

A Macroeconomic Framework for Quantifying Systemic Risk

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Discussion by

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Comments

- Mechanism of the model & key assumptions
- Comment 1: Methodology
- Comment 2: What is “**systemic risk?**”
- Comment 3: **Matching conditional moments**
- Comment 4: **Calibration**
- Comment 5: **Amplification**

Intuition

- Mechanism

- **Reputation of specialists (“intermediaries”)** required to hold risky assets **affects asset prices (and economic activity)**
- Drop in reputation increases asset price volatility (esp. if reputation low)

- Elements

- **Intermediaries:**

- Households can invest in risky assets only through specialists
- Two types of households (**limited participation**):
 - Some households can only hold debt (“debtholders”)

- **Equity capital constraint**

- Creative & ambitious work

- Idea that capital of financial intermediaries important for economic activity very **compelling**
- Some recent work (Brunnermeier/Sannikov (2010), Gertler/Kiyotaki (2010), Rampini/Viswanathan (2011)), but not **quantitative**

Model

- **Phantom bankers**

- Bankers consume no resources
- “Our modeling of bankers appears exotic at first glance ...”
- **Ethical:** Maximize log of future “reputation” ($\propto m \times$ cumulative ret.)
- Reduces to static mean variance problem (despite equity capital constraint?)

- **Portfolio delegation problem**

- As in Ross (1973), agent (specialist) chooses portfolio
- Both principal and agent have log preferences, but η , m , and λ

- **Equity capital constraint** $E_t \leq \mathcal{E}_t$

- Similar constraint derived by He/Krishnamurthy (2011) in class of short term, affine contracts without benchmarking.

- **Boundary conditions**

- Costly entry when aggregate reputation falls below some threshold

Comment 1: Methodology

- **Continuous time differential equation approach**
 - Benefits:
 - **Global dynamics** (see also Brunnermeier/Sannikov (2010))
 - Analytical results (although here numerical solution)
 - Costs:
 - Can handle **only 1 state variable** (typically)
 - Need homogeneity of degree 1 (almost) throughout
 - Tricky issues with boundary conditions
- **“Other papers log-linearizing around a steady state ...”**
 - Not used exclusively!
 - Global methods are used where appropriate (e.g., studies of great depression or models with occasionally binding constraints)
 - Benefit: Allows inclusion of **several state variables**
 - My view: Both hammer and screwdriver useful tools depending on task

Comment 2: What is “Systemic Risk?”

- My definition:

Definition 1 (Systemic Risk). *Systemic risk is the risk that otherwise small shocks to the economy are significantly amplified and propagated by the structure of economic institutions or markets resulting in substantial and persistent aggregate real effects.*

- Aggregate effects of net worth of corporations, financial intermediaries, or households per se are not systemic risk.
- Notion of systemic risk in this paper
 - **Aggregate reputation** of financial sector matters
 - **Distress period:** times with high corporate bond spreads 33% and high volatility
 - Note: More frequent (and more mild) than recessions
 - **Systemic states:** States in which equity capital constraint binds
 - But are equilibrium dynamics very different?

Comment 3: Matching Conditional Moments

- Standard approach
 - Match unconditional moments
- **Creative approach: Match conditional moments**
 - Moreover, use model to see how economy responds to large shocks (which happen rarely)
 - Nice: Low ex ante probability of such large shocks!
 - Suggestions:
 - What does RBC model predict about “great recession” dynamics?
 - Match conditional **first moments**, too (not just second moments)

Comment 4: Calibration

- **Capital stock shocks** (exogenous forcing process): $\sigma = 5\%$
 - Large and in contrast to low volatility of the capital stock in the data
- **Land or housing?**
 - Synonyms in the paper?
 - Fixed supply (so land?)
 - Calibrated to match 40% fraction of household wealth (so housing?)
 - **Price volatility 15%** (1975-2009) (so land?)
 - Shiller data (national housing index): 7% (1988-2011) or 5% (1988-2006)
 - Aside: depreciation rate high given real estate included
- Extra **impatience** (death rate of specialists): $\eta = 13\%$
 - High impatience to get intermediaries to matter (common problem)
- Extra **non-participating households**: $\lambda = 50\%$
 - Why match intermediary leverage not aggregate leverage?

Comment 5: Amplification

- Goal: **Financial intermediation as amplification device**
- **Little macroeconomic amplification** (quantities)

- Investment only as volatile as output

	Data		Model	
	σ_x	σ_x/σ_y	σ_x	σ_x/σ_y
Consumption (c)	1.27%	0.74	3.74%	0.75
Output (y)	1.72%	1	5.00%	1
Investment (i)	8.24%	4.79	5.50%	1.10

- Investment/capital ratio almost constant
- Some **asset price amplification** (prices)
 - Price of capital “ q barely moves ... a failure of the model”
 - Price of housing volatile
 - Real interest rate drops dramatically in distress (-20%); large component of volatility of valuations?
- **Benign crises!**

Conclusion

- **Clever model** to study macroeconomic effect of financial intermediation
 - Mainly price effects with limited real effects
 - Modeling and calibration might be further improved
- Interesting attempt addressing important question