

## Discussion

# Asset Collateralizability and the Cross-Section of Expected Returns

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# This paper

- 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:

$$Y_t = A_t (K_t^\phi H_t^{1-\phi})^\alpha L_t^{1-\alpha}$$

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

Loans use  $K$  but not  $H$  as collateral.

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

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

$$N_{t+1} = R_{t+1}^K q_t K_{t+1} + R_{t+1}^H p_t H_{t+1} - R_t^f B_t, t \geq 0$$

$$B_t \leq \zeta q_t K_{t+1}, t \geq 0$$

# Mechanism

- Under financing constraints, investments are below 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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  - Firms with higher debt capacity also have higher exposure to the changes in external funding conditions (Hahn and Lee, 2009).
- Needs a structural model to disentangle those effects.

## Comment 2: Empirics

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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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- Other factors predict leverage
  - Industry median, profits, and tangibility (Frank and Goyal, 2009)
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  - How to control these? By Fama-French factors?
- 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

Moments	Data	Benchmark	Frictionless
$\sigma(\tilde{M})$		104.59	94.31
$E[R^f]$	1.20 (0.16)	0.83	1.14
$\sigma(R^f)$	0.97 (0.31)	0.81	0.84
$E[R^{L,K} - R^f]$		1.58	1.26
$\sigma(R^{L,K})$		2.34	1.65
$E[R^{L,H} - R^f]$		6.73	2.91
$\sigma(R^{L,H})$		4.66	2.61
$E[R^{L,H} - R^{L,K}]$	4.80 (2.04)	5.15	1.65
$E[R^M - R^f]$	5.71 (2.25)	3.50	1.79

## 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  $\neq$  the stock return variations in empirical exercises

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  - Stock return = weighted average returns to tangible and intangible assets, the risk-free rate
  - The difference of returns to tangible and intangible assets  $\neq$  the stock return variations in empirical exercises
- 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.