

# **THEORIES OF FINANCIAL INSTABILITY AND THE ROLE OF INCENTIVES**

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# Introduction

- In this lecture we provide an overview of the nature of financial instability in theory, and focus in particular on the role of incentives
- Systemic risk, financial instability or disorder entail heightened risk of a financial crisis - “a major collapse of the financial system, entailing inability to provide payments services or to allocate credit”.
- Definition excludes asset price volatility and misalignment – only relevant as affect liquidity or solvency of institutions
- Understanding of theory and the incentives that it highlights are essential background for macroprudential surveillance – and for crisis resolution

# Structure of lecture

1. Introduction
  2. Extant theories of financial instability
  3. Incentives in the debt and equity contracts
  4. The safety net and regulation
  5. Other key incentive issues
  6. Historical illustrations of incentive problems
  7. Conclusion
- Appendix: A possible framework for investigation

# 1 Extant theories of financial instability

- Selective synthesis required of different theories
  - Financial fragility: financial crises follow a “credit cycle”, triggered by an exogenous event (“displacement”), leading to rising debt, underpricing of risk and asset bubbles followed by negative shock and banking crisis;
  - Monetarist: bank failures impact on the economy via a reduction in the supply of money, while policy regime shifts are hard to allow for in risk management;

- **Uncertainty:** as opposed to risk as a key feature of financial instability, linked closely to confidence, and helps explain the at times disproportionate responses of financial markets in times of stress and difficulties with innovations;
- **Disaster myopia:** that competitive, incentive-based and psychological mechanisms lead financial institutions and regulators to underestimate the risk of financial instability in presence of uncertainty;
- **Asymmetric information and agency costs:** well-known market failures of the debt contract help to explain the nature of financial instability e.g. credit tightening as interest rates rise and asset prices fall; highlights incentives discussed later;

- Herding:
  - among banks to lend at excessively low interest rate margins relative to credit risk;
  - among institutional investors as a potential cause for price volatility in asset markets, driven e.g. by peer-group performance comparisons, that may affect banks and other leveraged institutions;
- Industrial: effects of changes in entry conditions in financial markets can both encompass and provide a supplementary set of underlying factors and transmission mechanism to those noted above, e.g. new entry leading to heightened uncertainty on market dynamics

- Inadequacies in regulation:
  - mispriced safety net (deposit insurance and lender of last resort) generates moral hazard leading to risk taking, especially if deregulation cuts franchise value of banks, unless supervision is strict
  - Quasi fiscal lending which banks are forced to undertake to finance insolvent state enterprises
- International aspects of financial instability:
  - Exchange rate policy – resistance of authorities to exchange rate pressure leading to unsustainable interest rate rises for domestic economy
  - Institutional investors (including hedge funds) and herding
  - Foreign currency financing – risk of mismatch and crisis when exchange rate depreciates

- Key risks incurred as a consequence of the above –
  - Credit risk - risk that a party to contract fails to fully discharge terms of the contract
  - Liquidity risk - risk that asset owner unable to recover full value of asset when sale desired (or for borrower, that credit is not rolled over)
  - Market risk (interest rate risk) - risk deriving from variation of market prices (owing to interest rate change)
- Risks may be particularly acute when a “bubble” in stock or real estate prices deflates, given credit finance of part of investment

- Manifestations of instability
  - bank runs: panic runs on banks (which may follow the various stimuli identified by the above theories) link to the maturity transformation they undertake, and the relatively lesser liquidity of their assets; such theory can also be applied to securities market liquidity;
  - contagion: failure of one institution or market affects others either via direct counterparty/investor links or more general uncertainty about solvency in presence of asymmetric information
  - generalised failure of institutions due to exposure to common shock such as an economic downturn

## 2 Incentives in the debt and equity contract

- Theories of financial instability, as outlined above, hint at importance of incentives in generating vulnerability
- Area of analysis rarely covered systematically or in detail, but essential to appropriate surveillance and policy design
- We begin by focusing on incentives in the debt and equity contracts
- We then seek to present some fundamental aspects, examples from history, and in Appendix a possible systematic approach to the subject

