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Systemic risk and financial regulations: what is the link?

Conference Presentation

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Systemic risk and financial regulations: What is the link?

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The Systemic Risk Centre

www.systemicrisk.ac.uk

- Funded by the Economic and Social Science Research Council (ESRC) with a budget of £5 million for five years
- Hosted at the London School of Economics
- Formal relationship with a number of public institutions
- Multidisciplinary
  1. economics/finance
  2. law
  3. political science
  4. computer science
The True Nature of Risk
The problem with risk

• For at least 800 years the authorities have tried to contain risk taking in the financial system
• And often failed
• The surgical tools we want don’t work and the blunt tools kill the patient
• Why is it so difficult to regulate risk taking
• To me, the answer lies in the nature of risk
What is risk?
Systemic risk
MacroPru
Regulations
Conclusion
**Endogenous risks vs. Exogenous risks**

- **Endogenous risk**: the risk from shocks that are generated and amplified *within* the financial system.
- **Exogenous risk**: shocks that arrive from *outside* the financial system.

**Analogies**
- a financial hedge (futures contract) vs. a weather hedge (umbrella)
- poker vs. roulette

**Essentially situations where a person affects outcomes vs. situations where the agent cannot**
Millennium Bridge

- First new Thames crossing for over a hundred years
  - new design, extensive tests, riskless
  - opened by the queen on June 10th 2000
- What happened?
  - Wobbled violently within moments of bridge opening
  - Remain closed for the next 18 months
Millennium Bridge

- New design
- Tested with extensive simulations
- All angles covered
- No endogenous shocks
- Riskless
What Endogeneity?

- Pedestrians had some problems
- Bridge closed
What happened?

- Took the engineers some time to discover what happened
What went wrong?

- An engineering answer
  - cause: horizontal vibrations at 1 hertz
  - walking pace: 2 steps per second, i.e. 2 hertz
  - producing 1 hertz horizontal force
- Why should it matter?
  - peoples’ swaying to the left and right cancel out each other
  - only a problem when people walked in step
  - probability of a thousand people walking at random ending up walking exactly in step? — close to zero
- If individual steps are independent events, but...
Given feedback...near certainty!

Bridge moves
Given feedback...near certainty!

Bridge moves

Adjust stance
Given feedback...near certainty!

- Adjust stance
- Bridge moves
- Push bridge
Given feedback...near certainty!

1. Adjust stance
2. Push bridge
3. Further adjust stance
4. Bridge moves

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Given feedback...near certainty!
Actual and Perceived Risk
Butterflies and hurricanes

- Chaos theorists talk about how a butterfly in Hong Kong can cause a hurricane in the Caribbean.
- What is important is the *mechanism* allowing this to happen.
- The trigger (the butterfly) is incidental.
- And the hurricane the unfortunate outcome.
- Focus of study and policy should be the mechanism.
When risk is created

“The received wisdom is that risk increases in recessions and falls in booms. In contrast, it may be more helpful to think of risk as increasing during upswings, as financial imbalances build up, and materialising in recessions.”

Andrew Crockett, then head of the BIS, 2000

• Consistent with Minsky’s financial instability hypothesis
Two faces of risk

• When risk is endogenous — as it always is — individuals observe *and* react to it, thus affecting their operating environment

• *The financial system is not invariant under observation*

• We cycle between virtuous and vicious feedbacks
  • the risk that is reported by most risk forecast models — *perceived risk*
  • whilst the *actual risk* is hidden and ever present
What is risk?
Systemic risk
MacroPru
Regulations
Conclusion

Endogenous bubble

Prices

Graph showing the growth and subsequent collapse of prices in an endogenous bubble.
Endogenous bubble

Prices

Perceived risk
Endogenous bubble

Prices
Perceived risk
Actual risk
The lessons are...

- Risk is created *out of sight* in a way that is *not detectable*
- Attempts to measure risk — especially extreme risk — are likely to fail
Systemic Risk
So what is it?

• Surprisingly poorly defined
  
    1. The lack of clarity is manifested by the heterogeneity of the applications

• Different commentators see it as an event with a wide range of severity probabilities and implications
  
    • end of the world scenario
      
    or

    • typical financial crisis and even just turmoil

• Policy response depends on one’s notion of systemic risk

• Gives breathing space for a lot of poor work
High level view

IMF, BIS and FSB (2009)

“the disruption to the flow of financial services that is (i) caused by an impairment of all or parts of the financial system; and (ii) has the potential to have serious negative consequences for the real economy.”
"Systemic crises" in OECD countries from 1970 – 2011 from the IMF systemic crises database

<table>
<thead>
<tr>
<th>crises</th>
<th>#</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>Australia, Canada, New Zealand</td>
</tr>
<tr>
<td>1</td>
<td>23</td>
<td>Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Netherlands, Norway, Poland, Portugal, Slovak Republic, Switzerland,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>United Kingdom</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>Chile, Hungary, Mexico, Slovenia, Spain, Sweden, Turkey, United States</td>
</tr>
</tbody>
</table>
Summary stats

