All Bank Risks are Idiosyncratic, Until They Are Not:
The Case of Operational Risk

ALLEN BERGER (Univ S Carolina)
FILIPPO CURTI (Fed Richmond)
ATANAS MIHOV (Fed Richmond)
JOHN SEDUNOV (Villanova Univ)

Discussion:
ANNA CHERNOBAI

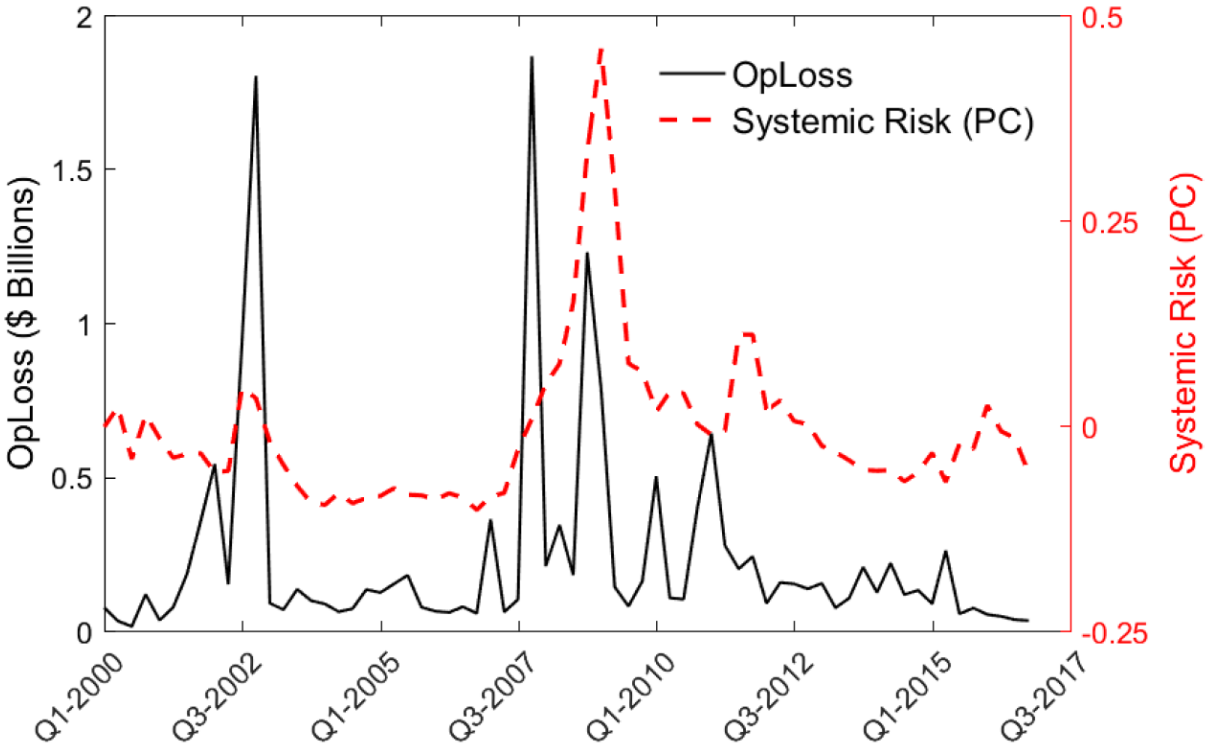
Whitman SCHOOL of MANAGEMENT
SYRACUSE UNIVERSITY

Operational Risk Research Conference
July 24, 2018
Federal Reserve Bank of Richmond, Charlotte Branch, NC

Paper summary

- **Idea: OpRisk contributes to systemic risk**

  Traditionally, OpRisk has been believed to be largely idiosyncratic to a bank.



Paper summary

- **Background: Regulatory capital requirements**

Old approach (Basel II): Advanced Measurement Approach (AMA).

- Regulatory capital is based on internal loss models.
- Risk-sensitive.
- But... Banks use different internal modeling practices. Lack of comparability of risk-weighted assets calculations across banks.

New approach (Basel III): Standardized Measurement Approach (SMA).

