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Systemic risk and financial regulations: what is the link?

Conference Presentation

Original citation:

Originally presented at *European Commission (Economic Analysis), Internal Market and Services DG Conference*, 27 February 2014, European Commission, Brussels, Belgium.

This version available at: <http://eprints.lse.ac.uk/57375/>

Available in LSE Research Online: July 2014

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Based at the [London School of Economics and Political Science \(LSE\)](#), the Systemic Risk Centre is generously funded by the [Economic and Social Research Council](#) [Grant no. [ES/K002309/1](#)]

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Systemic risk and financial regulations: What is the link?

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February 27, 2014

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- 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

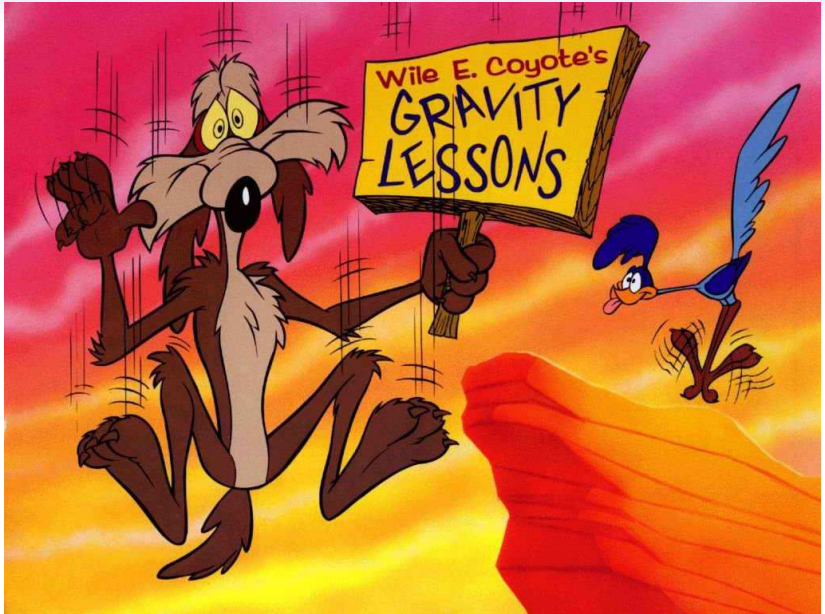
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Regulations

○○○○○○○○○○○

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

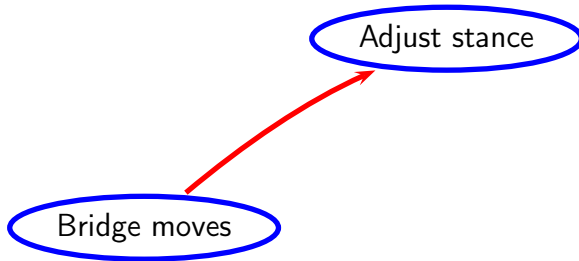
What went wrong?

- An engineering answer
 - cause: horizontal vibrations at 1 hertz
 - walking pace: 2 steps per second, i.e. 2hertz
 - 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...

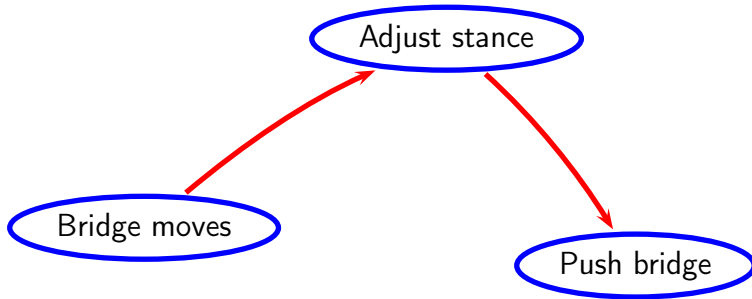
Given feedback...near certainty!

