Discussion of "A Macroeconomic Framework for Quantifying Systemic Risk"

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The views expressed here are those of the authors and do not necessarily reflect those of the Federal Reserve Bank of New York or the Federal Reserve System.

Overview

- Equilibrium model with financial intermediaries, households and productive firms
- Occasionally binding (market) equity constraint on intermediaries; entry/exit of individual intermediaries

$\Rightarrow$ Stochastic steady state distribution

- Use to study conditional systemic risk probabilities
  - Given realized shocks
  - Under alternative leverage assumptions

Comments

1. How to measure intermediary constraints?
2. Crisis probabilities

Intermediary constraints

Two concepts of leverage:

- Book: ratio of book assets to book equity
- Market: ratio of enterprise value to market equity
  - Enterprise value: book value of debt + market value of equity

Which do banks control directly?

Leverage cyclicality

	Asset Growth			Enterprise Value Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Book Leverage Growth	0.245^{***}	0.261^{***}	0.265^{***}			
Market Leverage Growth				-0.058^{***}	-0.017	-0.016
Adjusted R^2	0.105	0.194	0.191	-0.002	0.097	0.080
Observations	17443	17453	17443	17423	17433	17423
Firm FE	Yes	No	Yes	Yes	No	Yes
Time FE	No	Yes	Yes	No	Yes	Yes

- Universe: commercial banks (SIC codes 6000 – 6200), broker-dealers (SIC codes 6200 – 6300, 6712)
- Book leverage procyclical both in TS and XS
- Market leverage countercyclical in TS, no relationship in XS
- High R^2 for asset growth

Source: Adrian, Boyarchenko and Shin (2018)

Leverage cyclicality

	Asset Growth			Enterprise Value Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Book Leverage Growth	0.076**	0.102***	0.105***			
Market Leverage Growth				−0.339***	−0.259***	−0.260***
Adjusted R^2	-0.004	0.086	0.071	0.209	0.295	0.284
Observations	24818	24835	24818	24796	24813	24796
Firm FE	Yes	No	Yes	Yes	No	Yes
Time FE	No	Yes	Yes	No	Yes	Yes