- Basis of incentive issues is asymmetric information, combined with inability to write complete contracts, specifying behaviour in all circumstances. General corporate finance issue also applicable to (unregulated) financial institutions
- Gives rise to problems of adverse selection (ex ante) and moral hazard (ex post)
- Adverse selection – pricing policy induces low average quality of sellers in a market, where asymmetric information prevents buyer distinguishing quality
- Moral hazard – incentive of beneficiary of a fixed value contract in the presence of asymmetric information and incomplete contracts, to change behaviour after the contract has been signed, to maximise wealth to the detriment of the provider of the contract

# Debt contract

- Adverse selection e.g. in terms of those taking loans at high interest rates, who will be those less likely to pay back
- Moral hazard e.g. in terms of conflict between holders of debt and equity, where equity holders prefer riskier plan although it does not maximise overall value and is contrary to e.g. depositors interests (see example). Note distinction from fraud. Moral hazard increases, the lower net worth (capital adequacy)
- Example, bank lending to finance investment in commercial property, even at prices above fundamentals (possibly entailing a bubble), given equity holders' incentives

# Moral hazard illustration

Financial plan (preferred by)	Payoff in period 2		Market value in period 1		
	State 1	State 2	Total	Debt	Equity
A (lender)	7	7	7	5	2
B (borrower)	1	10	5.5	3	2.5

- Borrower shifts downside risk to lender but benefits from upside, despite greater uncertainty
- The debt/equity conflict is greater when the value of equity is low

## Application to banking – franchise value concept

- When banking system is uncompetitive, banking licence is valuable so no incentive to take risks (higher market volatility and lower capital) and jeopardise it
- When there is increased competition, value of bank franchise falls, so loss from bankruptcy is less - incentive to go for higher risks, increasing margins at cost of heightened volatility of profits and hence risk to debtors (depositors)
- Applicable without safety net, but latter aggravates (see below)

## Application to insurance

- Given typical pattern of claims, in presence of asymmetric information, and lacking regulation, incentive for owners to not put up capital and rely on premium inflows and investment income to pay claims, while owners invest equivalent of capital funds in the securities markets.

- Heightened risk of bankruptcy – particularly likely if competition fierce

## Application to equity asset management

- Those supplying funds to asset managers have little control over managers, so scope for risk shifting
- Payoff to asset managers akin to debt contract (limit to downside)
- Possible generation of bubbles (Allen) willingness to invest in asset at price above fundamentals
- Link to credit expansion and uncertainty thereof as some leveraged investment (hedge funds, equity extraction from mortgage lending)

# Equity contract and management

- Moral hazard issue is of conflict of managers and shareholders
  - divorce of ownership and control in corporations (including banks), and shareholders cannot perfectly control managers acting on their behalf.
  - managers have superior information about the firm and its prospects, and at most a partial link of their compensation to the firms' profitability - incentives to divert funds in various ways away from those who sink equity capital in the firm
- Adverse selection in new issue market (offered to public when insiders' superior information enables them to profit)

## How are these problems countered?

- For both debt and equity, protection against adverse selection is screening, moral hazard is monitoring (including “risk management”, “market discipline” and “corporate governance”)
- Ability to do so depends on features such as disclosure, legal protection, structure of shareholding and debt claims

