

Research Agenda for Measuring Interconnectedness

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These slides present the author's perspective on ongoing research related to the measurement of interconnectedness. The views expressed herein are solely the author's, and do not reflect those of the Federal Reserve Board or its staff. All information presented here is publicly available.

Outline

- Brief overview of near term policy initiatives that call for concrete measures of interconnectedness
- Research perspective on interconnectedness measures
- Discussion of how interconnectedness relates to other important research/policy initiatives
- Directions for future research

Near Term Policy Initiatives

- A number of specific policy initiatives require concrete measures of interconnectedness
1. FSOC determination of non-bank SIFI's
 - Proposed rule issued by FSOC 10/2011
 - Proposal states that “The Council intends to evaluate a broad group of nonbank financial companies by applying uniform quantitative thresholds representing the framework categories that are more readily quantified, namely size, **interconnectedness** ... A nonbank financial company would be subject to additional review if it meets both the size threshold and any one of the other quantitative thresholds.”
 2. Evaluation of systemic risk consequences of significant bank mergers
 - Evaluations are currently underway (CapOne and ING)
 - Evaluation will consider “a variety of metrics. These would include measures of the size of the resulting firm;.... interconnectedness of the resulting firm with the banking or financial system”

Near Term Policy Initiatives

- Interconnectedness is not simply one of many small dimensions of the problem that must be assessed. Rather it is seen as being critical to these near term initiatives.
- Consider the FSOC proposed rule on identifying non-bank SIFI's
 1. Interconnectedness is identified as one of six key elements defining a non-bank SIFI
 2. Commenters view this element as being, perhaps, the most important of the six complementary elements

“Many commenters expressed the view that interconnectedness with the broader financial system is the most important indicator of a nonbank financial company’s potential to pose a threat to U.S. financial stability.” – FSOC proposed rule

Research Perspective on IC Measures

- How should “interconnectedness” be **defined**? What is a useful working definition?
- The FSOC proposed rule provides one candidate definition

“[interconnectedness is an assessment of] the potential impact of a [non-bank financial] company’s financial distress on the broader economy”

- How does financial distress translate into a real effect (i.e. lost output) on the broader economy (i.e. both inside and outside the financial sector)
- The key issue is to think about trying to measure how financial distress leads to real negative effects on other firms, industries and sectors
- Measured against this working definition of interconnectedness how well do existing measures quantify the important elements of interconnectedness????

Research Perspectives on IC Measures

- Many extant measures of IC focus heavily on measuring the potential size of financial distress that a given firm might experience

e.g. Systemic Expected Shortfall (SES) Acharya et. al. (2010) – “each financial institution's contribution to systemic risk can be measured as its systemic expected shortfall (SES), i.e., its propensity to be undercapitalized when the system as a whole is undercapitalized. **SES increases with the institution's leverage and with its expected loss in the tail of the system's loss distribution.**”

- These types of measures are useful for measuring the size and significance of financial distress but it is **not clear how such financial distress can be mapped into outcomes for the broader economy**
 - Could the failure (near failure) of the firm be absorbed by the rest of the economy?
 - Could other competitors fill the void for the period of time that the firm is under financial stress?
 - How important are the services of the firm to the rest of the economy?

Research Perspectives on IC Measures

- Understanding how financial distress in one firm/industry/sector feeds forward through the rest of the economy is a significant research challenge
- The inter-relationships between different aspects of the financial sector and the broader economy is complex and multi-faceted.
- Consider all of the following sub-sectors of the financial sector that play a role in the broader economy
 - prime brokerage, underwriting, securities lending, clearing services, SME lending, insurance, reinsurance, asset management,...
- The linkages between these sectors and the rest of the financial sector as well as the broader economy are not well understood in a systematic and quantifiable manner
- Measures that focus on characterizing the size and significance of financial distress in these (and other) industries fall short of the mark. Ultimately, IC measures need to make a systematic and quantifiable connection to the unavoidable fallout from such financial dis-location.

Research Perspectives on IC Measures

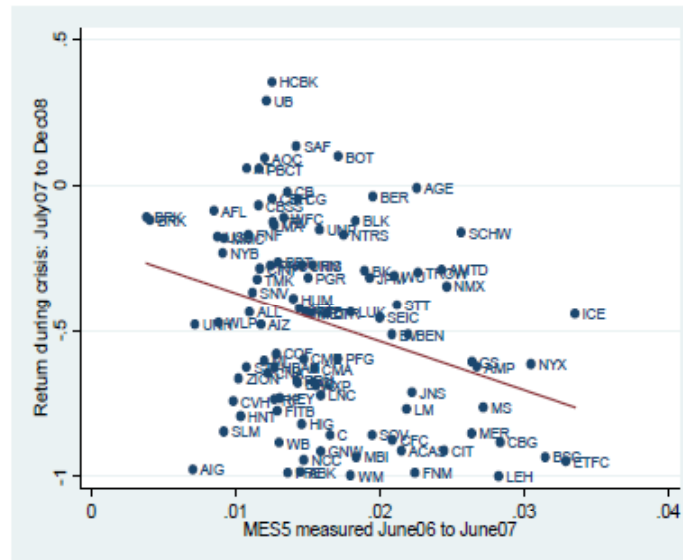
- Understanding and quantifying the degree of uncertainty around IC measures is important for having the appropriate perspective on the signal strength of any particular measure. It may also tell us which components of IC may hold more promise for measurement

MES Predicts Realized Equity Returns During the Crisis

Research Perspectives on IC Measures

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MES Predicts Realized Equity Returns During the Crisis



- Tail events are notoriously hard for anyone/thing to forecast. Other aspects of IC may be more amenable to stable and systematic quantification

Relation of Interconnectedness to Other Initiatives

- Interconnectedness is an important concept for broadening our understanding of how different aspects/sectors of the economy function together
- Understanding how different financial activities relate to the broader economy is a key part of understanding the economics of financial stability
 - How does the financial sector play a role in our understanding of the near-term evolution of the macroeconomy? (Macro Modeling - Kiley)
 - What are the feedback effects to other banks and FI's in the event that one particular financial institution is impaired? (Macroprudential Stress Tests- Lehnert)

Directions for Future Research

Modeling and measurement of interconnectedness is in its infancy. Lots of promising avenues for future research. A few that come to mind include:

- Thinking through how to quantify the real effects of financial distress across the broader economy
- What are the best measures/indicators of “connection” to other firms and sectors?
 - Credit or other services provided?
 - Number of counterparties?
 - Ease of substitution?
- Network models – a number of “first generation” network models (e.g Gai et. al. (2011)) are promising but lack realism in network dynamics.
 - What are the determinant of network formation?
 - How do networks change in the event of information or stress events?
 - What are the conditions that lead to the formation of fragile/robust networks?