

**Financial Markets and  
Economic Performance  
Lecture III: Banks**

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Banks have proved themselves to be the most hazardous economic institution known to man. Breakdowns in banking lie at the centre of most financial crises. And banks are unusually effective at spreading financial distress, once it starts, from one place to another.

It is tempting to conclude that banks should simply be abolished.  
Unfortunately, ...

*Economist May 3<sup>rd</sup> 2003*

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# Overview

## III.1 Recent trends

III.2 Why do banks exist?

III.3 The fragility of the banking sector

III.4 Regulation

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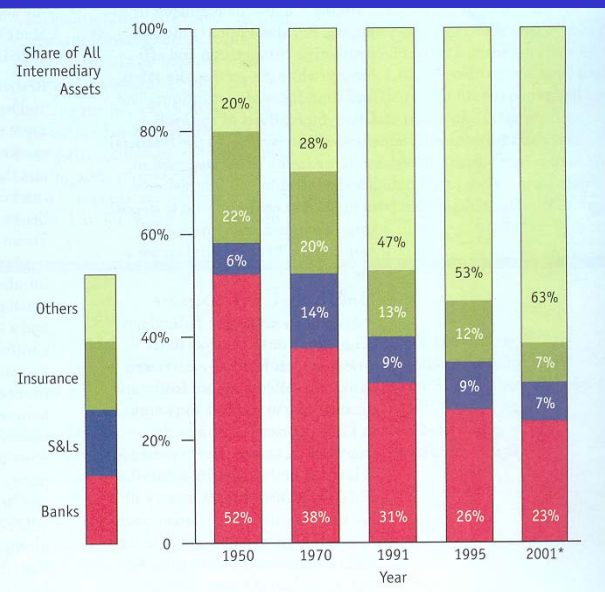
# Key Insights

1. Banks play a crucial role in the economy and other lenders are imperfect substitutes
2. Banks' ability to fulfill this role fluctuates over time
3. Sensitivity to shocks and the possibility of instability has always been a concern; "solutions" to instability problems often create new problems (e.g., deposit insurance and capital controls)
4. We have to be especially aware of the proposed Basle II regulation because it looks like it will not appropriately take into account the endogenous nature of risk.

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# Long-Term Changes

1. More competition:
  - Share of commercial banks is declining
2. Banks are getting bigger
3. A new financial company emerges
4. Regulation more focused on capital and less on reserves



\*As of June 30, 2001.  
SOURCE: Budget of the U.S. Government—Fiscal Year 1993; "Modernizing the Financial Services Sector," U.S. Government Printing Office (1992): 259. Figures for 1995 are from Flow of Funds Account, Z1, Fourth Quarter 1995 (March 8, 1996): 72 and Flow of Funds Accounts, Z1, Second Quarter, 2001 (September 18, 2001): 58.

Long-Term Changes:  
Declining Share of  
Commercial Banks

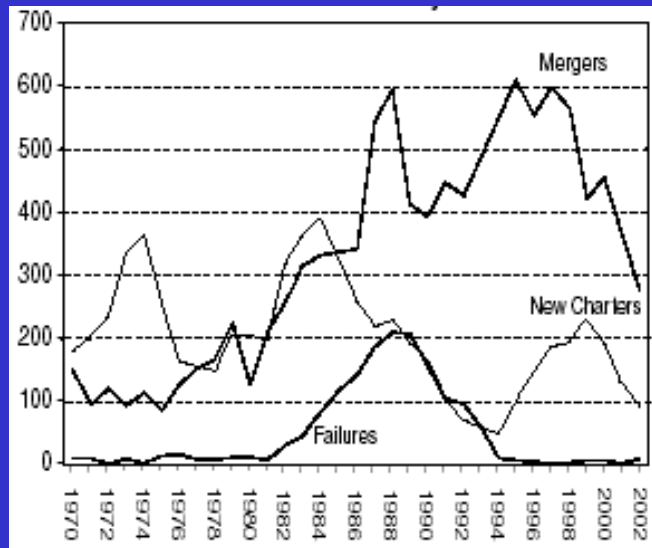
## Long-Term Changes: Consolidation Number of US Commercial Banks



Source: H.M. Ennis (2004)

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## Long-Term Changes: Consolidation Causes for reductions in number of banks



Source: H.M. Ennis (2004)

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## Long-Term Changes: Consolidation

1. Citicorp & Travellers  $\Rightarrow$  Citigroup
2. BankAmerica Corp & Nationsbank  $\Rightarrow$  BankAmerica
3. BancOne & First Chicago  $\Rightarrow$  Bank One
4. Norwest & Wells Fargo  $\Rightarrow$  Wells Fargo

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## Long-Term Changes: Consolidation

US: During the Great Depression the US had many small and undiversified banks and the system basically collapsed. Between 1930 and 1933 more than 9,000 banks failed (1/3 of the total) and 34.5% of all bank offices closed

Canada: Over the period from 1929 to 1933 *no* bank failed and number of offices declined with 10.4%

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## Small Firms and Increased Consolidation?

	small banks total assets < \$1 billion	large banks total assets > \$1 billion
C&I loans as % of total assets	11.5%	14.6%
Small business loans as a % of all C&I loans	66.6%	42.7%

Note: small business loans are identified as loans less than \$1 million  
Source: Carter and McNulty (2003)

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## Small Firms and Increased Consolidation?

