Public Bank Lending in Crisis Times

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Agenda

1. Motivation
2. Related literature
3. Empirical results
4. Theoretical model
5. Conclusions
Motivation

• Is there any role for public banks?

• Is there any difference between public and private banks?

• Do they behave the same way during normal and crisis times?

• What are the reasons for the different behavior?
Public Banks in Latinamerica (* Development banks)

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Total Assets (end-2009)</th>
<th>Country</th>
<th>Million USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Banco do Brasil</td>
<td>Brazil</td>
<td>357.615</td>
</tr>
<tr>
<td>2</td>
<td>BNDES*</td>
<td>Brazil</td>
<td>217.752</td>
</tr>
<tr>
<td>3</td>
<td>Caixa Economica Federal</td>
<td>Brazil</td>
<td>196.252</td>
</tr>
<tr>
<td>4</td>
<td>Banco del Estado de Chile</td>
<td>Chile</td>
<td>33.271</td>
</tr>
<tr>
<td>5</td>
<td>Banco de la Nacion Argentina</td>
<td>Argentina</td>
<td>22.695</td>
</tr>
<tr>
<td>6</td>
<td>Nacional Financiera*</td>
<td>Mexico</td>
<td>21.598</td>
</tr>
<tr>
<td>7</td>
<td>Banobras*</td>
<td>Mexico</td>
<td>20.634</td>
</tr>
<tr>
<td>8</td>
<td>Banrisul (Rio Grande do Sul)</td>
<td>Brazil</td>
<td>16.855</td>
</tr>
<tr>
<td>9</td>
<td>Banco de Venezuela</td>
<td>Venezuela</td>
<td>15.432</td>
</tr>
<tr>
<td>10</td>
<td>Banco Bicentenario</td>
<td>Venezuela</td>
<td>13.345</td>
</tr>
<tr>
<td>11</td>
<td>Banco do Nordeste*</td>
<td>Brazil</td>
<td>10.997</td>
</tr>
<tr>
<td>12</td>
<td>Bancomext</td>
<td>Mexico</td>
<td>9.236</td>
</tr>
<tr>
<td>13</td>
<td>Banco de la Provincia de Buenos Aires</td>
<td>Argentina</td>
<td>7.856</td>
</tr>
<tr>
<td>14</td>
<td>Sociedad Hipotecaria Federal</td>
<td>Mexico</td>
<td>7.799</td>
</tr>
<tr>
<td>15</td>
<td>Banco de la Nación</td>
<td>Peru</td>
<td>6.930</td>
</tr>
<tr>
<td>16</td>
<td>Banco Banestes</td>
<td>Brazil</td>
<td>5.141</td>
</tr>
<tr>
<td>17</td>
<td>Banco del Tesoro</td>
<td>Venezuela</td>
<td>4.999</td>
</tr>
<tr>
<td>18</td>
<td>Banco da Amazonia*</td>
<td>Brazil</td>
<td>4.482</td>
</tr>
<tr>
<td>19</td>
<td>BRDE (Extremo Sul)*</td>
<td>Brazil</td>
<td>4.203</td>
</tr>
<tr>
<td>20</td>
<td>Banco de Brasilia</td>
<td>Brazil</td>
<td>3.639</td>
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<tr>
<td>21</td>
<td>Banco de la Ciudad de Buenos Aires</td>
<td>Argentina</td>
<td>3.588</td>
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<tr>
<td>22</td>
<td>Banco Industrial de Venezuela</td>
<td>Venezuela</td>
<td>3.392</td>
</tr>
<tr>
<td>23</td>
<td>Bancoldex*</td>
<td>Colombia</td>
<td>2.759</td>
</tr>
</tbody>
</table>
Ranking Public Banks Share
by Total Assets (end of 2009)
Share of public bank loans
Public bank lending shares increased in all regions, especially in Latin America and Europe.
Nationalization of banks in Europe

- England: Royal Bank of Scotland, HBOS-Lloyds
- Iceland: Kauping, Landsbanki, Glitnir and Icebank
- Ireland: Anglo Irish Bank
- Netherlands: Fortis NL
- Portugal: Banco Portugues de Negocios
Two views

