

SYSTEMIC RISK ANALYTICS

A FEW INPUTS

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Purposes

- ① Describe the biggest source of systemic financial risk.
- ② Discuss ways to incorporate information on this source into AI analytical methods for detecting systemic risk.

Biggest source of systemic risk

Executives incentivized to take excessive risk

Definition of excessive risk

- Excessive risk implies risk greater than that selected by a financial institution with no distortions created by limited liability, TBTF, compensation schemes, poor corporate governance, etc.
- Excessive risk is not just about moving along the efficient risk-return frontier; It is about increasing risk even if this does not increase the expected returns to the financial institution.

What incentivizes excessive risk?

- Classic risk-shifting

- Limited liability and informational asymmetries create risk-shifting incentives: Equity holders borrow promising to keep risk low and “shift” to higher risk projects.

- Executive compensation

- Executives are often paid with an option-like contract: This payout structure incentivizes risk-taking.

What will constrain incentives for excessive risk-taking?

Executives often incentivized to take excessive risks.



- Bondholders.
- Large, highly-exposed owners.

What will constrain incentives for excessive risk-taking?

Executives often incentivized to take excessive risks.



- With TBTF, bondholders often don't constrain risk.
- There are no influential, highly-exposed owners.

So, what will constrain excessive risk-taking?

Will capital regulations?

Bank	
Assets	Liabilities
Riskier Assets	Debt
Safer Assets	Equity

Undistorted balance sheet:

- Limited liability, TBTF, ineffective corporate governance, etc. do not distort incentives

Bank	
Assets	Liabilities
Riskier Assets	Debt
Safer Assets	Equity

Distorted balance sheet:

- Incentives distorted by limited liability, TBTF, ineffective corporate governance, etc.
- Bankruptcy risk rises.

Will capital regulations constrain excessive risk-taking?

Bank			
Assets		Liabilities	
Riskier Assets	↑	Debt	↓
Safer Assets	↓	Equity	↑

Distorted balance sheet + Capital regulations


- Incentives distorted.
- Increase in equity financing reduces bankruptcy risk



➤ The increase in capital reduce the probability of bankruptcy: This is a classic argument for capital regulations.

➤ But this argument misses a key point.

The key point:

Executives still choose excessive risk.

- Even with increased bank capital, executives still typically have incentives to increase risk ... perhaps even stronger incentives.
- Society makes excessively risky investments: Systemic risk 

Bank	
Assets	Liabilities
Riskier Assets 	
Safer Assets 	Equity

Distorted balance sheet + 100% capital regulations !!

- Incentives distorted.
- No risk to debtholders

The key point:

The additional equity does not typically come from executives or influential owners.

- **Even with increased bank capital, executives still have incentives to increase risk ... perhaps stronger incentives.**
- Society still allocates too much to excessively risk endeavors.
- This *is* systemic risk, even if banks never default.

Bank	
Assets	Liabilities
Riskier Assets	↑
Safer Assets	↓
	Equity

**Distorted balance sheet +
100% capital regulations !!**

- Incentives distorted.
- No risk to debtholders

My argument so far

- Executives are incentivized to take excessive risks.
 - Reflects compensation schemes, TBTF, limited liability, ownership structure, and corporate governance of banks.
- Excessive risk means savings are allocated inefficiently
 - Too much of society's savings flow to high risk endeavors without compensating social returns.
- Capital regulations do not deter excessive risk taking
 - The economic system becomes too risky: Systemic risk rises.
 - Savings are mis-allocated
- So, what other things can countries do?

What can authorities do?

- ① Make financial institutions highly regulated utilities:
 - Massive regulatory and supervisory involvement in all elements of the financial system.
 - Likely result of this approach
 - Constrain risk-taking.
 - Curtail growth relative to some policy options
 - “Continental European approach”

What can authorities do?

② Pseudo-markets approach

- Stress benefits of getting rid of TBTF, but without providing a credible means of eliminating TBTF.
- Stress power of markets, without recognizing that the market will not correct policy-created incentives for excessive risk-taking.

➤ Likely result: Crisis

➤ “US approach”

What can authorities do?

③ Focus on incentives of decision makers

- Reject the regulated utility model as growth-retarding
- Reject the pseudo-markets model as reckless
- Stress incentives
 - Force decision makers to have skin-in-the-game.
 - Compensation schemes / ownership structure are strategies.
- Results: Constrained risk-taking and more growth.
- “Wishful thinking approach”
 - Decision makers do not like this approach

Purposes

- ① Describe the biggest source of systemic financial risk. ✓
 - Compensation schemes of decision makers
 - Lack of skin-in-the-game by decision makers
 - TBTF, limited liability, regulatory disregard of incentives
 - Excessive risk
- ② Discuss ways to augment AI methods for detecting system risk.

AI can help detect systemic risk

- Obtain **Non**conventional Data
 - Compensation schemes.
 - Wealth exposure of decision makers.
 - De jure and de facto regulatory and supervisory policies.
- Incorporate these data into statistical learning models
 - Predict risk of individual institutions.
 - Predict contribution to systemic risk by individual institutions.
 - Measure sources of international systemic risk.



That's all Folks!