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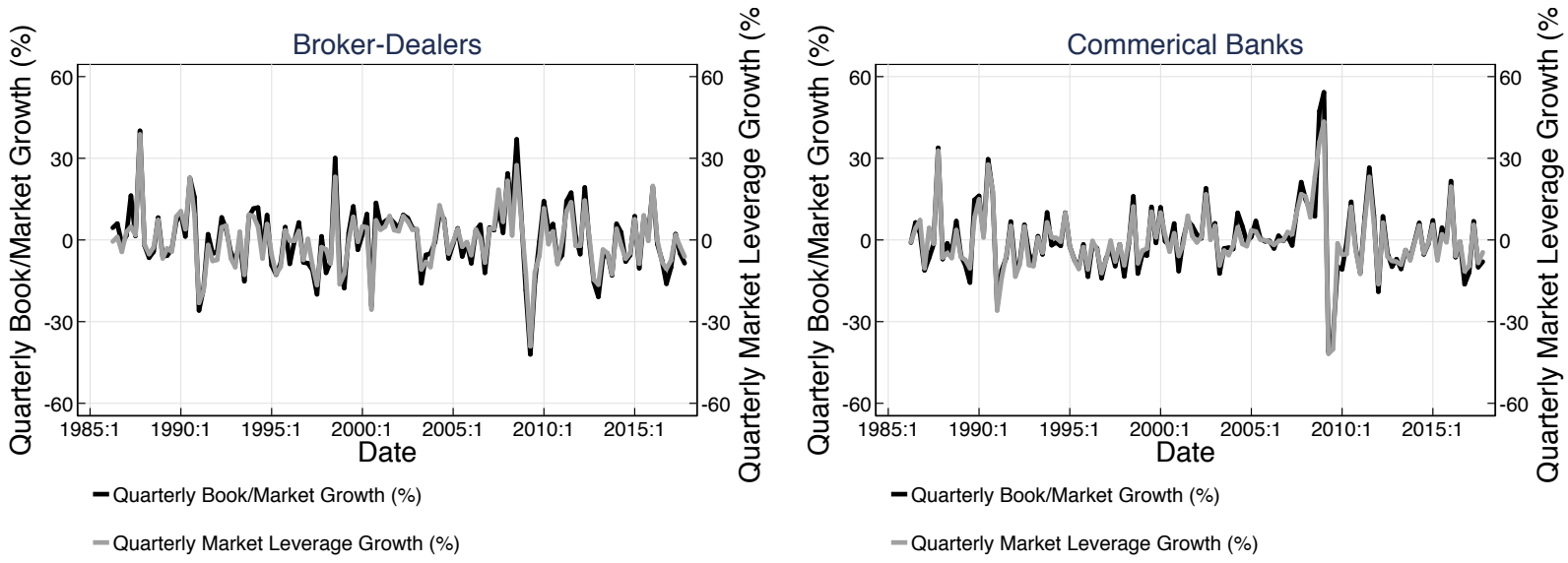
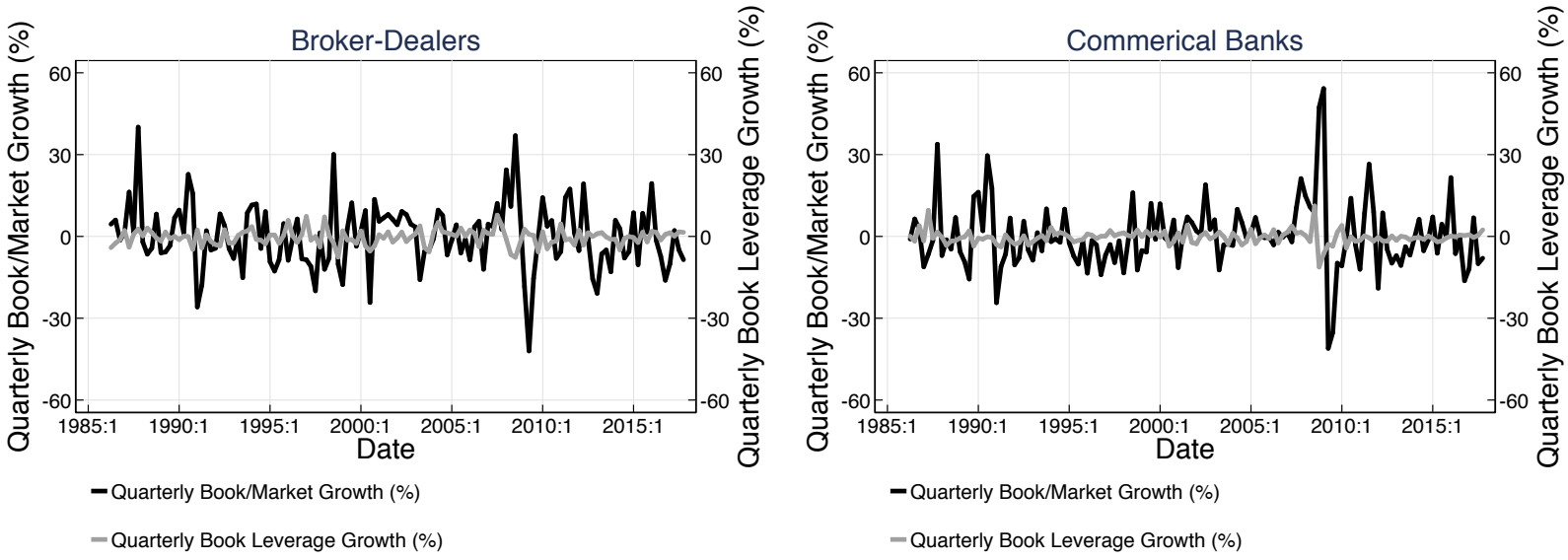
Leverage and book-to-market ratio



- Market leverage moves one-to-one with B/M ratio

Source: Adrian, Boyarchenko and Shin (2018)

Leverage and book-to-market ratio



- Market leverage moves one-to-one with B/M ratio
- Low correlation between book leverage and B/M ratio
- Not about accounting standards: broker-dealers mark-to-market; commercial banks use historical-cost accounting

Source: Adrian, Boyarchenko and Shin (2018)

Big picture

Structural model $\Rightarrow$ correctly diagnose crisis risk only if realistic transmission mechanism/state characterization