- “Development” view (heterodox)
  - Need of public banks for financial and economic development
  - Alexander Gerschenkron (1962)

- “Political economy” view (orthodox)
  - Public banks generate distortions and soften budget constraint of govt.
  - Thus, privatize public banks
Related literature

  • Argue that public banks cause financial instability and underdevelopment and slow growth (92 countries)

• Andrianova, Demetriades and Shortland (2009) ‘Is government ownership of banks really harmful to growth?’
  • Refutes Laporta et al. (2002) by including institutional quality variable

• Andrianova, Demetriades and Shortland (2008) ‘Government ownership of banks, institutions, and financial development’ JDE
  • Under weak institutional quality, depositors trust more public banks than private banks.
Hypothesis

- Public banks lend more than private banks during and after a financial crisis
- During normal times, they behave the same
- Thus, (new) role for public banks to mitigate effects of crisis on real sector
The data

Bankscope (filtered)

- 560 banks from 52 countries (1994-2009)
- 520 private and 40 public banks
The sample of 560 banks accounts for USD 60 trillion of total assets (2/3 of the global banking system)
Dynamic panel regression

\[
\Delta L_{ijt} = \alpha_1 \Delta L_{ijt-1} + \beta X_{jt} \\
+ \alpha_{PR} + \alpha_{PU} P_{it} + \gamma_{n,PR} Z_{ijt} + \gamma_{n,PU} Z_{ijt} P_{it} \\
+ \delta_{PR} C_{jt} + \delta_{PU} C_{jt} P_{it} + \gamma_{c,PR} Z_{ijt} C_{jt} + \gamma_{c,PU} Z_{ijt} C_{jt} P_{it} + \epsilon_{ijt},
\]

- \(\Delta L_{ijt}\): loan growth in year \(t\) of bank \(i\) in country \(j\)
- \(P_{it}\): public bank dummy
- \(C_{jt}\): crisis dummy
- \(Z_{ijt}\): size, liquidity, capitalization, ST funding
- \(X_{jt}\): country- and time-fixed effects

If \(\delta_{PU} > 0\): public banks lend more than private banks in crises
## Regression results: core coefficients

<table>
<thead>
<tr>
<th>Dummy</th>
<th>Fixed effects</th>
<th>IV - 2GMM</th>
<th>System GMM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coeff.</td>
<td>coeff.</td>
<td>coeff.</td>
</tr>
<tr>
<td></td>
<td>p-val</td>
<td>p-val</td>
<td>p-val</td>
</tr>
<tr>
<td>dummy C</td>
<td>-7.12*** 0.00</td>
<td>-7.82*** 0.00</td>
<td>-5.48*** 0.00</td>
</tr>
<tr>
<td>dummy P</td>
<td>dropped</td>
<td>-4.73*** 0.00</td>
<td>-4.98*** 0.01</td>
</tr>
<tr>
<td>dummy C * P</td>
<td>10.96*** 0.00</td>
<td>9.85*** 0.00</td>
<td>9.40*** 0.00</td>
</tr>
</tbody>
</table>

- **Obs.**: 4926
- **Banks**: 523
- **\(R^2\)**: 0.08
- **AR(2)**: 0.86
- **Hansen**: 0.00
Summary of estimation results

Normal times

• Public banks have lower loan growth than private banks (-4.98%)

Crisis times

• Crisis periods have a strong adverse effect on private bank lending (-5.48%)

• Public banks counteract the credit crunch (+9.4%)
Hypothesis

Reasons different behavior public and private banks:

• Public banks’ objective is not only to maximize profits but also to avoid transmission to the real sector

• Public banks are more likely recapitalized; govt. has more resources than a private banker

• Public banks suffer less deposit withdrawals
Basic model

- **Firm liquidity demand model:** Holmström and Tirole (1998) 'Private and public supply of liquidity’ JPE

- **Consumer liquidity demand model:** Allen and Gale (1998) 'Optimal financial crises’ JF

- **Four agents:** depositors/consumers, firms/entrepreneurs, private bank and public bank.
Setup

