Discussion Of

"Intermediary Leverage Cycles and Financial Stability"

by Tobias Adrian and Nina Boyarchenko

Paul Glasserman
Columbia Business School

Day Ahead Conference
Federal Reserve Bank of Philadelphia
January 2, 2014

Overview

- An amazing paper. A *tour de force* model of the "leverage-volatility cycle"
- Some background: Adrian-Shin (2008) find that financial intermediaries increase leverage when volatility is low, pushing prices up; then cycle reverses with leverage and prices dropping and volatility increases
- This paper provides a dynamic equilibrium model that captures further compelling features of this intermediary "leverage-volatility cycle" documented empirically in a series of Adrian et al. papers, including
  - Procyclical leverage
  - Procyclical supply of credit
  - A positive price of risk associated with FI leverage

Key Features of the Model

- Two agents: households and financial intermediaries
- Two assets: productive capital and FI debt
- Two types of shocks: liquidity shocks and productivity shocks

- Households can hold both types of assets; two roles for FIs:
  - Only FIs can increase the stock of capital through investment
  - FI debt completes the market, allowing households to hedge risks

- Households choose portfolios to maximize utility of consumption paths
- FIs invest to maximize a mean-variance objective subject to a VaR constraint that ties leverage to asset volatility

- Equilibrium heroically found in closed form, and implications deduced through explicit expressions and numerical examples

Uncovering the Price of Risk for FI Leverage

- Equilibrium household consumption yields a pricing kernel with risk prices for the fundamental shocks – liquidity and productivity

- Key step: A "factor rotation" replaces the original shocks with shocks to leverage and output
- This requires two equations
  - Link between productivity and output (standard)
  - Binding VaR constraint ties leverage to asset volatility (special to model)

- Result is a pricing kernel based on shocks to output and leverage – *observable*

- Contrast: With a constant leverage constraint, only a single factor matters, liquidity risk is not priced, liquidity shocks not amplified by FI
  - Stark contrast for regulation
  - Short-cut way to read the paper: compare the two cases

A Great Paper Inspires Interesting Questions

- What type of intermediaries?
- Model of financial distress and systemic risk
- Interpretation of the liquidity shocks

What Type of Intermediaries?

- What makes these *financial* intermediaries? Couldn't they be entrepreneurs?
- What motivates leverage constraint? How does the unregulated world look?

- Link between leverage and volatility is more immediate for trading than banking
- Adrian-Shin (2008) contrasted procyclical leverage for broker-dealers with constant leverage for commercial banks;
  - A-B argue otherwise, connecting lending conditions to VIX, but empirical results are all for broker-dealers

- The distinction has implications for how "productive" the growth in FI leverage is
  - Alternative narrative: investment banks increasing leverage by re-securitizing a fixed base of real assets that changes slowly (Shin 2009)

- Possible interpretation of A-B: Effects of procyclical leverage arise *even under the most positive interpretation of the role of bank leverage*
  - But are pro-growth implications of FI leverage overstated?

Financial Distress and Systemic Risk

- The paper measures systemic risk as the probability of FI failure
- Households don't consider this risk and treat the FI debt as default-free
  - Presumably for tractability, but merits some discussion
- At FI failure,
  - FI defaults on debt, despite having positive equity
  - Value of equity goes up

  Why these choices?
- Again, more discussion would be welcome

Liquidity Shocks

- Preference shocks (stochastic time preferences) are crucial to the model
- Paper uses multiple interpretations for the preference shocks
  - Liquidity shocks
  - Time-varying risk aversion
  - Changes in beliefs
  - Preference for early resolution of uncertainty

- Liquidity shock seems to fit best with the rest of the story
  - But optimal consumption remains a fixed fraction of household wealth, regardless of preference shocks

- It would be helpful to more fully develop one interpretation

Bottom Line

- A must-read paper
- A fundamental contribution to the macro-finance literature
- My congratulations to the authors