- Model-implied probability of crisis as of 2008 Q1 (at the distress boundary):
  - 3% for 1 year
  - 16% for 2 year
  - 44% for 5 year
- Paper argues low probability due to hidden leverage; if incorporate also SIV/repo leverage:
  - 10% for 1 year
  - 30% for 2 year
  - 57% for 5 year

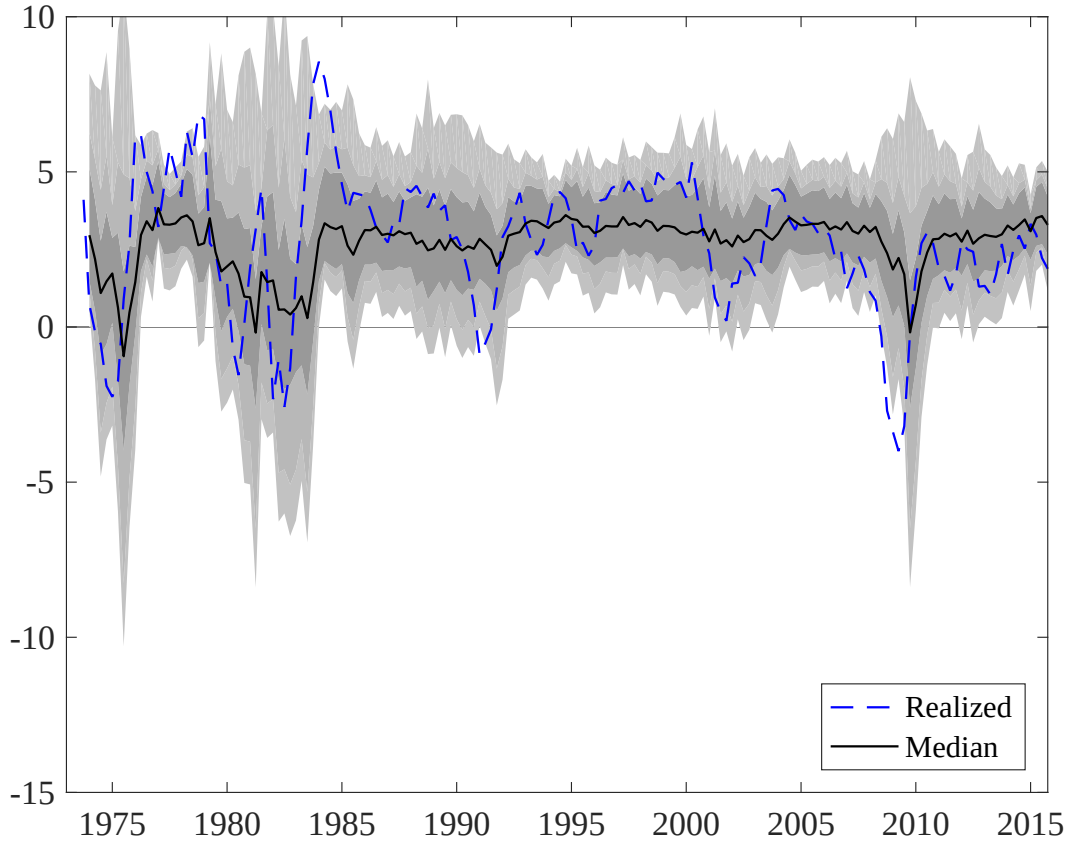
Can we do better with a non-structural approach?

Conditional distributions of growth

Adrian, Boyarchenko and Giannone (2019):

- Predict conditional distributions of GDP growth as a function of current economic and financial conditions
- Proxy for current financial conditions using Chicago Fed National Financial Conditions Index (NFCI)
  - Broad measure of financial conditions
  - First PCA of 125 series, including price, quantity and sentiment measures
- Baseline methodology: quantile regressions but also works with
  - Fully parametric GARCH model for GDP growth
  - Fully non-parametric density estimator

One year ahead distribution



Conclusion

- Structural model with bank entry/exit allows for a well-behaved stationary distribution
- Argue that can be used to study crisis probabilities under alternative scenarios
- To be used for stress testing, need to be confident that have the right link between intermediaries and real economy. Yet
  - Focus on market equity, outside of bank direct control
  - Low crisis probabilities going into 2008...reliable?