Pre-recording:
Vol paradox and shameless self-publicity

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Volatility paradox

Financial frictions models may also explain the 'paradox of calm'

- Brunnermeier and Sannikov coined the phrase 'volatility paradox' to convey the idea that financial fragilities build up in calm times, and then manifest in crises
- The 'paradox' (not that paradoxical really) is that it's when things seem nice - supportive policy, lots of liquidity, narrow spreads, calm markets - that problems are developing
- See also Adrian and Shin (2013), Adrian and Boyarchenko (2015)

We argue that it is typical for the system to enter into occasional volatile episodes away from the steady state because risk-taking is endogenous. [Financial] experts choose their leverage endogenously in response to the riskiness of the assets they hold. Thus, assets with lower fundamental uncertainty result in greater leverage. Paradoxically, lower exogenous risk can make the systemic more susceptible to volatility spikes – a phenomenon we refer to as **'volatility paradox'**. *In sum, whatever the exogenous risk, it is normal for the system to sporadically enter volatile regimes away from the steady state. In fact, our results suggest that low exogenous risk environment is conducive to greater buildup of systemic risk.*

- Brunnermeier and Sannikov - AER (2014)

Shameless self-promotion

The volatility paradox is discussed in one of my (!) current papers on CBDC in a model with bank runs

- Financial frictions where bank managers have an incentive to 'do bad stuff' (i.e. stuff that bank depositors wouldn't want them to do)
- In order to dis-incentivize them from such behavior they must contribute their own net worth in funding their activities
- The banks thus fund themselves with deposits (from 'you and me') and their own net worth (accumulated from making profits over time)
- Their net worth ensures they have 'skin in the game' - by using their 'own' money, they are incentivized not to take excessive risks
- Why might they take excessive risks?
  - As equity holders with limited liability they collect on the upside and are protected against downside
  - They hold an option on the assets of the bank, with strike at the face value of debt

Incentive compatibility

For depositors to contract with the bank, they must be convinced the bank will 'do the right thing'

- This implies an 'incentive compatibility' (IC) constraint that the banks must always satisfy
- Continually ensures that reneging is less attractive for the bank than doing what the depositors want

In our model, the bank can choose to invest in safe (no variance) securities or those that exhibit volatility

- The risky asset also has lower expected payoff
- Only reason banks prefer it is the option value from limited liability
- The volatility of the bad assets varies over time

Time varying leverage constraints

'Temptation' to renege increases with volatility of 'bad' risky assets **and** in leverage

- Leverage is total assets, relative to equity
- Higher leverage, for given equity, reflects increased debt (i.e. deposit) funding
- **If volatility goes up, leverage must come down to maintain IC**

The IC manifests in state dependent leverage constraints that are tighter in riskier times

- Note that this 'leverage constraint' emerges endogenously (not by regulatory fiat)
- Capital regulation is *another* reason why bank net worth might matter - but here, it emerges from a contracting problem

Time varying leverage constraints

When volatility (or perceived volatility?) is low, a lot of leverage is permitted

- Similar predictions arise from VaR 'rules' (discussed below)
- With high leverage, comes expansion of funding to investment projects, and high asset prices
- Boom times!

But when volatility turns (like in the early stages of the GFC) the chickens come home to roost

- Funding for banks and similar intermediaries drains away (deleveraging)
- Reduces funding for the broader economy and (possibly) suppresses asset prices

Impact can be severe if no one is ready to take the place of banks in investing in firms