- Regulatory capital is an increasing function of BI Component and Loss Component.
- Different weights to different bank activities.
- Risk-sensitive (but less than AMA?). Simple. Greater comparability across banks.

Paper summary

- **Idea: OpRisk contributes to systemic risk**

  Traditionally, OpRisk has been believed to be largely idiosyncratic to a bank.

- **Background: Regulatory capital requirements**

  Old approach (Basel II): Advanced Measurement Approach (AMA).
  - Regulatory capital is based on internal loss models.
  - Risk-sensitive.
  - But... Banks use different internal modeling practices. Lack of comparability of risk-weighted assets calculations across banks.

  New approach (Basel III): Standardized Measurement Approach (SMA).
  - Regulatory capital is an increasing function of BI Component and Loss Component.
  - **Different weights** to different bank activities.
  - Risk-sensitive (but less than AMA?). Simple. Greater comparability across banks.

  The paper suggests that bank activities with **greater contribution of OpRisk to systemic risk** should be assigned **higher weights**.

Paper summary

Main findings

Biggest contributors to **systemic risk** are:

By OpRisk event type

- Internal fraud (IF, 1% *)
- Clients, Products, and Business Practices (CPBM, 78%)
- Execution, Delivery, and Process Management (EDPM, 14%)

By business line

- Retail banking (47%)
- Corporate – other (18%)

By operational loss amount/frequency

- Total amount of tail losses (>99th, 99.5th, 99.9th perc.)
- Frequency of tail events

* % all operational losses.

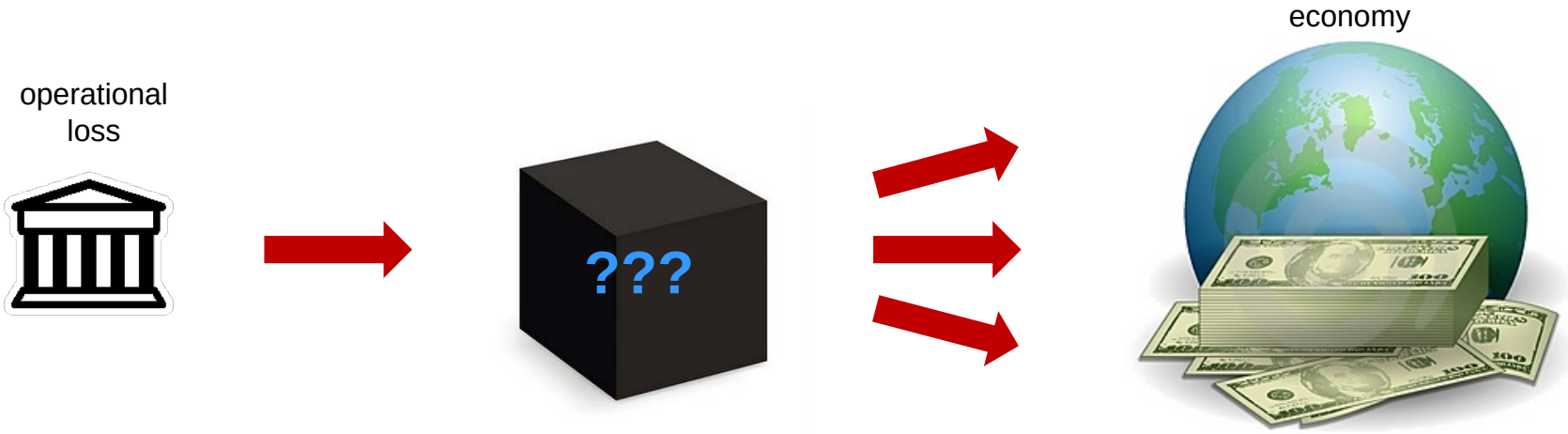
Paper summary

- I enjoyed reading the paper!
- Well written.
- Comprehensive data (2002-2016), close to 300K op. loss events.
- Great idea, big economic implications.
- Of interest to regulators in light of Basel III.

Comments

- **Motivation (1)**

What is the channel through which OpRisk contributes to systemic risk?



- From the paper: *"if idiosyncratic losses from any risk source for a large financial institution are big enough, they can pose a threat within an interconnected financial system"*

  How? Give theory / examples / empirical evidence.