Bridge moves

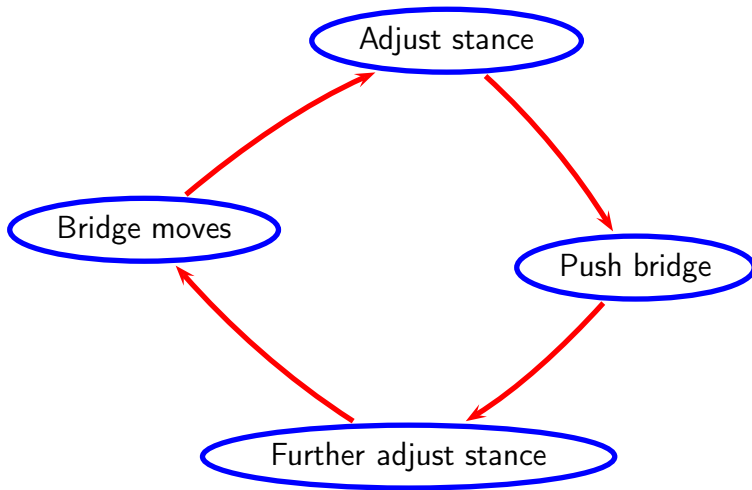
Given feedback...near certainty!



Given feedback...near certainty!



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.”

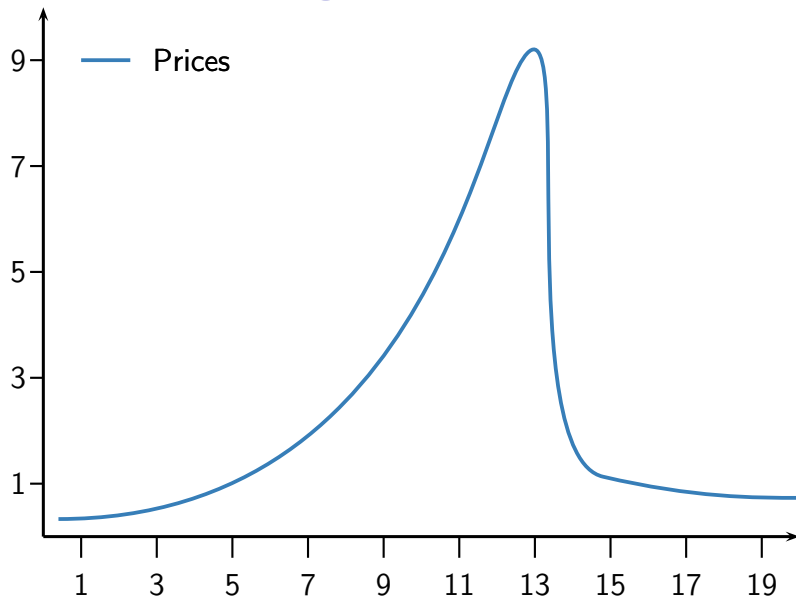
Andrew Crockett, then head of the BIS, 2000

