 1) \]

- **Challenge 1**: Buckets \( k \) are coarse.
  - Auxiliary step: Cumulative excess mass
    \[ \implies \text{recursively back out excess mass.} \]

- **Challenge 2**: Flows.
  - Measure in data + extensive robustness.
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Exposed banks *underreport losses to boost capital*. Additional 4-20% capital during EBA.
Effects on Productivity
Effects on Productivity

Did the EBA-induced credit reallocation reduce aggregate productivity growth?

Results

1. Underreported firms (that obtain more credit) have lower capital and labor wedges pre-shock than other firms (that obtain less credit).

2. Credit reallocation passed through to firm-level input use and wedges.

Aggregate TFP Decomposition

- Aggregate TFP = technical efficiency and **allocative efficiency** (between and within sectors)

\[
\Delta \ln TFP \simeq \Delta TE + \Delta AE_{\text{within}} + \Delta AE_{\text{between}}. 
\]

- Allocative efficiency is a function of **firm-level capital and labor wedges**.

\[
\Delta AE_{\text{within},s} = \frac{\alpha_s}{1 - \gamma_s \theta_s} \sum_i \left[ (1 - \beta_s \theta_s) s_{i,t-1}^K + \beta_s \theta_s s_{i,t-1}^L - y_{i,t-1} \right] \frac{\Delta \tau_{it}^K}{1 + \tau_{i,t-1}^K} \\
+ \frac{\beta_s}{1 - \gamma_s \theta_s} \sum_i \left[ \alpha_s \theta_s s_{i,t-1}^K + (1 - \alpha_s \theta_s) s_{i,t-1}^L - y_{i,t-1} \right] \frac{\Delta \tau_{it}^L}{1 + \tau_{i,t-1}^L}. 
\]
Effect of EBA Intervention on Allocative Efficiency

Decomposition suggests negative effects of both overall EBA and EBA-induced credit reallocation.

<table>
<thead>
<tr>
<th></th>
<th>Δ Allocative efficiency</th>
<th>Capital</th>
<th>Labor</th>
</tr>
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<tbody>
<tr>
<td>EBA overall (%)</td>
<td>-5.78</td>
<td>-4.03</td>
<td>-1.74</td>
</tr>
<tr>
<td>Reallocation only (%)</td>
<td>-1.38</td>
<td>-0.78</td>
<td>-0.60</td>
</tr>
<tr>
<td>Portugal in 2012 (%)</td>
<td>-12.45</td>
<td>-5.41</td>
<td>-7.04</td>
</tr>
</tbody>
</table>
Conclusion

- Novel evidence that weak banks have contributed to slow recovery after the European sovereign debt crisis.

**Policy implications**

- Reported capital adequacy inflated due to underreporting of losses.
- Raising capital ratios can have unintended consequences.
- Importance of well-capitalized financial system.