## Systemic Risk

### Origins

1914

### Structure

SIFIs

### Covid-19

Policy

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# Global Financial Systems

## Chapter 1

### Systemic Risk

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To accompany

*Global Financial Systems: Stability and Risk*

http://www.globalfinancialsystems.org/

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Book and slides

- The tables and graphs are the same as in the book
- See the book for references to original data sources
- Updated versions of the slides can be downloaded from the book web page www.globalfinancialsystems.org
The financial system

- The role of the financial system is to allocate resources efficiently
  1. make productive investments
  2. allow us to save
- The financial system affects most aspects of society, including economic growth, economic opportunities, inequality and poverty
- Historically has been the most regulated part of the economy
  1. crises
  2. ensure it efficiently does what it is supposed to, and nothing more
  3. financing the sovereign
Good, bad, evil?
what do the various constituencies say?

A. Financial markets are only casinos for the rich
   • they don’t much affect savings, investments and innovation
   • regulate then very heavily

B. The financial system plays an important role in the efficient allocation of resources
   • “The banker authorizes the entrepreneur in the name of society to innovate.” Schumpeter (1912)
   • regulate with a view to reduce damage (crises, abuse)
   • but don’t get too much in the way of how the system functions
Bank assets to GDP

the US should surprise you
Why is the US so low?

- In every country, except US, almost all financial intermediation is via banks
  - 84% in UK, 92% in Germany, 96% in Spain. Same in Asia and Latin America
- In the US it is 34%
- Where there are a number of alternative ways to do financial intermediation
- Makes the US much more resilient and is a key reason why it recovered so well from 2008
- It now has much stronger banks than Europe
Systemic risk
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The regulation pendulum

Growth

Stability

Financial stability
Economic growth

Intensity of regulations

2007
2019
2021

low
high
Systemic risk

- Systemic risk is the possibility of a serious financial crisis causing a deep economic recession
- It is connected to financial stability
- The theme of the chapter is that systemic risk is generally created out of sight
- And we have to find the deep (and hidden) mechanisms of the financial system to understand it
- The *hidden amplification mechanisms* is what matters the most
What drives risk?

• The 2008 crisis happened because of decisions made years earlier
• In 2003 all the signs pointed to risk being low
• The authorities and the private sector thought we were safe
• And so it was perfectly OK to take extra risk
• But
• “Stability is destabilizing” (Minsky)
The unknown unknowns
thanks to Donald Rumsfeld

- The US stock market goes down by $200 billion in one day and nobody cares
- Potential subprime losses of less than $200 billion, and OMG, its the end of civilization
- The risk we know we prepare for — *known unknowns*
- The risk we don’t know is the dangerous type
- The *unknown unknowns* are most damaging
Risk is endogenous


- Risk is exogenous or endogenous
  - exogenous  Shocks to the financial system arrive from outside the system, like with an asteroid
  - endogenous  Financial risk is created by the interaction of market participants

“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
Optimism to pessimism and back

Ample liquidity

Prices rise
Exogenous risk falls

Strong confidence

Prices collapse
Risk explodes

Liquidity evaporates

Confidence disappears
Politics and the economy

- Does the economy drive politics or do politics drive the economy?
- Bill Clinton in 1992 “it’s the economy stupid”
- 2020 “it’s the politics stupid”
- Political risk (or should say political uncertainty) the most important factor
  - Brexit, Trump, Ukraine, South China Sea, Quatar, Turkey, Venezuela, covid-19 ...
Systemic risk

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SRC video
1914 is perhaps the closest we ever got to a systemic crisis

• Globalism was at its peak in 1914
• The world’s financial system was highly integrated
• The assassination of Archduke Franz Ferdinand on June 28 changed all of that
• The important observation is that the financial crisis did not happen because of World War I.
• But in anticipation of it
• Confidence, and hence liquidity, disappeared
• It is the mechanism that matters
Mechanism

• Expectations of war built up
• Cross-border creditors repatriated
  • sterling and franc appreciated, rouble and dollar depreciated — gold standard unravels
• Expectation of crisis in London — run on gold at the Bank of England (BoE)
• Stock markets around the world *closed for months*
Reaction in London

- Widespread bankruptcies in City
- Suspension of fixed relationship between gold and money
- Quantitative easing (literally massively printing money)
- Market closures
- Moratoria on debt
- Bailouts
- Authorities went much farther than in previous and subsequent crises
- May have prevented *firesales*
The point is

- The financial system is based on trust
- We instantaneously switch from believing the best to believing the worst
- We don’t need anything real to cause a crisis
- *Anticipation is sufficient*
- We can cause a crisis by well placed, but incorrect, rumour
- Beware of fake news
Systemic Risk
Systemic vs. systematic

**Systematic risk** relates to non-diversifiable risk factors that affect everybody, perhaps the stock market.

**Systemic risk** relates to the danger of the entire financial system collapsing.
What is systemic risk?
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.”