- Consistent with Minsky's financial instability hypothesis

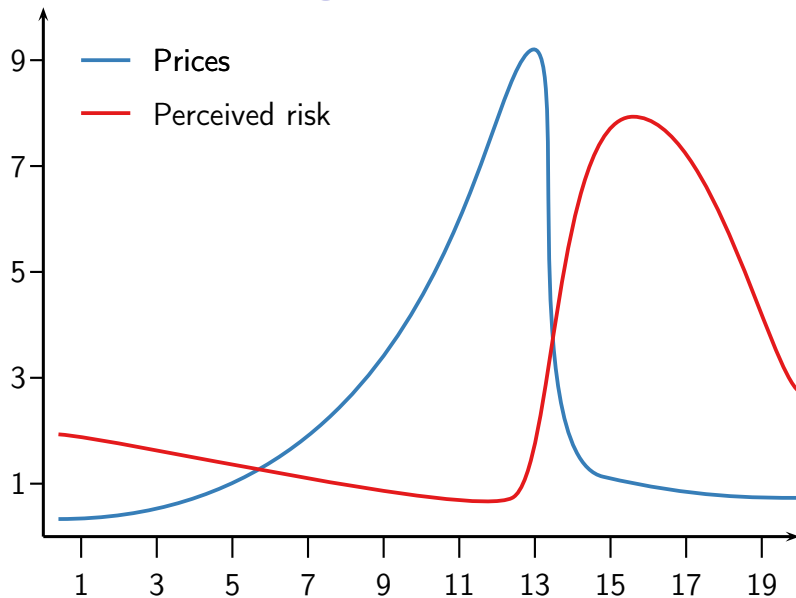
Two faces of risk

- 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

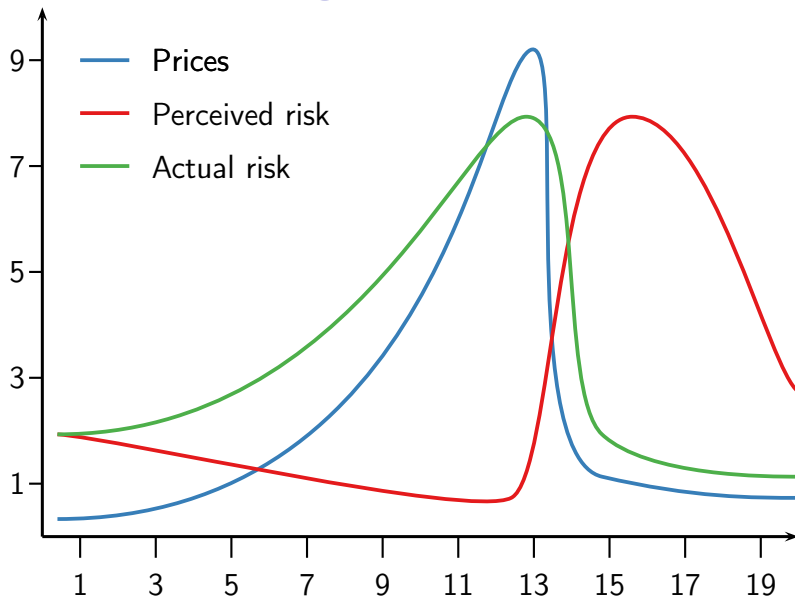
Endogenous bubble



Endogenous bubble



Endogenous bubble



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

crises #

0	3	Australia, Canada, New Zealand
1	23	Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Switzerland, United Kingdom
2	8	Chile, Hungary, Mexico, Slovenia, Spain, Sweden, Turkey, United States

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 a 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