- Examples in the introduction (SocGen, Barings, WF) are all examples that impact just one institution. Need better examples (e.g., 2008 fin. crisis?)

Comments

- **Motivation (2)**

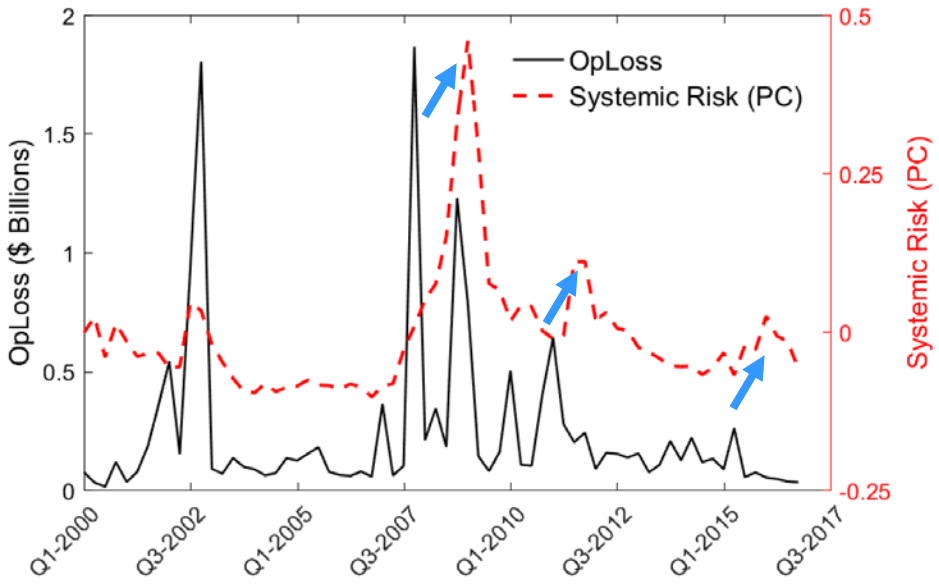
  Why would an operational loss ($$) lead to systemic risk?

  - Operational loss ($$) = direct cost of operational risk
  - But there are also indirect costs: Reputational damage, e.g., loss of market value), loss of customers, loss of personnel (e.g., CEO resignation)
  - Most banks can easily handle a multi-mln $ loss, even a bln $ loss. Most banks fail *not* because of direct material loss, but because of reputational damage (e.g., WF).
  - Suggestion: Think about measures of indirect operational loss, e.g., loss in market value or CDS spread increase around/after operational risk announcements.

Comments

- **Empirical methodology (1)**

Premise: This quarter's op. losses help predict this quarter's (?) systemic risk.



In most instances, there seems to be a several quarters' lag.

Suggestion: Include lagged op. losses in regression models. 4 lags.

Comments

- **Empirical methodology (2)**

  One key model relies on Acharya et al.'s (2017) estimate of **systemic risk**:

$$SES_{i,t} = 0.15MES_{i,t-1} + 0.04LVG_{i,t-1}$$

Acharya et al. (2017)

Use realized stock returns during crisis (2007-2009)

A bank's stock returns on market's worst 5% days before crisis (2006-2007)

A bank's leverage before crisis (2006-2007)

Comments

- **Empirical methodology (2)**

  One key model relies on Acharya et al.'s (2017) estimate of **systemic risk**:

$$SES_{i,t} = 0.15MES_{i,t-1} + 0.04LVG_{i,t-1}$$

Acharya et al. (2017)	Use realized stock returns during crisis (2007-2009)	A bank's stock returns on market's worst 5% days before crisis (2006-2007)	A bank's leverage before crisis (2006-2007)
This paper	(Do not estimate. Use coefficient estimates 0.15 and 0.04 to compute systemic risk… but over what period?)	A bank's stock returns on market's worst 5% days last quarter	A bank's leverage this quarter