• **Entrepreneurs:** stochastic investment project but no liquid funds; outcome in period 2

• **Depositors/Consumers:** deposit initial liquidity in banks; risk neutral but bank leverage averse; consume in period 2

• **Banks:** initial own capital; risk averse; lend to entrepreneurs (investment project) and/or hold liquid funds (no return)

• **Three periods:** period 0 (initial investment); period 1 (observe signal: real variance and real leverage; partial liquidation); period 2 (outcome)
Uncertainty

Information about stochastic shocks

- Initial investment: \( I \) (period 0)
- Stochastic return: \( R \) (period 2)
- \( E(R) \) known with certainty in period 0
- \( V(R) \) NOT known with certainty in period 0
- Signal in period 1: real \( V(R) \)
- Limit leverage: \( LE \equiv \frac{D+A}{A} \leq 1 + \beta 0 - \beta 1 \frac{V(R)}{A} \)
Result

• **Partial liquidation (period 1):** Investment project continued smaller scale; conversion into liquid funds; due to optimal bank decision and/or withdrawal of deposits

• Normal times (no partial liq.): \( V_1(R) \leq V_0(R) \)

• Financial crisis (partial liq. by optimal bank decision): \( V_0(R) < V_1(R) < \bar{V}(R) \)

• Severe financial crisis (partial liq. by withdrawal of deposits): \( V_1(R) > \bar{V}(R) \)
Period 1

Consumers’ objective function

\[\max_{C_2} E(C_2)\]  \hspace{1cm} (1)

s.t.

\[C_2 \leq D_{1PR} + D_{1PU} + LF_1\]  \hspace{1cm} (2)

\[D_{1PR} + D_{1PU} + LF_1 = D_{0PR} + D_{0PU} + LF_0\]  \hspace{1cm} (3)

\[D_{1PR} \leq \beta_{0PR}A_0 - \beta_{1V_1}(R)\]  \hspace{1cm} (4)

\[D_{1PU} \leq \beta_{0PU}(A_0 + \Delta A_{1PU}) - \beta_{1V_1}(R)\]  \hspace{1cm} (5)
Period 1

Private banks’ objective function

$$\max_{\delta_{PR}} \delta_{PR} E(R) l_{PR} + (1 - \delta_{PR}) l_{PR} - \frac{\gamma}{2} \delta_{PR} l_{PR}^2 V_1(R)$$

s.t.

$$D0_{PR} - D1_{PR} \leq S0_{PR} + (1 - \delta_{PR}) l_{PR}$$

$$0 \leq \delta_{PR} \leq 1$$

Public banks’ objective function

$$\max_{\delta_{PU}} \delta_{PU} E(R) l_{PU} + (1 - \delta_{PU}) l_{PU} - \theta(1 - \delta_{PU}) l_{PU}$$

$$- \frac{\gamma}{2} \delta_{PU} l_{PU}^2 V_1(R)$$

s.t.

$$D0_{PU} - D1_{PU} \leq S0_{PU} + (1 - \delta_{PU}) l_{PU}$$

$$0 \leq \delta_{PU} \leq 1$$
Differences between Public and Private Banks

- $-\theta(1 - \delta_{PU})l_{PU}$: public banks’ disutility of partially liquidating investment projects

- $\Delta A_{1PU}$: higher recapitalization of public banks than private banks (obtain liquidity by taxation)

- $\beta_{0PU} > \beta_{0PR}$: depositors trust more public banks and accept a higher leverage (less leverage averse)
Continuation of the investment project

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Liquid funds holding by banks
Deposits and liquid funds holding by consumers
Lending decisions by banks

Graph showing the total lending by banks $L_1$ against the leading economic indicator $V_1(R)$. The graph distinguishes between normal, crisis, and severe crisis periods. The solid line represents private banks, and the dashed line represents public banks.
Conclusions

- Public banks lend more than private banks during crisis periods
- Role for public banks to avoid financial crises spreading to real sector
- Role for public banks in recovery of real sector after a crisis
- Public bank credit integral part for successful monetary policy