- Arises from *interlinkages* as the failure of an individual institution may cause spillovers and even cascading failures
- Amplified by the inherent *pro-cyclicality* of banking and regulations
- The conditions for systemic risk tend to be created when *all outward signs point to stability* and low risk
Differing views on systemic risk

- The same word or phrase can have very different meaning depending on who says it. You will see many examples in this course.
- That certainly applies to systemic risk.
- Some look at extreme events, those that never happen.
- Others call bad crises systemic events.
- Policy response depends on one’s notion of systemic risk.
- We will discuss the policy response to Covid-19 later where the key question will be whether the Covid-19 crisis is a systemic crisis.
Worries about systemic risk

- Depends on size of financial system
- And how well a country is insulated
EU banking system (2015)

Assets as percentage of GDP

- Domestic
- Total

Countries:
- Slovakia
- Slovenia
- Sweden
- Romania
- Portugal
- Poland
- Netherlands
- Malta
- Latvia
- Luxembourg
- Lithuania
- Italy
- Ireland
- Hungary
- Greece
- United Kingdom
- France
- Finland
- Spain
- Estonia
- Denmark
- Germany
- Czech Republic
- Cyprus
- Bulgaria
- Belgium
- Austria
Importance of financial system to the UK

- Finance
- Whole economy
- Manufacturing

UK Output Index, 1995 Q1=100
Banks, bank size and politics

- Structure of financial sector matters
- Two countries have same sized banking systems
  - first has one bank
  - second has 10 equally sized banks
- First country is much more vulnerable
  - failure of the single bank more damaging than a few, but not all, of the 10
  - the single large bank is likely to have more political power than the 10 smaller banks combined
Should we eliminate systemic risk?

depends on how extreme the event is

- Extreme measures are needed to fully eliminate it
  - North Korea, Cuba, ...
- It would come at too high a cost
- We want banks to take risk
  - lending to risky small and medium size enterprises (SMEs) and the like
- With risk comes occasional failure
- So only way to eliminate systemic risk is to eliminate the financial system
- And that will severely hold back growth
Which is the most likely?

GDP over a century

3% growth
Which is the most likely?

GDP over a century

- 4% growth
- 3% growth

GDP is shown over a century with two lines indicating growth rates of 4% and 3%. The graph compares the GDP values against the years, with a trend line for each growth rate.
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
Instead

• Understand the fragilities of the financial system
• The danger it poses to society
• And the benefits it brings
• Best to try to develop policies that mitigate the frequency and severity of systemic crises
How often do systemic crises happen?

- The IMF/WB database implies a systemic crisis every 43 years on average
  - (you can download the data to take a look)
- So twice in a lifetime?
- This is an overestimate, as the database includes innocuous events
- Perhaps once–in–a–lifetime
The lifecycle of crises

- The person who was 20-year-old in 1929, retired in 1970
- End of Bretton Woods, start of Washington consensus
- Deregulation and liberalization
- Eventually culminating in a crisis in 2007
- And when the people born in 1997 retire, the seeds of the next crisis are laid
Dams
The measurement problem

- Suppose you measure the risk of flooding by the volume of water below a damn
- The risk will be very low right until the dam bursts
- And after that the risk will be high
- But it is false because the risk is high before the dam bursts
- And since the dam can’t burst twice the risk is gone after
- Connect to *actual risk* and *perceived risk* in Chapter 3 (endogenous risk)
Can we measure systemic risk?

- The next slide shows the ECB’s Composite Indicator of Systemic Stress
- Is it predictive or reactive?
- Did it tell us in 2003 that systemic risk was building up?
- It is very hard to measure systemic risk
- Because it is usually created out of sight
- So we end up measuring the wrong thing
Systemic risk

What is systemic risk?

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ECB Composite Indicator of Systemic Stress

0.0

0.2

0.4

0.6

0.8

Can it beat the FT?
Can it beat the FT?
Systemic risk
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GDP cost of crises. OECD. from 1870

- Greece 2007 – 2013
- Slovenia 1986 – 1992
- Turkey 1942 – 1945
- Finland 1916 – 1918
- Belgium 1916 – 1918
- Canada 1917 – 1921
- Spain 1935 – 1938
- France 1916 – 1918
- United States 1929 – 1933
- Estonia 1989 – 1993
- Canada 1928 – 1933
- Hungary 1942 – 1947
- Austria 1912 – 1919
- Greece 1911 – 1913
- Greece 1914 – 1917
- Latvia 1990 – 1993
- Italy 1939 – 1945
- Chile 1929 – 1932
- France 1939 – 1944
- Netherlands 1939 – 1944
- Japan 1943 – 1945
- Austria 1944 – 1945
- Germany 1944 – 1946
- Greece 1937 – 1945

