Discussion

Asset Collateralizability and the Cross-Section of Expected Returns

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This paper proposes a $Q$-theory with financial frictions, focusing on cross-sectional implications.

- An important and active research area.

- Proposes that tangible assets provide hedging against financing constraints.

- Shows that firms with more tangible assets have lower returns.
Mechanism

Firms use tangible (K) and intangible (H) assets as input factors in production:

\[ Y_t = A_t \left( K_t^\phi H_t^{1-\phi} \right)^\alpha L_t^{1-\alpha}. \]

A fraction of \((1 - \lambda)\) firms die and are replaced by new ones.

Loans use K but not H as collateral.

\[
V_0 = \max_{\{N_{t+1}, K_{t+1}, H_{t+1}, B_t\}_{t=0}^{\infty}} E_0 \left[ \sum_{t=1}^{\infty} M_{0,t} \lambda^{t-1} (1 - \lambda) N_t \right]
\]

\[ N_t + B_t = q_t K_{t+1} + p_t H_{t+1}, \quad t \geq 0 \]

\[ N_{t+1} = R^K_{t+1} q_t K_{t+1} + R^H_{t+1} p_t H_{t+1} - R^f_t B_t, \quad t \geq 0 \]

\[ B_t \leq \zeta q_t K_{t+1}, \quad t \geq 0 \]
Mechanism

- Under financing constraints, investments are blow the first-best case.

- Firms with higher tangibility can borrow and invest more in tangible assets which allow for further borrowing.
  - Credit multiplier

- Tangibility acts as buffer against borrowing constraints.

- Higher tangibility lowers expected distress costs.

- Hence, higher tangibility leads to lower returns.
Comment 1: Alternative thoughts

- Stock returns might increase with collateralizability.
  - Tangibility makes it difficult for firms to substitute high-risk assets with low-risk ones.
  - Especially when disinvestment is costly (Zhang, 2005).
  - Firms with higher debt capacity also have higher exposure to the changes in external funding conditions (Hahn and Lee, 2009).
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- Needs a structural model to disentangle those effects.
Comment 2: Empirics

- Conceptually, story works for financially constrained firms only.
  - But we do see similar, though weaker, empirical results for unconstrained firms.
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- Other factors predict leverage
  - Industry median, profits, and tangibility (Frank and Goyal, 2009)
  - Peer effects (Leary and Roberts, 2014)
  - How to control these? By Fama-French factors?
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- Zero leverage firms
  - Strebulaev and Yang (2013): 10.2% public nonfinancial US firms have zero leverage and about 22% have less than 0.05 book leverage.
Comment 3: Numerical computing

- Solving the model, especially computing asset prices, with Dynare?
  - Dynare is OK for macro quantities, but often less precise for asset prices.
  - In particular, tangibility constraint creates a kink in this model.
  - Perturbation method can’t capture the discontinuous area, which is important in this model.
### Comment 4: Calibration results

<table>
<thead>
<tr>
<th>Moments</th>
<th>Data</th>
<th>Benchmark</th>
<th>Frictionless</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\sigma(\hat{M})$</td>
<td></td>
<td>104.59</td>
<td>94.31</td>
</tr>
<tr>
<td>$E[R^f]$</td>
<td>1.20 (0.16)</td>
<td>0.83</td>
<td>1.14</td>
</tr>
<tr>
<td>$\sigma(R^f)$</td>
<td>0.97 (0.31)</td>
<td>0.81</td>
<td>0.84</td>
</tr>
<tr>
<td>$E[R_{L,K}^L - R_f^f]$</td>
<td>1.58</td>
<td>1.26</td>
<td></td>
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<tr>
<td>$\sigma(R_{L,K}^L)$</td>
<td>2.34</td>
<td>1.65</td>
<td></td>
</tr>
<tr>
<td>$E[R_{L,H}^L - R_f^f]$</td>
<td>6.73</td>
<td>2.91</td>
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<tr>
<td>$\sigma(R_{L,H}^L)$</td>
<td>4.66</td>
<td>2.61</td>
<td></td>
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<tr>
<td>$E[R_{L,H}^L - R_{L,K}^L]$</td>
<td>4.80 (2.04)</td>
<td>5.15</td>
<td>1.65</td>
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<tr>
<td>$E[R^M - R_f^f]$</td>
<td>5.71 (2.25)</td>
<td>3.50</td>
<td>1.79</td>
</tr>
</tbody>
</table>
Comment 5: Consider firm heterogeneity?

Cross-sectional implications?

- Empirical results: Cross-sectional stock return variations due to different asset tangibility.
- But the model is calibrated over ONE firm and compares the returns to tangible and intangible assets.
  - Stock return = weighted average returns to tangible and intangible assets, the risk-free rate
  - The difference of returns to tangible and intangible assets ≠ the stock return variations in empirical exercises
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- Can we replicate the cross-sectional stock return variations documented?
  - For example, adding idiosyncratic shocks...
Conclusions

Very interesting thoughts and results!

- A very promising area: Q-theory with credit constraints on investment.
  - Li, Liu, and Xue (2014)

- Illustrating higher tangibility may hedge against the aggregate credit condition.