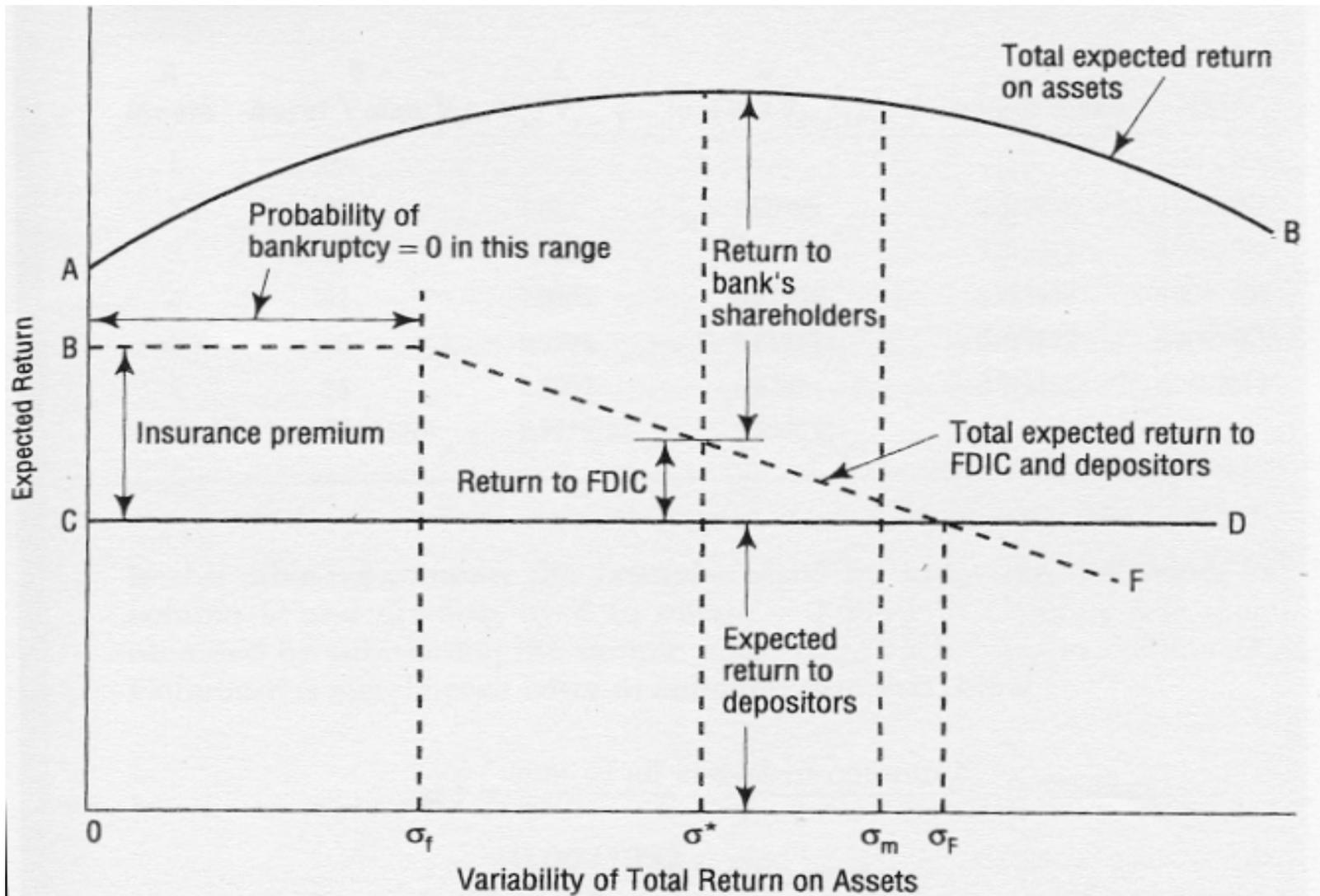
# Additional economic issues

- Contagion - one market affects another as cannot distinguish cross market hedging and information based trades
- Free rider problems - others take advantage of one agent's information gathering
- Rational herding - (1) payoff of strategy increases with number adopting it (2) Safety in numbers in imperfectly informed market (3) assume others have superior information and follow their actions, ignoring one's own information
- Uncertainty e.g. following financial liberalisation may aggravate incentive problems

# 3 The safety net and regulation

- Existence of deposit insurance justified by externalities arising from bank runs/insolvency
- Worsens moral hazard as incentives for depositor monitoring nullified, and equity holders heightened incentive to take risks/minimise capital to maximise option value of insurance (unless insurance correctly priced)
- Lender of last resort mitigates problem by making rescues uncertain, but market may correctly assume some institutions “too big to fail”
- Problems worsened by forbearance
- Similar issues can arise for exchange rate

# Risk and return for an insured bank and its shareholders



- Policy response to incentives generated by safety net
  - historically structural regulation, effectively keeping banks' net worth/charter value high, at cost of poor quality financial services for economy
  - deregulation leads to need for capital adequacy and prudential regulation, since as noted competition cuts net worth of banks, and generates risk taking incentives
  - capital adequacy generates incentive issues of its own, such as the incentive to maximise risk in each “bucket” in Basel I, and to generate “credit cycles” owing to leverage to risk in Basel II
  - failure of regulation combined with external effects of response to incentives often underlies financial instability

# 4 Other key incentive issues

- Loan officer behaviour – if judged on cash flow/front end fees and not long term return from loans, maximise volume at cost of adverse selection. Often driven by managers competing for market share, poorly controlled by equity holders
- Asset manager behaviour – owing to performance measurement, seek to emulate others, generating herding behaviour, destabilising markets
- Fiscal incentives promoting financial instability e.g. Commercial property investment (Sweden)
- Accounting aspects obscuring true value, offering adverse incentives (Japan), or preventing disclosure