- Weighted by year of joining OECD
- Unconditional probability of a crisis is 2.33% a year, or once every 43 years
- This suggests that target probabilities should be set to
  - $p = 0.023$ annual
  - $p = 9 \times 10^{-5}$ daily
- If anything an overestimate
- Time between Great Depression and 2007 was 78 years
Statistical regularities in crisis

- Many — even most — statistical models aiming to help us to understand systemic risk
- Make strong assumptions about how *history repeats itself statistically*
- But the empirical evidence suggests this is not true
• Little statistical regularity in crises
  • volatility may fall or increase
  • tails may be thicker or thinner
  • etc.
• Statistical modeling of crises does not seem to deliver very much
• A logical conclusion of the earlier endogenous risk analysis
Has systemic risk been increasing?

- The empirical evidence does not indicate so
  1. the only way to answer such a question is by analysis over a very long time period — centuries
  2. after all, crises only happen once every 42 years, or less, and one needs multiple crises to answer the question
  3. on such a timescale, if anything, the frequency and severity of systemic crises has been falling
- So answer is no
The various factors contributing to systemic risk

- Risk–taking *out of sight* (has always been there)
  1. complexity and mathematization of finance is a key enabler
- The *legal system* (this is relatively new)
  - the increased complexity of financial contracts
  - the provinciality of the legal system
- The *political system* (has always been there)
  - a key factor in undermining financial regulations
  - and macro prudential policy
  - whilst championing certain banks (preference for TBTF)
- *Finance has no borders, policymakers do*
MacroPrudential Regulations
or MacroPru
What is it?
BIS, FSB and IMF in 2009

- Policies that use macroprudential tools to limit systemic risk, arising from:
  1. asset price booms that may be accompanied by credit booms and excessive leverage in non-financial and financial sectors
  2. the ability to lend is facilitated by access to wholesale funding
  3. during failures, even solid and liquid institutions are likely to sharply curtail lending, both to reduce risk and to build up liquidity buffers
- One might say this is very 2007
Objectives of MacroPru

as stated by IMF, which does not want macropru to be overburdened by other objectives

1. Curtail excess leverage and excess reliance on short-term wholesale funding to stop credit expansion supporting high asset prices

2. Address the problem of too big to fail

3. Increase resilience by building up buffers that can be used in downturns

- These objectives are now being expanded, for example as stated by the Bank of England
Tools
the Committee on the Global Financial System (2012)

1. Capital–based instruments
   • for example, countercyclical capital buffers, dynamic provisions and sectorial capital requirements

2. Liquidity–based instruments
   • like countercyclical liquidity requirements, margin and haircuts, as well as a limit on liquidity and FX mismatches

3. Asset–side instruments
   • this includes maximum LTV and DTI ratios
The frontier

- At a state-of-the-art research aims to incorporate the financial sector into typical money-macro models
  - the academic approach is somewhat different than the central banking approach
- Typical central bank dynamic stochastic general equilibrium (DSGE) models are being augmented
- Generating financial regulation/MacroPru conclusions
Bank of England
speech by Andy Haldane October 2013
Simulating Macro-prudential Policy
Which is the most likely GDP over a century

GDP 3% growth
Which is the most likely GDP over a century

- 4% growth
- 3% growth
Which is the most likely
GDP over a century

4% growth
3% growth
Which is the most likely

GDP over a century

- 4% growth
- 3% growth
- 2% growth
Can macroprudential regulation be used to dampen the procyclicality of banks, shadow banks and the financial system at large?
Impact of macropru

- A successful macropru policy leads to a period of stability
- Causing market participants to extrapolate that
- And thereby increasing risk
- In a way that is undetected until too late
- So the *stability is destabilizing*
- Minsky moments
  - financial institutions have a tendency to extrapolate stability into infinity, investing in ever more risky debt structures, followed by an abrupt correction
Forest fires in the US

- Forest fires are endemic in the Southwest US
- Historically, they would flare every few years, burn the undergrowth, but spare the big trees
- Fires were frequent and small
- Then people moved into forests — all fires fought
- Successful for a generation
- Then when a fire starts, there is so much dry undergrowth that fire becomes out of control and burns the big trees
- The US fire authorities opted for what was in effect lowering volatility and fattening the tails
Will it work?