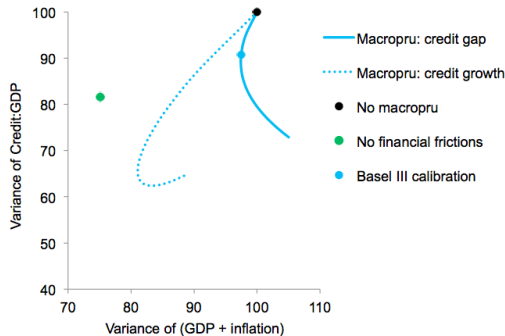
The frontier

- Atate-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

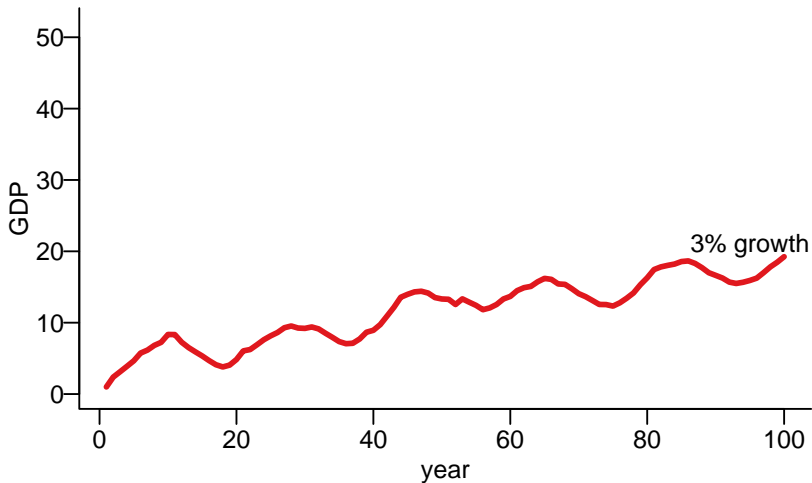
Bank of England

speech by Andy Haldane October 2013

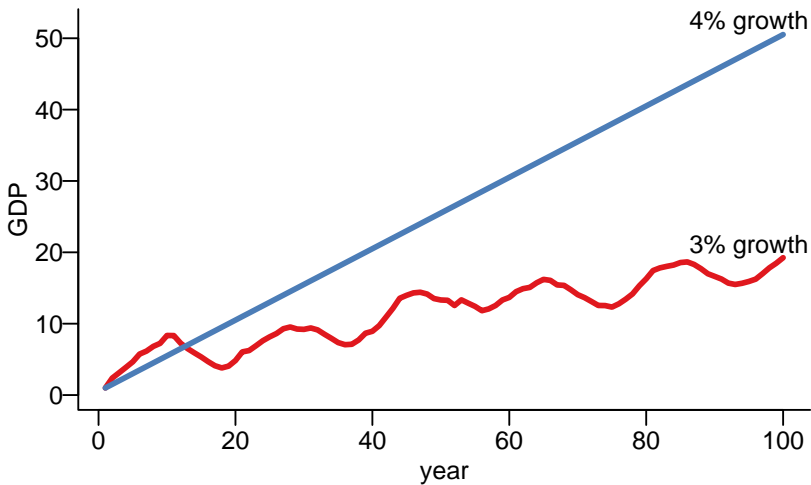
Simulating Macro-prudential Policy



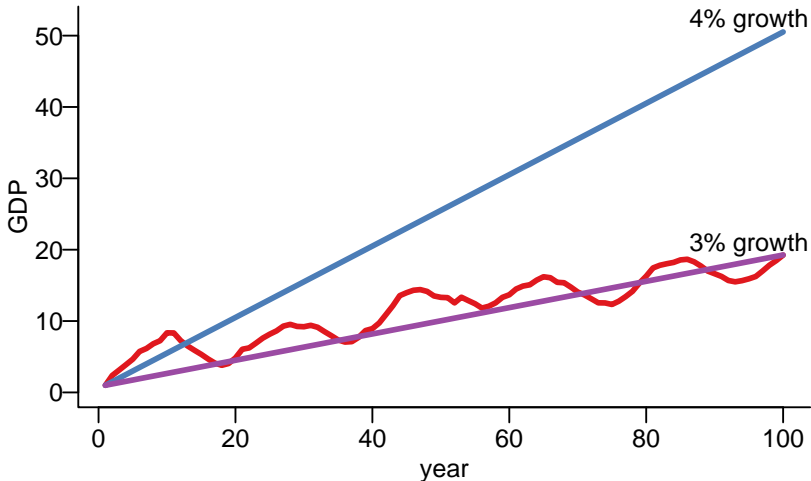
Which is the most likely GDP over a century



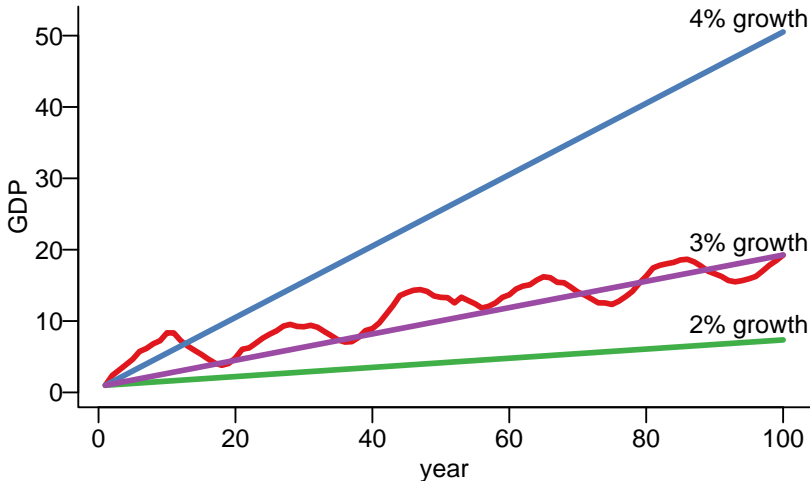
Which is the most likely GDP over a century



Which is the most likely GDP over a century



Which is the most likely GDP over a century



So...

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?