- Financial innovations which increase erosion of franchise value/lead to errors in risk assessment
- Legal framework and its impact on the quality of monitoring
- “Disaster myopia” – going beyond moral hazard
  - Shocks are uncertain events (where probabilities hard to assign) meaning subjective views of risk depart from objective in period of calm
  - Risk management goes awry. No market mechanism ensures risks of crisis (as opposed to cycle) correctly priced or allowed for in capital adequacy; capital ratios decline and interest rate spreads shrink
  - Causes (i) competition from imprudent creditors (ii) psychologically-induced errors by management (iii) institutional factors (iv) disaster myopia among regulators

# 5 Historical illustrations of incentive problems

- The Asian crisis
  - Implicit guarantees to foreign depositors, weakening monitoring of domestic exposures
  - Implicit guarantee of a fixed exchange rate, leading to willingness to lend and borrow in foreign currency
  - Poor risk control in lending
  - Poor corporate governance of banks and borrowing firms
  - Herding behaviour by foreign banks and institutional investors in entering prior to crisis and leaving when crisis began

- US Savings and Loans crisis - events
  - Maturity mismatch crisis and loan quality crisis
  - Former linked to interest rate ceilings and disintermediation
  - Easing of ceilings led to mismatch of assets and liabilities, leading to widespread insolvency
  - Deregulation allowing diversification, notably into real estate
  - Forbearance rather than closure of insolvent and deposit insurance to protect deposits
  - Risk taking on asset side
  - Eventual need for a bailout and regulatory tightening

- Incentive aspects
  - Ceilings led to vulnerable balance sheets, aggravated by financial innovation of money market funds
  - Cutting of supervisory budget led to inadequate monitoring
  - Deregulation, forbearance and deposit insurance (hence no deposit monitoring) led to moral hazard and risk taking
  - Fiscal regulations, later reversed, led to overbuilding followed by collapse in prices of real estate
  - Inadequate corporate governance permitted fraud and insider abuse by managers in many S and Ls

- Stock market crash of 1987 – events
  - Buoyant investor expectations, leading to suspicion of a bubble. Impression/illusion of high liquidity
  - “News” was not commensurate with outcome
  - Portfolio insurance and index arbitrage interaction
  - Institutional investors heavily involved in selling, especially of cross border holdings
  - Margin calls to traders of equity futures and options
  - Liquidity squeeze on brokers, threat of gridlock in payments and settlement
  - Banks feared brokers were insolvent and were unwilling to expand credit - Fed expanded liquidity to avoid systemic risk

- Incentive aspects
  - Asset manager incentives to avoid performing worse than counterparts, despite awareness of overvaluation
  - “Guarantees” by portfolio insurance (financial innovation) that enhanced willingness to hold high-priced stocks
  - Competitive behaviour of underwriters seeking market share, leaving them vulnerable to price falls
  - Incentives to sell cross border holdings generating worldwide contagion
  - Banks’ incentives to avoid lending to brokers, at cost of financial system collapse
  - Possible longer term issues of a perception the Fed underpins markets - “the Greenspan put”

# 6 Fitting incentives into macroprudential surveillance

- Areas for investigation of incentives
  - Accounting standards and disclosure practices as well as market structures to infer scope of market discipline
  - Legal rules for investor protection, and enforcement of corporate governance
  - Quality of financial supervision to offset moral hazard arising from safety net
  - If questions reveal inadequate control of risk, look at internal governance of banks and major corporate borrowers, and policy recommendations to improve

- Standard indicators of financial instability (“generic sources of crisis”)
  - Regime shift to laxity or other favourable shock
  - New entry to financial markets
  - Debt accumulation
  - Asset price booms
  - Innovation in financial markets
  - Underpricing of risk, risk concentration and lower capital adequacy for banks
  - Regime shift to rigour – possibly as previous policy unsustainable - or other adverse shock
  - Heightened rationing of credit
  - Operation of safety net and/or severe economic crisis