- He argues that if the authorities implement restrictions on credit expansion, (like LTV and DTI), disintermediation ensues.
  - Mortgages may end up being provided by non-banking firms, showing that in New Zealand such policies led to over 40% of mortgages being intermediated by lawyers sitting between capital owners and borrowers.
- Disintermediation can cause the authorities to lose control.
- (We are seeing this in southern Europe in a different context.)
Can macroprudential regulation be used to dampen the procyclicality of banks, shadow banks and the financial system at large?
I am skeptical because

- The tools to measure the state of the economy are either highly inaccurate or significantly lag
- It will be difficult to get the political support to implement the necessary tools
- It will be difficult to achieve the necessary international coordination
- A successful macropru policy is endogenously undermined — Minsky
- Useful to consider those macropru tools that have been historically successful
Regulations
Fact and myth

- Over time the intensity of financial regulations has varied.
- But there is little evidence that the amount of regulations has increased or decreased in the long run.
- Regulations however have changed form:
  - A few decades ago broad activity restrictions but hands–off otherwise.
  - More recently, broad restrictions abolished, but close monitoring and control of individual activities.
  - Today, there is more regulatory activism since at least the 1930s (and then only in the US). On a global scale this is unprecedented.
- Will this deliver as promised?
The promises

• On the highest level, the political objectives seem to be along the following lines

  “The financial system is dangerous. Let’s do something about it”

• Closer to the ground, one might read something about a reduction in systemic risk or efficiency

• Closer to the implementation level, it is very hard to find succinct official policy objective stated

• This makes it hard to evaluate the effectiveness of regulatory initiatives, since one cannot test them against an objective
Problem

- Financial regulations transfer responsibility from the financial institutions to the government
- Financial institutions have an incentive to maximize this transfer of responsibilities
- Meanwhile, they have direct financial interests in bypassing and undermining any regulations
- While at the same time, they prefer expensive, complex and difficult to implement regulations
- They are highly effective lobbyists, whether via the political process or the regulatory process
Regulations and risk

- Some regulations directly reduce systemic and endogenous risk
  - limits on buying stocks on margin, DTI
- But most regulations simultaneously increase and decrease such risk (like Basel III/CRD)
  - they are increasingly procyclical (from Basel I to Basel III)
- Impact of constraints (next slide)
The financial system is replete with external constraints
- margins, mark to market, leverage, risk, etc.
- While all of these are effective in giving protection they also have a dark side
Endogenous crisis

Capital, but could have been any of the constraints
Endogenous crisis

Capital, but could have been any of the constraints

Capital constraint binds

Exogenous shock
Endogenous crisis

Capital, but could have been any of the constraints

- Deleveraging
  - Sell risky assets

- Capital constraint binds

- Exogenous shock
Endogenous crisis

Capital, but could have been any of the constraints

- Capital constraint binds
- Deleveraging
  - Sell risky assets
- Prices fall

Exogenous shock
Endogenous crisis
Capital, but could have been any of the constraints

- Exogenous shock
- Capital constraint binds
- Distress
- Prices fall
- Deleveraging
  - Sell risky assets
Can structural bank reforms be useful to reduce/curtail systemic risk?

- Short answer: *yes*. Long answer: *it depends*. Do they
  - effectively target clear drivers of systemic risk without just shifting undesirable activity to other parts of the system or other jurisdictions?
  - effectively interact with other parts of the overall regulatory agenda?
  - just transfer responsibility to the state?
  - let financial institutions appear to comply without actually doing so?
  - lead to financial engineering?
  - have a sound economic logic or are they politically driven?
  - allow the authorities can appear to be doing something without actually doing anything?
Are there are unintended consequences of the latest batch of regulatory reforms?

- There are always unintended consequences
- A technical example is the market risk regulations and how they can lead to less robust risk forecasting than the previous regime
- But let me focus on the fallacy of composition (next slide)
Fallacy of composition

- Focus on the institution and not the system
- Suppose every institution is prudently run — the objective of the regulations
- And a shock hits the system — say negative price shock
  - this automatically will increase perceived risk
- Because everybody is prudent nobody can buy the assets whose price fell because their perceived risk increased
- And even worse, in order to to remain compliant, banks will have to get rid of those assets
- Creating a negative feedback loop
If and how revisions of Basel III have reduced the scope for systemic risk

- Two things stand out as effective
  1. the move towards core equity
  2. the dual requirement of the leverage ratio
- The 2 drawdown buffers don’t seem all that useful
- The GSIB buffer is a poor solution to the TBTF problem and may be worse than nothing
- I have doubts about the LCR and an NSFR
Systemic risk and financial regulation: what is the link?
Financial regulations and systemic risk directly impact each other

- Regulations can decrease systemic risk and they can increase it
- Regulations can create endogenous risk feedback loops
- They can drive risk out of the authorities radar
- They can stabilize the system and hence encourage risk–taking
- And transfer responsibility to the state, which also encourages risk–taking
- Or effectively prevent undesirable activities
1. Regulations effective in ensuring sustainable and low volatility economic growth
2. Continued prosperity and lack of crisis will undermine the political support for regulations
3. A new crisis will show all of the current efforts to be ineffective leading to very radical reform
The authorities are now involved in every aspect of the financial system,
- from risk management to asset allocation, personnel decisions, compensation, marketing, resolution, funding and bailouts, meanwhile aiming to allocate aggregate credit over sectors and cycles
- If the authorities are so good, the logical conclusion is to nationalize the financial system and let the government run it all
- If that is not desirable, where are the boundaries between banking and regulation?