- Arthur Grimes (2013) focuses on real estate
- 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)

Back to the question

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 surprise of constraints

- 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

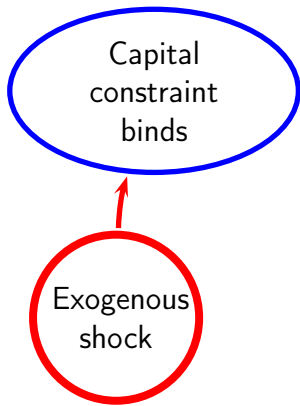
Endogenous crisis

Capital, but could have been any of the constraints



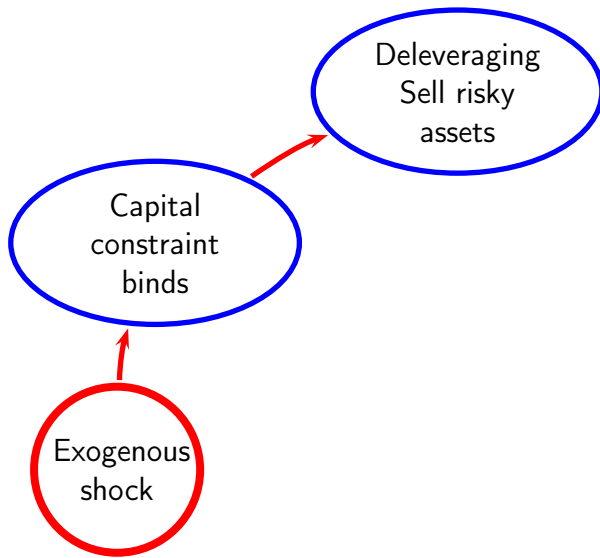
Endogenous crisis

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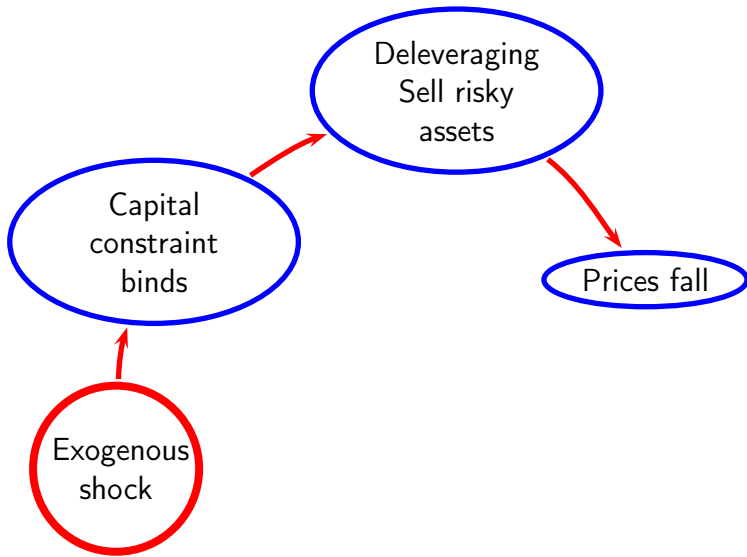
Endogenous crisis

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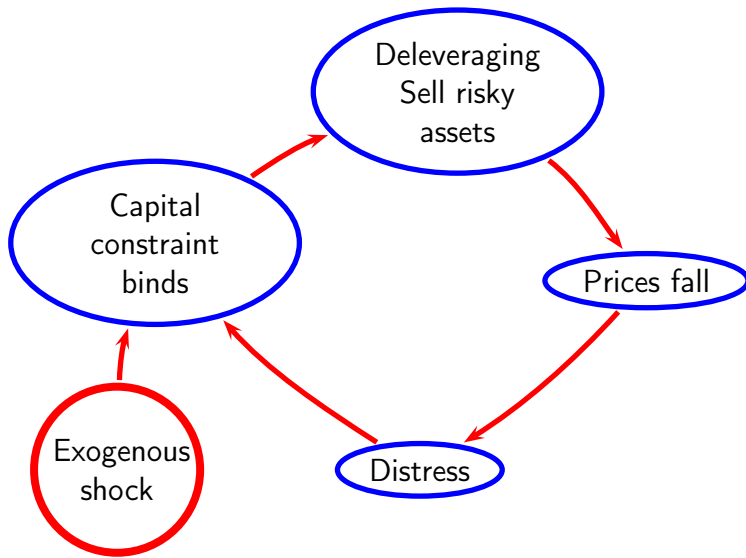
Endogenous crisis

Capital, but could have been any of the constraints



Endogenous crisis

Capital, but could have been any of the constraints



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

Scenarios

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

Finance and society

- 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?