0% -10% -20% -30% -40% -50% -60%
GDP cost of crises. OECD. from 2000

- Sweden 2007 – 2009
- Mexico 2008 – 2009
- Japan 2007 – 2009
- United Kingdom 2007 – 2009
- Hungary 2008 – 2009
- Denmark 2007 – 2009
- Italy 2011 – 2014
- Italy 2007 – 2009
- Turkey 2007 – 2009
- Slovenia 2008 – 2009
- Finland 2008 – 2009
- Turkey 2000 – 2001
- Luxembourg 2007 – 2009
- Spain 2007 – 2013
- Iceland 2007 – 2010
- Ireland 2007 – 2009
- Lithuania 2008 – 2009
- Latvia 2007 – 2010
- Estonia 2007 – 2009
- Greece 2007 – 2013

0% −5% −10% −15% −20% −25%
Who creates systemic risk?
Role of the market

- Profit–maximizing behavior
- Hyman Minsky (1992) *Stability is destabilizing*
- Like the crises from 2007, where all were blind to the hidden risk during the “great moderation”
- So is it all the fault of capricious, short-termist bankers?
  - subprime mortgage originators and securitizers
  - banks that borrow short and lend long
  - excessive risk taking
  - maximizing private wealth at expense of society
Role of the government

- Systemic risk can be greatly increased by some government policies adopted in the name of preventing such systemic risk.
- The US government has encouraged homeownership since mid-1970s
  - led to subprime mortgages and the overlooking of dangers
- Most governments like to have national champions (SIFI banks)
- Many governments see a large financial system as beneficial
- And all would like banks to make more risky loans (to SMEs)
Fisher Black (1995)

Fisher Black had even a stronger view in 1995:

> When you hear the government talking about systemic risk, hold on to your wallet!

> It means that they want you to pay more taxes for more regulations, which are likely to create systemic risk by interfering with private contracting ...

> In sum, when you think about systemic risks, you’ll be close to the truth if you think of the government as causing them rather than protecting us from them.
Systemically Important Financial Institutions

SIFIs

Global Systemically Important Banks

G-SIBs
What are SIFIs?

- Financial institutions whose failure might cause a systemic crisis
- Not considered very problematic before 2007
- Highly diversified institutions
- Losses in one domain were assumed to be offset by profits in other domains
- Therefore, very large banks were considered safer than smaller banks
Total Assets/GDP for largest SIFI in each country

- UBS Switzerland: 130%
- Santander Spain: 121%
- ING Netherlands: 115%
- HSBC United Kingdom: 90%
- BNP France: 86%
- RBC Canada: 60%
- Mitsubishi Japan: 57%
- Unicredit Italy: 47%
- DB Germany: 40%
- ICBC China: 30%
- JPM United States: 13%
Why should we care about SIFIs?

- Banks have incentive to become big, interconnected, dangerous and even badly run
- It is beneficial to become a SIFI/G-SIB
  - lowers funding costs
  - and provides comfort to counterparties
  - they know that they would receive public aid in case of difficulties (moral hazard)
Politics

• Governments like national champions
• They might say: "What is good for the national champion is good for finance and the country”
• National banking champions are G-SIB/SIFIs
How to identify SIFIs?

- No compromise on how to identify them
- But one should consider:
  1. extent of leverage and off-balance sheet exposure
  2. interconnectedness
  3. impact of its distress on real economy
  4. possibility of triggering firesales in the entire system
- Relatively clear classification for banks, less so for asset managers, insurance companies and sovereign wealth funds
Fundamental Origins of Systemic Risk
What is systemic risk?

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Procyclicality

A

B

C

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Procyclicality

A+B

A+C

Outcome

Outcome

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Procyclicality

- A process that is positively correlated and amplifying a cycle is said to be **procyclical**
- Banking is inherently procyclical
  - banks have surplus capital when things are good and lend too much to increasingly low quality borrowers
  - banks have too little capital and are too conservative in busts
- We need causality between both sides
- Temperature and saving cost of heating is not pro-cyclical as there is causality
- Consumption and growth are, they feed on each other
Fire–sale externalities

- Externality is the cost or benefit incurred by someone not agreeing to the action causing the cost or benefit
- The financial system is full of externalities
- *Firesale externalities* are where the sale of assets during crisis is forced — when prices are already low and falling — causing prices to fall even more
- *Vicious feedback*
Fire–sale

External shock

Financial difficulties
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Fire-sale

External shock

Financial difficulties

Risk increases
Systemic risk

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Policy

Fire–sale

External shock

Financial difficulties

Risk increases

Forced sales

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Fire-sale

External shock

Financial difficulties

Prices fall

Risk increases

Forced sales

Prices fall
Fire–sale

External shock

Financial difficulties

Firesale

Prices fall

Forced sales

Risk increases

Forced sales result in lower prices, which leads to financial difficulties. This, in turn, triggers a fire sale, where assets are sold at a discount to quickly raise cash. This process escalates the risk and can lead to a systemic crisis. 

