A Financial System Perspective on Japan’s Experience in the Late 1980s

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Objectives

• Reconsider Japan’s late 1980s experience in light of lessons from US subprime crisis
• Adopt “financial system perspective” (FSP)
  – Determination of credit supply in a financial system as a whole
  – Key: interlocking balance sheets of banking sector and non-financial sectors under the financial liberalization
• Draw lessons for prudential policy and monetary policy
Japan’s Late 1980s Experience in FSP

• Role of large firms channeling funds from capital markets to banking sector
  – Raise funding in securities market
  – Lend on to banking sector as time deposits

• Made possible by
  – Progress in financial liberalization in securities market and banking sector
  – Accommodative monetary policy
Japan’s Late 1980s Experience in FSP (cont)

• Common to the US subprime crisis
  – New securities behind the increase in supply of overall credit
  – Integration of the commercial banking sector with the capital markets
Financial System Perspective
Stylized Financial System

end-user borrowers

households

firms

firms

loans

banking sector

equity
debt claims

outside claim holders
Post Liberalization

- end-user borrowers
  - households
  - firms

- outside claim holders
  - equity
  - debt claims

- banking sector
  - loans
  - deposits

- equity and securities

firms
Growth of Credit Supply (1)

- end-user borrowers
  - households
  - firms

- banking sector
  - loans
  - deposits

- outside claim holders
  - equity
  - debt claims
  - equity and securities

- firms
  - equity and securities
Growth of Credit Supply (2)

end-user borrowers

financial intermediary sector

loans

banking sector

deposits

equity

debt claims

equity and securities

outside claim holders

households

firms

firms
Credit Supply

\[ \sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i \left(1 + z_i \left(\lambda_i - 1\right)\right) \]

\( y_i \): lending of bank \( i \) to ultimate borrowers plus holding of real assets
\( e_i \): equity of bank \( i \)
\( \lambda_i \): leverage of bank \( i \) (ratio of total assets to equity)
\( z_i \): proportion of bank \( i \)’s funding that comes from outside the banking system
\( n \): number of banks in the banking system
## Individual Bank Balance Sheet

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans to firms, households</td>
<td>Liabilities to non-banks (e.g. deposits)</td>
</tr>
<tr>
<td>Claims on other banks</td>
<td>Liabilities to other banks</td>
</tr>
<tr>
<td></td>
<td>Equity</td>
</tr>
</tbody>
</table>

**Individual bank**
## Balance Sheet for Banking Sector

### Assets

- Total lending to Firms and households

### Liabilities

- Total liabilities to non-banks (e.g. deposits)
- Total equity

### Banking sector

\[ \sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i (1 + z_i (\lambda_i - 1)) \]

\[ \Rightarrow \sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i + \sum_{i=1}^{n} D_{i}^{NFI} \]
# Leverage of Financial System

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total lending to</td>
<td>Total Liabilities to non-banks</td>
</tr>
<tr>
<td>Firms and households</td>
<td>(deposits + securitized debt)</td>
</tr>
<tr>
<td></td>
<td>Total equity</td>
</tr>
</tbody>
</table>

Leverage is ratio

**Total assets:**equity

Increase of liabilities to non-financial sectors with securitized debt
Comparison in FSP

\[ \sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i (1 + z_i (\lambda_i - 1)) \]

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>( e_i )</td>
<td>-</td>
<td>↑</td>
</tr>
<tr>
<td>( z_i )</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>( \lambda_i )</td>
<td>↑</td>
<td>↓</td>
</tr>
<tr>
<td>( n )</td>
<td>(↑)</td>
<td>(↑)</td>
</tr>
</tbody>
</table>
Case of US Subprime Crisis
On $Z_i$: Holders of US GSE Securities
Foreign Holding of US GSE Securities
Funding Source for GSE Securities
Funding Source for GSE Securities

proportion held by
intermediaries

proportion held by
ultimate claimants
Case of Japan’s Late 1980s
Preceding Studies and This Paper

• Empirical features and insights are discussed by preceding studies

• This paper discusses them in a financial system perspective
## Security Financing by Listed Firms, 1972-98

