Discussion of “Financial Crises and Risk Premia” by Tyler Muir

Hyun Song Shin

Philadelphia AEA meeting
January 2014
This Paper

- Poses fundamental questions
- Formulates simple, elegant model
- Makes persuasive case that constraints on intermediaries are crucial

There are implications for macro more broadly, as well as for asset pricing
Figure 7: I plot the log of the ratio of intermediary equity to GDP (black line, right axis, decreasing scale) which is the state variable in the model, along with the subsequent 5 year excess return on the market (gray line, left axis). Intermediary equity is defined as the total market capitalization of the financial sector (SIC code of 6). The intermediary equity to GDP series is linearly detrended. The model implies that intermediary equity should forecast returns.
Figure 1. Stylized Flow of Funds
Figure 2. Shut off direct financing by households
Discussion of Tyler Muir

Figure 3. Consolidate intermediaries and entrepreneurs
Figure 4. Consolidated entity holds real assets
Figure 5. Merge banks, mutual funds and other financial institutions into one sector that operates real assets.
Figure 6. Then impose an equity constraint on the merged entity and give it log preferences.
Given log preferences,

\[
\text{Leverage} = \frac{\mu_{R,t} - r_t}{\sigma_{R,t}^2}
\]

But equity constraint is modeled so that

\[
\mu_{R,t} - r_t = \frac{p(e_t)}{e_t} \sigma_{R,t}^2
\]

Leverage is the **risk aversion coefficient** of a fictitious mean-variance **optimizer**, whose risk-aversion depends on the level of equity

\[
\text{Leverage} = \frac{p(e_t)}{e_t}
\]

Leverage is high when \( e \) is low, and becomes very high as \( e \) becomes small.
Assets or Enterprise Value?

Enterprise value is defined as

\[
\text{Enterprise value} = \text{market capitalization} + \text{debt}
\]

- Enterprise value addresses *how much a bank is worth*
- Total assets address *how much a bank lends*
Figure 7. The left panel shows the scatter chart of the asset-weighted growth in book leverage and total assets for the eight largest US broker dealers and banks. The right panel is the scatter for the asset-weighted growth in enterprise value leverage and enterprise value. Enterprise value is the sum of market capitalization and debt, and enterprise value leverage is the ratio of enterprise value to market capitalization. The dark dots are for 2007 - 2009. The eight institutions are Bank of America, Citibank, JP Morgan, Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley (Source: SEC 10Q filings).
Are we missing something by focusing only on enterprise values?

- Peculiarity of banks

- Information conveyed by book values
Figure 8. Stylized Flow of Funds
Equity claims on borrowers, deposits, and corporate bonds involve real assets and debt. Entrepreneurs and intermediaries facilitate these transactions. Household funds flow through these mechanisms.

Figure 9. Stylized Flow of Funds
Figure 10. Stylized Flow of Funds
Figure 11. Credit to US non-financial corporate business sector (left) and non-financial non-corporate business sector (right) (Source: Federal Reserve Flow of Funds, Tables L102, L103)
Figure 12. Weighted-Average Effective Loan Rate for More than 365 Days, Moderate Risk, All Commercial Banks (EELMNQ), the effective Fed Funds rate and the spread between the two. (Source: Federal Reserve survey of business lending conditions)
Trend Component of Log Real Gross Domestic Product
Seasonally Adjusted

Source: U.S. Bureau of Economic Analysis
Cooley−Rupert Economic Snapshot; http://econsnapshot.wordpress.com
Real Personal Consumption Expenditures
Percentage change from previous peak, Seasonally Adjusted

Quarters from previous peak

- 1973 cycle
- 1981 cycle
- 1990 cycle
- 2001 cycle
- Current cycle

Cooley–Rupert Economic Snapshot; www.econsnapshot.com
U.S. Bureau of Economic Analysis
Real Gross Private Domestic Investment

Percentage change from previous peak, Seasonally Adjusted

Quarters from previous peak

1973 cycle
1981 cycle
1990 cycle
2001 cycle
Current cycle
Real Private Residential Fixed Investment
Percentage change from previous peak, Seasonally Adjusted

Cooley–Rupert Economic Snapshot; www.econsnapshot.com
U.S. Bureau of Economic Analysis
Book Value and Market Value

Market value of assets = book value of assets × price

ΔMarket value = Δbook × price + Δprice × book

What moves market values?
Figure 13. Market value change due to price change and book value change
Figure 14. The left panel shows the scatter chart of the changes in debt and book equity to changes in assets for the largest eight US broker dealers and banks. The right panel is for the changes in market capitalization and debt to changes in enterprise value. Enterprise value is the sum of market capitalization and debt. The eight institutions are Bank of America, Citibank, JP Morgan, Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley (Source: SEC 10Q filings).
Book Values Matter for Asset Pricing

- Leveraged investors need to borrow

- Book value of bank assets convey information on financial conditions facing leveraged investors
Figure 15. Book value of assets matter also for financial conditions facing leveraged investors.
Figure 16. **Book leverage of broker dealers explains cross-section of asset returns:** Adrian, Etula and Muir (2013)
Adrian, Moench and Shin (2013)

<table>
<thead>
<tr>
<th></th>
<th>$y_{BDblevg}$</th>
<th>$y_{BDmlevg}$</th>
<th>$y_{BDbeg}$</th>
<th>$y_{BDmeg}$</th>
<th>$y_{CBblevg}$</th>
<th>$y_{CBmlevg}$</th>
<th>$y_{CBbeg}$</th>
<th>$y_{CBmeg}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT</td>
<td>-0.070***</td>
<td>0.012</td>
<td>0.044*</td>
<td>-0.009</td>
<td>-0.276</td>
<td>0.027</td>
<td>0.051</td>
<td>-0.018</td>
</tr>
<tr>
<td></td>
<td>[-2.857]</td>
<td>[0.342]</td>
<td>[1.761]</td>
<td>[-0.268]</td>
<td>[-1.377]</td>
<td>[0.658]</td>
<td>[0.254]</td>
<td>[-0.540]</td>
</tr>
<tr>
<td>BAA</td>
<td>-0.026**</td>
<td>0.014</td>
<td>0.014</td>
<td>-0.021</td>
<td>-0.159</td>
<td>0.020</td>
<td>-0.098</td>
<td>-0.017</td>
</tr>
<tr>
<td></td>
<td>[-2.122]</td>
<td>[0.819]</td>
<td>[1.086]</td>
<td>[-1.216]</td>
<td>[-1.595]</td>
<td>[0.992]</td>
<td>[-0.988]</td>
<td>[-1.008]</td>
</tr>
<tr>
<td>CMT10</td>
<td>0.008</td>
<td>0.006</td>
<td>-0.006</td>
<td>-0.006</td>
<td>-0.137</td>
<td>0.001</td>
<td>-0.002</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>[0.593]</td>
<td>[0.312]</td>
<td>[-0.475]</td>
<td>[-0.329]</td>
<td>[-1.277]</td>
<td>[0.049]</td>
<td>[-0.017]</td>
<td>[-0.004]</td>
</tr>
</tbody>
</table>

**Book leverage** of broker dealers informative of one-quarter ahead asset returns

But **market leverage, market equity** and **book equity** are either uninformative or of the wrong sign
Some Lessons

• Focusing on constraints faced by intermediaries is surely right

But...

• Don’t neglect book values
  – Book values matter for asset pricing, but especially for macro applications
  – Book values imply a role for quantities as well as for prices

• Banks (and shadow banks) are special, and book values of bank balance sheets matter
  – Bank liability aggregates - core and non-core - convey information on financial conditions