Origins

Structure

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Policy
Leverage and deleverage

• When we invest with borrowed money, we amplify the profits and losses
• Financial institutions often use high leverage to boost profits in boom times
• This means during crises their losses can be spectacular
• We return to this frequently later in the course
• One example is via bank balance sheets and capital regulations
Information asymmetry

- Financial institutions only have limited information about the counterparties
- It hard to get an idea of the net value of certain over–the–counter instruments (like CDSs)
- Crisis of confidence
- See slide after next
Interdependence

- Financial system is a network of interwoven obligations
- See next slide
- Institutions can have direct and indirect connections
- Gives rise to potential for domino–style failure
A, B and C are exposed to each other
D is exposed to B and C
D is indirectly exposed to A via B and C
Perverse incentives

- Some have an incentive to *increase* distress
- Lenders who have hedged through *CDSs* (discussed later) can often make higher returns from CDS payouts
- A predatory approach would be to purchase lots of debt in conjunction with a large number of CDS contracts
- This could render bankruptcy more attractive than solvency

Six Flags, an American theme-park operator filed for bankruptcy protection on 13th June 2009, as a result of their bondholders refusing to aid the debt restructuring effort. The apparent culprit was a Fidelity mutual fund turning down an offer that would have granted creditors an 85% equity stake.
Blackstone: Exploiting CDSs

- Blackstone’s GSO buys a CDS contract on a struggling company
- GSO offers company and offers it very attractive financing
- But it has to default in a way that triggers a CDS payout
More on the causes of systemic risk

- We will discuss many more causes later in the course
- For example endogenous risk
- As well as how we cope with systemic risk
- And to what extent regulations protect us and can even cause harm
Structure of the financial system
The three parts

1. Service providers
2. Governments
3. Others
Service providers — Banks

- The traditional (and always wrong) view of a bank is an institution that simply takes deposits and makes loans
- Banks also borrow elsewhere (e.g. bonds and interbank market)
- Some are also broker-dealers
- Some engage in proprietary trading
- Most larger banks own a number of banks (bank holding firms)
- When international can have subsidiaries or branches
  - This distinction becomes important for financial stability and regulations
Service providers — Investors

- Hedge funds (partly regulated)
- Pension funds
- Sovereign wealth funds
- Asset managers
- Insurance companies
Service providers — *Shadow parallel banking*

• Financial institutions that provide banking type services but are not banks, e.g.
  1. Some structured credit
  2. Fintech (1/3 is unregulated in Europe)
     2.1 Credit, deposit and capital-raising services
     2.2 Payments, clearing and settlement services
     2.3 Investment and investment-management services
     2.4 Other, like credit-reference firms, comparison services and various kinds of compliance activity
  3. We return to this
Government

- Central and local government
- Government agencies — especially various regulators
- Politicians
Others

- Journalists
- Lobbyists
- Pundits
- NGOs
What sort of crisis is Covid-19?

- It is on exogenous and not endogenous shock (we discuss the distinction in a later chapter)
- It is mostly a demand shock — reduced demand for certain types of services, like restaurants, theater, arts and sports
- By and large has not affected manufacturing
- And the economic impact is severe but targeted
Covid — so far — is not a financial crisis

- The focus of this course is the financial system and the impact on the financial system has been small
- We will discuss the central bank interventions and how they may have prevented a systemic crisis, in the central bank chapter
- And we also return to it in the foreign exchange and regulation chapters
- So to conclude, the Covid crisis is not a financial crisis
- At least so far
Policy
Financial and economic cycles

• The *economic cycle* is the fluctuation of the economy between periods of expansion (growth) and contraction (recession)
• The *financial cycle* captures fluctuations in the credit, housing and equities markets — US dominated
• They tend to be longer than the economic cycle, and are often much more dramatic
• Financial cycles in each country tend to be closely related to the financial cycles in the rest of the world, becoming stronger over time
• The economic cycles are much less related across countries
Financial and economic policy

- The governments have various policy objectives that both overlap and conflict with each other
  1. Fiscal
  2. Monetary
  3. Financial stability
- All three were used in 2008 and 2020
- But they had a very different impact because those two crises were quite different