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Securities (million yen)</th>
<th>Distribution (%)</th>
<th>Foreign Bonds as %</th>
<th>Foreign Bonds as %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Stock</td>
<td>Bonds</td>
<td>as % of Total</td>
</tr>
<tr>
<td>1972</td>
<td>1,784,689</td>
<td>58.4</td>
<td>41.6</td>
<td>0.0</td>
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<tr>
<td>1973</td>
<td>2,240,766</td>
<td>41.9</td>
<td>58.1</td>
<td>0.1</td>
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<tr>
<td>1974</td>
<td>1,741,396</td>
<td>31.2</td>
<td>68.8</td>
<td>3.4</td>
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<tr>
<td>1975</td>
<td>3,187,449</td>
<td>31.4</td>
<td>68.6</td>
<td>11.7</td>
</tr>
<tr>
<td>1976</td>
<td>2,302,001</td>
<td>29.9</td>
<td>70.1</td>
<td>18.1</td>
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<tr>
<td>1977</td>
<td>2,543,740</td>
<td>36.3</td>
<td>63.7</td>
<td>14.7</td>
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<tr>
<td>1978</td>
<td>2,972,270</td>
<td>30.2</td>
<td>69.8</td>
<td>16.4</td>
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<tr>
<td>1979</td>
<td>3,298,028</td>
<td>28.9</td>
<td>71.1</td>
<td>24.0</td>
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<tr>
<td>1980</td>
<td>2,883,285</td>
<td>36.5</td>
<td>63.5</td>
<td>24.1</td>
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<tr>
<td>1981</td>
<td>4,400,028</td>
<td>43.8</td>
<td>56.2</td>
<td>19.8</td>
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<tr>
<td>1982</td>
<td>4,084,502</td>
<td>33.0</td>
<td>67.0</td>
<td>27.7</td>
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<tr>
<td>1983</td>
<td>4,048,420</td>
<td>19.8</td>
<td>80.2</td>
<td>44.8</td>
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<tr>
<td>1984</td>
<td>5,409,408</td>
<td>19.3</td>
<td>80.7</td>
<td>44.0</td>
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<tr>
<td>1985</td>
<td>6,890,503</td>
<td>12.5</td>
<td>87.5</td>
<td>51.0</td>
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<tr>
<td>1986</td>
<td>8,395,196</td>
<td>10.4</td>
<td>89.6</td>
<td>48.2</td>
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<tr>
<td>1987</td>
<td>14,455,291</td>
<td>20.8</td>
<td>79.2</td>
<td>39.9</td>
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<tr>
<td>1988</td>
<td>17,636,098</td>
<td>27.1</td>
<td>72.9</td>
<td>30.5</td>
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<tr>
<td>1989</td>
<td>28,410,407</td>
<td>31.1</td>
<td>68.9</td>
<td>41.4</td>
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<tr>
<td>1990</td>
<td>14,441,448</td>
<td>26.3</td>
<td>73.7</td>
<td>35.8</td>
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<tr>
<td>1991</td>
<td>12,500,454</td>
<td>6.5</td>
<td>93.5</td>
<td>63.5</td>
</tr>
<tr>
<td>1992</td>
<td>9,619,910</td>
<td>4.4</td>
<td>95.6</td>
<td>60.2</td>
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<tr>
<td>1993</td>
<td>11,143,567</td>
<td>7.4</td>
<td>92.6</td>
<td>45.0</td>
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<tr>
<td>1994</td>
<td>8,499,604</td>
<td>11.0</td>
<td>89.0</td>
<td>22.6</td>
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<tr>
<td>1995</td>
<td>8,094,650</td>
<td>7.9</td>
<td>92.1</td>
<td>23.2</td>
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<tr>
<td>1996</td>
<td>13,616,878</td>
<td>15.2</td>
<td>84.8</td>
<td>18.3</td>
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<tr>
<td>1997</td>
<td>10,162,545</td>
<td>11.4</td>
<td>88.6</td>
<td>23.4</td>
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<tr>
<td>1998</td>
<td>15,906,750</td>
<td>9.7</td>
<td>90.3</td>
<td>10.0</td>
</tr>
</tbody>
</table>
Fundraising by Private Non-financial Corporations (Securities)
Financial Investments by Private Non-financial Corporations (currency & deposits)
Net Financial Position of Private Non-financial Corporations
Manufacturing Firms’ Liquidity Ratio
= (cash and deposits + securities assets) / sales
Time Deposit Rates and Prime Lending Rates

Introduction of time deposits with liberalized interest rates
Abolishment of regulation on time deposit interest rates

3-6 month time deposit rate (unregulated, new receipts)
Short-term prime lending rate
Long-term prime lending rate
3 month time deposit rate (regulated, new receipts)
CP-Deposit Arbitrage

• BOJ (1989)
  – Interest rate margins between CPs and time deposits with liberalized interest rate for large non-financial firms

• De Brouwer (1996)
  – Interest rate margins between CPs and CDs for large non-financial firms
Share of Time Deposits in Total Outstanding Deposits
Average Maturity of Time Deposits

Months

1985 86 87 88 89 90 91 92 93 94 95

15 10 5 0

Ratio of Long-term Loans to Total Outstanding Loans

City banks
Regional banks
Assets and Liabilities
(Large Enterprises, All Industries)
(y-o-y difference)
Assets and Liabilities
(Medium-sized Enterprises, All Industries)
(y-o-y difference)
Assets and Liabilities
(Large Enterprises, Manufacturing Industries)
(y-o-y difference)
Breakdown of Corporate Borrowers by Size

- Large enterprises
- Medium-sized enterprises
- Small enterprises

Year: 1975, 80, 85, 90
Bank Lending to Real Estate-Related Sectors
Loan Default Rate

Bubble period
Composition of Bank Capital

- Undivided profits
- Voluntary reserves
- Retained surplus
- Capital reserves
- Common stock
Common Stock and Capital Reserves

![Graph showing the trend of Common Stock and Capital Reserves from 1975 to 1995. The y-axis represents Trillion yen, and the x-axis represents years from 1975 to 1995. The graph compares All domestically licenced banks and City banks.]
Macroeconomic Backdrop

• Financial Liberalization
  – Securities market
  – Banking sector

• Expectations of continued easy monetary policy
  – Government commitment
  – International context
Policy Lessons

• Need for more comprehensive assessment of financial institutions
  – Some selected indicators (CAR, leverage, etc) can be misleading
  – FSP: balance sheet perspective for understanding changes in the financial system
  – Need to monitor broader balance sheet quantities for understanding banks’ behaviors

• Role of prudential policy communication
Policy Lessons (continued)

• Role of commitment in monetary policy
  – Debate on monetary policy “transparency” has been limited to expectations of long rates
  – Need to consider desirability of artificial compression of risk spreads

• Role of short term rates in determining funding costs for financial intermediaries
  – Short rates matter in their own right