Discussion of “Which Financial Frictions?” by T. Adrian, P. Colla and H. Shin

Guido Lorenzoni

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Heterogeneity

- Models with financial frictions distinguish "special" agents from other investors
- E.g. Kiyotaki-Moore "farmers" and "gatherers"

- Special agents: can extract more utils from some asset, so they are that asset's natural buyers

- Crucial observation: the balance sheet of these agents matters
- In applications to banking, the special agents are the banks
- What is the source of this heterogeneity?
  - Differences in technology (Kiyotaki-Moore)
  - Differences in beliefs (Geanakoplos)
  - Differences in risk-aversion (Garleanu-Pedersen, this paper)

Leverage

Initial balance sheet

$$n = (p + d)\, k - (1 + r)\, b$$

Balance sheet after investment decision

$$pk' = n + b'$$

If shock to asset price

$$\Delta n = \Delta p \cdot k$$

Leverage

$$L = \frac{b'}{pa'}$$

In standard balance sheet models L does not move much

$$\Delta\left[pk\right] \approx \frac{1}{1-L} \cdot \Delta n$$

ACS: for banking sector is mostly

$$\Delta\left[pk\right] \approx \Delta\left[\frac{1}{1-L}\right] \cdot n$$

- Maybe we should look at elasticities rather than level changes

$$\frac{\Delta\left[pk\right]}{pk} \approx \frac{\Delta\left[\frac{1}{1-L}\right]}{\frac{1}{1-L}} \cdot n + \frac{1}{1-L} \cdot \frac{\Delta n}{n}$$

- Marginal leverage versus average leverage

- What really matters for transmission mechanism is how a dollar of capital that frees up can be reinvested

- Example household: average leverage is countercyclical because b and k do not move much while p moves

- However, does it mean that a household could buy, say, a car with the same downpayment when house prices go down?

- For a pure security firm, marginal leverage $=$ average leverage $=$ margin

Value at risk

Model idea: relation between risk, leverage, and risk premia

Risk goes up $\rightarrow$ VaR banks delever $\rightarrow$
$\rightarrow$ Risk averse investors have to step in $\rightarrow$ Risk premia go up

Relatively inelastic supply of risky asset (demand of funds by risky borrowers)

Here: explore feedback from leverage to risk
(Brunnermeier-Pedersen)

Risk feedback

- Tree in unit supply with dividends d_t i.i.d.
- d_t continuous density on $[0, \infty)$
- Bonds in zero net supply

- Infinitely lived risk averse agents with log utility
- OLG of risk neutral agents born with d_t

$$p_t k_t^N = d_t + b_t$$

- collateral constraint

$$(1 + r_t)\, b_t \leq \lambda p_t k_t^N$$

VaR

- How is λ determined?

$$\Pr\left[p_{t+1} \leq \lambda p_t\right] = \alpha$$

- Extreme case $\alpha = 0$
- Liabilities of risk neutral agent must be perfectly safe

Market clearing

$$k_t^N + k_t^A = 1$$

Two equilibria

Good equilibrium

- no price risk

$$
\begin{aligned}
p_t &= \frac{\beta}{1-\beta} E\left[d_{t+1}\right] \\
1 + r_t &= 1/\beta
\end{aligned}
$$

- $\lambda = 1$ so risk neutral agents hold all risk
- risk averse agents only hold bonds, $k_t^A = 0$

Two equilibria (continued)

Bad equilibrium

- price risk

$$p_t = \frac{\beta}{1-\beta} d_t$$

- $\lambda = 0$ risk neutral agent cannot lever at all, they only buy a fixed fraction of trees with their endowment
- risk averse agents only hold risky trees, $k_t^A > 0$ constant