Borrower and Lender Resilience
Anil Kashyap and Guido Lorenzoni

• Motivation

• Baseline model

• Optimal policy

Any views expressed are our own and are not necessarily those of the Bank of England.
• Ben Bernanke in March 2009 speech “Financial Reform to Address Systemic Risk”

• [we need to] “consider whether the creation of an authority specifically charged with monitoring and addressing systemic risks would help protect the system from financial crises like the one we are currently experiencing”

• This authority would differ in its *field of vision* and its *objectives*
  – Look across the whole financial system and deliver overall stability
Number of Financial Stability Committees, by Year of Formation

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008 + earlier</td>
<td>12</td>
</tr>
<tr>
<td>2009-10</td>
<td>17</td>
</tr>
<tr>
<td>2011</td>
<td>20</td>
</tr>
<tr>
<td>2012</td>
<td>24</td>
</tr>
<tr>
<td>2013</td>
<td>35</td>
</tr>
<tr>
<td>2014</td>
<td>39</td>
</tr>
<tr>
<td>2015</td>
<td>43</td>
</tr>
<tr>
<td>2017</td>
<td>47</td>
</tr>
</tbody>
</table>

Macroprudential Authorities

- **FSC**
  - Formal: 35
  - De facto: 12

- **No FSC**
  - CB is the macroprudential authority: 9
  - PR is the macroprudential authority: 2

Source: Edge and Liang (2019)
Tools used to build lender resilience are used almost everywhere

Borrower resilience tools less likely to be used

<table>
<thead>
<tr>
<th>Country</th>
<th>borrower tool used</th>
<th>lender tool used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Austria</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Belgium</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Canada</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Denmark</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Finland</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>France</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Germany</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ireland</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Israel</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Italy</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Japan</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Korea</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>New Zealand</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Norway</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Spain</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>United States</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: IMF Macroprudential Survey
Motivating questions

• What objective should these FSCs pursue?

• What do they need to do to achieve the objective?
  – What should they be monitoring?
  – Can they focus exclusively on lenders and credit supply?

• Do they have the tools they need?
Model

• Three periods $t = 0, 1, 2$

• A population of heterogeneous consumers, with income shocks at 0 and 1, preferences

\[ E[u(c_{i0}) + u(c_{i1}) + c_{i2}] \]

• A representative bank intermediates between borrowing and lending consumers
Time line

$t = 0$
- Endowment economy
- Incomes $y_{i0}$
- Bank makes loans, take deposits

$t = 1$
- Aggregate shock $\theta$
- Production economy
- Incomes $y_{i1}$ and $y_{i2}$ realized
- Some $i$ defaults
- Bank makes loans, takes deposits

$t = 2$
- Endowment economy
- Debt repaid
Friction 1: Sticky prices

• Sticky prices: output can be below potential

• At $t=1$ each agent has labor supply $\omega_i$

• If aggregate demand is $Y_1 < Y^* \equiv \int_i \omega_i di$

  workers are rationed (proportionally)
Friction 2: Incomplete markets/default

- Consumers hit by uninsurable shocks
- When \( a_1 + y_1 + p_1 y_2 < c^* \) consumers are constrained, cut back spending
- When \( a_1 + y_1 + p_1 y_2 < c \) consumers default
Friction 3: Banks’ moral hazard

• Banks’ balance sheet

\[ p_1 L_2 = N_1 + q_1 D_2 \]

• If banks shirk they make worse quality loans, so we need skin-in-the-game

\[ D_2 \leq \phi L_2 \]

• In equilibrium, if net worth is low, there is a positive credit spread

\[ p_1 < q_1 \]
Feedbacks

Bank

<table>
<thead>
<tr>
<th>Loan portfolio</th>
<th>Deposits</th>
<th>Net worth</th>
</tr>
</thead>
</table>

Credit supply, credit price $p_1$

Consumer demand

Output $Y_1$

Incomes $y_{il}$

Defaults
Credit market equilibrium
Goods market equilibrium
Comparative statics

- Suppose we enter period 1 with a more compressed distribution of net positions $a$
Optimal taxes on $a$

- In period 0 we can intervene by taxing positions $a$, change shape of distribution
- Effects of changing $A(y_0)$

\[
E \left[ u'(c_1) \mid y_0 \right] \mu(y_0) - \xi_B E \left[ \frac{1 - \phi}{p_1 - \phi q_1} \mid y_0 \right] + \ldots
\]
Externalities

- Aggregate demand externality

\[ \ldots + E \left\{ E \left[ u' (\tilde{c}_1) \mu (\tilde{y}_0) \tilde{i} + \frac{1 - \phi}{p_1 - \phi q_1} (1 - \tilde{i}) |\theta\right] \frac{dY_1 (\theta, A)}{dA (y)} \right\} + \ldots \]

- Pecuniary externality

\[ \ldots + E \left\{ E \left[ \left( u' (\tilde{c}_1) \mu (\tilde{y}_0) - \xi_B \frac{1 - \phi}{p_1 - \phi q_1} \right) \tilde{i} \tilde{a}_2 |\theta\right] \frac{dp_1 (\theta, A)}{dA (y)} \right\} + \ldots \]
Results

• Conditional efficiency: no intervention optimal if no GE effects (with appropriate Pareto weights)

• If binary income shock at 0, only one borrower
• Equivalence result: regulating lenders or borrowers is the same

• Equivalence result breaks with more than one borrower type

• Open question: does borrower regulation increase or decrease need for banks’ regulation? (complementarity or substitutability)