Comments

- **Empirical methodology (2)**

  One key model relies on Acharya et al.'s (2017) estimate of **systemic risk**:

$$SES_{i,t} = 0.15MES_{i,t-1} + 0.04LVG_{i,t-1}$$

Acharya et al. (2017)	Use realized stock returns during crisis (2007-2009)	A bank's stock returns on market's worst 5% days before crisis (2006-2007)	A bank's leverage before crisis (2006-2007)
This paper	(Do not estimate. Use coefficient estimates 0.15 and 0.04 to compute systemic risk… but over what period?)	A bank's stock returns on market's worst 5% days last quarter	A bank's leverage this quarter

- Acharya et al. use 1 obs per bank: one before and one after crisis. This paper uses quarterly data 2002Q1 - 2016Q4. → Same coefficients won't hold.
- This paper's sample contains the financial crisis… Same coefficients won't hold.
- Acharya's sample: 102 banks >$5bln market cap. This paper: 26 BHCs >$50bln assets.
- Acharya's model included additional controls, but they are statistically insignificant, so ok, but should still include for consistency.

Suggestion: Re-estimate the model.

Comments

- **Empirical methodology (3)**

  Development of hypotheses. Section 3 lacks theoretical arguments and one-sided hypotheses.

Comments

- **Empirical methodology (3)**

  Development of hypotheses. Section 3 lacks theoretical arguments and one-sided hypotheses.

  For example,

  Hypothesis 2A: *Operational risks associated with different event types and business lines have different impacts on the systemic risk of large financial institutions, ceteris paribus.*

  - Suggestion: Need theoretical/empirical arguments why op. losses in certain ETs and BLs would contribute more to systemic risk.
  - The paper finds that *Internal Fraud* events are significantly associated with systemic risk. Unintuitive... Why?
  - The paper finds that op. losses in *Retail Banking* business line are significantly associated with systemic risk. Why?

Comments

- **Empirical methodology (4)**

  Timing.

  1. Occurrence date.
  2. Discovery date.
  3. Accounting date. = The first date financial impact is recorded or legal reserves for future losses are estimated.

  There are also:

  4. Public announcement date.
  5. Settlement date.

Comments

- **Empirical methodology (4)**

  Timing.

  1. Occurrence date.
  2. Discovery date.
  3. Accounting date. = The first date financial impact is recorded or legal reserves for future losses are estimated.

  There are also:

  4. Public announcement date.
  5. Settlement date.

  - Concerns:
    - Authors aggregate all losses from the same event at accounting date. Suggestion: Treat them as separate losses to avoid look-ahead bias?
    - Is it possible to accurately estimate future financial impact around or prior to financial crisis? How close is your estimation vs. true realized loss?

Comments

Other

- Acharya et al. (2017) also examined systemic risk in the CDS market.
- Implicit government guarantees. What's the effect on systemic risk?
- Are your estimates economically significant?

  "A 10% increase in operational losses is associated with a 0.0067 increase in Systemic Risk or 0.048 standard deviations."

  "A one standard deviation increase in Ln(OpLoss) is associated with 0.14 standard deviations increase in Systemic Risk."
- To define 'tail events,' you use 99th, 99.5th, and 99.9th percentiles. Why? Can use Extreme Value Theory.
- Risk Management Index is used as a control variable. Endogeneity?
- Distance-to-default and its interaction with op. loss may be problematic. Endogeneity. Perhaps, it's not DD that is amplifying the effect of op. losses on systemic risk, but a 3rd variable that's driving both DD and op. losses.
- Choice of IV variables in robustness tests is unclear. It seems that all 3 are directly related to systemic risk.
- Would greater regulatory capital for op. risk reduce systemic risk?

Thank you for your attention!

Comments or questions:

annac@syr.edu

EXTRA

Operational risk event types

ET1: Internal Fraud

– unauthorized activity, theft & fraud involving at least 1 internal party

ET2: External Fraud

– theft & fraud by a 3rd party, systems security

ET3: Employment Practices and Workplace Safety

- discrimination, general liability, compensation

ET4: Clients, Products, and Business Practices

– improper business & market practices, model errors

ET5: Damage to Physical Assets

– natural and man-made disasters, vandalism

ET6: Business Disruption and Systems Failures

– hardware & software failures, telecommunications

ET7: Execution, Delivery, and Process Management

– data entry error, missed deadline, delivery failure