Leverage Constraints and the International Transmission of Shocks
Discussion

Tommaso Monacelli
Università Bocconi, IGIER and CEPR

Advances in International Macroeconomics
Bruxelles, July 2010
Great paper!

- Likely to become a workhorse model of the finance-based international transmission of shocks..
- Yet only a starting point
Relevance of the paper

- Standard equilibrium **complete market** model: ↑ financial integration → ↓ cross-country correlation of output
- Why? Risk-sharing /insurance: need world output to be constant across states.
Ingredients of the paper

1. Equity trade (necessary but not sufficient!)
2. Leverage constraints on equity investors
Benchmark (con’t)

- Asset (equity) in **fixed** supply
- **Two sectors** (two agents):
  1. home production: $G\left(k^s\right)$ (savers)
  2. final good production: $AF\left(k^i\right)k_i + k^i$ (investors)
Equilibrium with frictionless markets

\[ G'(k^s) = A_H F'(k^i) \]

mpk in home production \hspace{1cm} mpk in final good production

\[ k^s + k^i = K \]

fixed supply

- 2 equations in 2 unknowns \((k^s, k^i)\)
- Intra-national and inter-national Modigliani-Miller applies
Dynamics in the frictionless model

- Negative productivity shock: $\downarrow A$
- Redistribution of asset from final good to home production sector:
  - $\uparrow k^s$ $\downarrow k^i$
- Asset price falls:
  - $\downarrow q$
Key: what happens to the asset price in Foreign?

- If **no** equity trade, countries completely insular
- With equity trade: asset returns need to be equalized →

\[ q^* \]

- Yet **no effect** whatsoever on the sectoral (cross-agent) redistribution of assets
With Leverage Constraints

- Financial conditions matter for foreign investors’ demand of capital

\[ \downarrow q^* \rightarrow \downarrow \text{collateral value} \rightarrow \downarrow b^* \rightarrow \downarrow k_i^* \]

- Final good production correlated across countries
Is this a model of the Financial Crisis? Not sure.

Lacks a few elements

1. "Shadow banks" and interbank/repo market
2. Maturity mismatch and liquidity problem
3. The "right" shock
Financial intermediaries

→ Current crisis: key role of balance-sheet effects of banks
Figure 1.3. Ratio of Debt to GDP Among Select Advanced Economies
(In percent, GDP-weighted, 1987 = 100)
Key element in the crisis

- **Liquidity** problem for "new" financial intermediaries

<table>
<thead>
<tr>
<th>traditional banks</th>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;investment&quot; banks</td>
<td>long-term loans</td>
<td>deposits</td>
</tr>
<tr>
<td></td>
<td>MBS</td>
<td>short-term debt</td>
</tr>
</tbody>
</table>
Boom of securitized products

- Used as collateral in interbank/repo markets

<table>
<thead>
<tr>
<th>Fraction of AAA rated securities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>securitized products</td>
<td>60%</td>
</tr>
<tr>
<td>corporate bonds</td>
<td>1%</td>
</tr>
</tbody>
</table>

(source Fitch, 2007)
Gigantic maturity mismatch

- Banks held **long-term** assets (e.g., MBS) financed via **short-term** debt (e.g., commercial paper)
- When things deteriorate it is the **liquidity** problem that matters
Two key problems

1. Securitization diversifies *idiosyncratic* risk, but increases sensitivity to *aggregate* risk.
2. Interbank repo market much more sensitive to *runs /panic attacks* than commercial banks market.
Dynamics of crisis

Bad shock (*what is this??*)

$\rightarrow$ Financial conditions deteriorate

$\rightarrow$ Lenders reduce exposure $\rightarrow$ Ask to service debt

$\rightarrow$ Banks try to **fire sale** long-term illiquid assets
Liquidity friction

- At least as crucial as borrowing friction
- Is it "fire-sale per se" or is it "fire sale" of long-term illiquid assets?  

→ Requires modelling of:
  (i) **Interbank** market
  (ii) **Maturity** of assets
Sketch of a model with two ingredients

- "Banks sudden stop"
- Shock to haircut margins
Agents

- **Savers**

\[ c_{s,t} + d_t = r_{t-1}^d d_{t-1} + w_t \]

- **Entrepreneurs**

\[ c_{e,t} + q_t (k_{e,t} - k_{e,t-1}) + \frac{1}{m} \sum_{k=1}^{m} r_{t-k}^l(m) l_{t-k}(m) = l_t(m) + y_t \]

\[ r_t^l(m) l_t(m) \leq (1 - \chi) \mathbb{E}_t \{ k_{e,t+m-1} q_{t+m} \} \]

long-term loans

collateral constraint
Commercial banks

\[ b_t + \Phi(b_t) = d_t \]
Banks (con’t)

- **Investment banks**

\[ V(b_{t-1}, l_{t-k}, \gamma_t) = \max_{x_t, b_t, l_t} [x_t + \beta_x \mathbb{E}_t \{ V(b_t, l_t, \gamma_{t+1}) \}] \]

\[ x_t = b_t + \frac{1}{m} \sum_{k=1}^{m} r^l_{t-k}(m) l_{t-k}(m) - l_t(m) \]

s.t. **haircut constraint:**

\[ r^b_t b_t \leq (1 - \gamma_t) l_t(m) \]

short-term borrowing \hspace{1cm} haircut shock

- **Banks’ sudden stop:** haircut constraint becomes (endogously) binding