# Generic patterns of financial instability

<b>Phase of crisis</b>	<b>Nature</b>	<b>Example of features</b>
Primary (favourable) shock	Diverse	Deregulation, monetary or fiscal easing, invention, change in market sentiment
Propagation - buildup of vulnerability	Common – main subject of macroprudential surveillance <b>and operation of incentives</b>	New entry to financial markets, Debt accumulation, Asset price booms, Innovation in financial markets, Underpricing of risk, risk concentration and lower capital adequacy for banks, Unsustainable macro policy
Secondary (adverse) shock	Diverse	Monetary, fiscal or regulatory tightening, asymmetric trade shock
Propagation - crisis	Common – <b>operation of incentives</b>	Failure of institution or market leading to failure of others via direct links or uncertainty in presence of asymmetric information – or generalised failure due to common shock
Policy action	Common – main subject of crisis resolution	Deposit insurance, lender of last resort, general monetary easing
Economic consequences	Common – scope depends on severity and policy action	Credit rationing leading to fall in GDP, notably investment

# Conclusions

- A synthesis of theory provides a set of economic factors and developments common to crises
- Consideration of incentives provides a rich menu of areas for investigation by regulators and central banks
- Theory and incentives give potential early warning when balance sheets themselves are not yet adverse
- Reference to history as well as theory essential in arriving at correct judgements
- Incentive assessment needs to be only a part of the picture – not ignoring monetary policy, macro-prudential indicators, international developments and other key aspects

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# Appendix: A possible framework for investigation of incentives

- Identification of elements of environment in which financial transactions undertaken (which may influence incentives):
  - Market structure and availability of financial instruments
  - Government safety nets
  - The legal and regulatory framework
- Categorisation of financial system
- Incentive assessment (focusing notably on bank management, borrowers and depositors) in the light of this

# Elements of financial environment

- Market structure and financial instruments (MFI)
  - Competing financial instruments and market discipline (e.g. looking at importance of capital market and foreign financing)
  - Level of competition, franchise value and risk taking (e.g. looking at structure of banking system and deregulation)
- Government safety net (GSN)
  - Exchange rate guarantees
  - Deposit insurance and perception of lender of last resort (is it genuinely discretionary – are banks allowed to fail?)

- Legal framework (LF) – to discipline management, protect debt and equity holders
  - Quality of laws and regulations
  - Standard of enforcement
- Taxonomy of financial systems – 4 types
  1. All three play a major role (OECD countries)
  2. Only MFI (poorer transition economies and other emerging market economies recently liberalised – legal system still in flux, and lack of resources to offer credible guarantees)
  3. Only MFI and GSN (Asia prior to crisis – weak legal and regulatory systems but extensive government involvement)
  4. Only GSN (emerging economies with financial systems not yet liberalised, use government institutions and direct instruments)

## Examples of indicators

- $MFI=1$  if household holdings of non bank financial institution's liabilities high, or securities market large
- $LF=1$  if at least one case of corporate bankruptcy or bank closure in non crisis period
- $GSN=1$  if implicit or explicit exchange rate or deposit insurance guarantee

- Areas for investigation of incentives
  - Accounting standards and disclosure practices as well as market structures to infer scope of market discipline
  - Legal rules for investor protection, and enforcement of corporate governance
  - Quality of financial supervision to offset moral hazard arising from safety net
  - If questions reveal inadequate control of risk, look at internal governance of banks and major corporate borrowers, and policy recommendations to improve

# Comments and policy aspects

- “Situating” a country is only part of the story
- Need to look at institutional investors and insurance companies as well as banks
- Incentives may act differently for inexperienced institutions (i.e. new entrants) as well as over the cycle
- Need for focus on corporate governance, alignment of incentives with risk. Need to monitor shifting ownership structure

- Need to encourage subordinated debt issue to help market discipline
- Categories should not be seen as fixed – need to move to OECD “quadrant” (improving disclosure, legal protection for financial claims, supervision, alignment of cost with risk, e.g. for deposit insurance – US example)
- Need to assess what combination of incentives is threatening – consider events internationally, and “stress test” how incentives would operate in a shock

# The financial stability e-group

- [groups.yahoo.com/group/financial\\_stability](http://groups.yahoo.com/group/financial_stability)
- Members include Charles Goodhart, Aerd Houben, Martin Anderson, Thorvald Moe, Neil Courtis...
- The Rubric:
  - The aim of this group is to bring together members of the policy, academic and market communities to present and discuss research and analysis on financial stability and related regulatory issues. Topics may include: theory and analysis of financial crises, bank failures, financial-market volatility, financial fragility in the household and corporate sectors, macroprudential indicators and financial regulation against systemic risks.