### Firm and contract characteristics by bank size

	<100M	100M-1B	1B-10B	10B+
distance to firm (miles)	15.0	9.5	19.3	71.4
single lender (1=yes)	0.62	0.50	0.50	0.41
firm size (\$M)	0.704	1.75	3.86	5.70
loan amount (\$M)	0.18	0.38	1.20	2.40

Source: Berger, Miller, Petersen, Rajan, Stein (2004)

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## Long-Term Changes: New Financial Company

Values of the Targets of Financial Institutions' M&A Activity, 1985-99

Target Institution	Europe: Acquiring Institution				United States: Acquiring Institution			
	Commercial Bank	Securities Firm	Insurance Company	Total	Commercial Bank	Securities Firm	Insurance Company	Total
Commercial bank	377.4 (48.6)	33.2 (4.3)	49.4 (6.4)	460.0 (59.2)	489.2 (56.1)	6.7 (0.8)	73.5 (8.4)	569.4 (65.3)
Securities firm	22.8 (2.9)	50.8 (6.5)	11.5 (1.5)	85.1 (11.0)	23.5 (2.7)	114.3 (13.1)	16.1 (1.8)	153.9 (17.6)
Insurance company	40.2 (5.2)	33.0 (4.2)	159.0 (20.5)	232.2 (29.9)	0.6 (0.1)	31.2 (3.6)	117.4 (13.5)	149.2 (17.1)
Total	440.4 (56.7)	116.9 (15.0)	219.9 (28.3)	777.3 (100.0)	513.3 (58.8)	152.2 (17.4)	207.0 (23.7)	872.5 (100.0)

Source: Securities Data Company.

Note: Top figures are the sum of all target institutions' market value of equity just before being acquired, in billions of dollars; figures in parentheses are the percentage of the total.

## Summary of Introduction

- Banks are getting bigger
- Big banks lend less to small firms than small banks
- Not clear yet whether big banks will increase lending to small firms in the future (if yes then this might imply that business cycles will become less severe)
- Big banks are more diversified which would mean that banks can withstand shocks better but it is not clear whether this means that banks will take on bigger risks

## Discussion

- As banks become larger and more diversified will they take on more risk leaving the institution equally risky? Is this enforced by increased competition?
- Can the huge new institutions be efficiently controlled or is the consolidation observed in the banking industry a repeat of the conglomeration boom of the 60's?

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## Overview

III.1 Recent trends

**III.2 Why do banks exist?**

III.3 The fragility of the banking sector

III.4 Regulation

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# Why Banks?

## Bank characteristics:

- Intermediary
- Liabilities are due upon demand
- Longer-term assets

## Alternatives:

- Borrowing without intermediary (commercial paper)
- Two separate institutions:
  - one takes demand deposits and invest in money market
  - one take finances loans with long-term deposits

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# Why Banks?

1. Banks as delegated monitors
2. Banks as information providers
3. Provide deposits that are available upon demand and still earn high return
4. Combining short-term liabilities and long-term assets creates discipline for banks to be careful

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## I. Banks as Delegated Monitors

Without intermediaries firms would have to borrow from several different lenders

This implies a duplication of monitoring costs. Moreover, there is a free-rider problem; if a lender monitors the firm he carries the whole cost by himself but all lenders benefit to some extent

Having intermediaries solves both problems, but ...

## Who monitors the monitor?

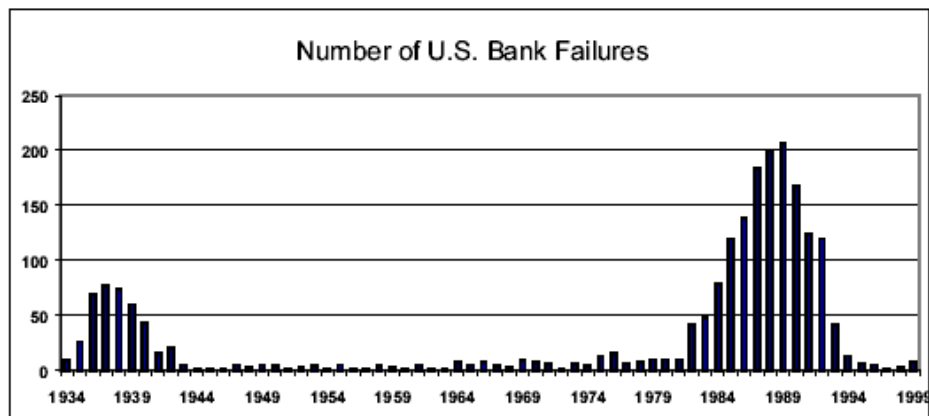
- With debt contracts you only have to monitor the borrower if the borrower is not doing well
- In theory, therefore, there is less need to monitor banks because the chance that banks perform poorly is smaller given that they invest in many loans
- Note that you cannot avoid the problem by letting individual lenders hold well-diversified loan portfolios. The idea is that if you don't (threaten to) monitor, the borrower will take advantage of the lender. So if a number of individuals hold well-diversified portfolios each of them would still have to engage in monitoring the same firm

## Banks as Delegated Monitors

- In practice many (especially smaller) banks concentrate on particular regions or industry sectors and clearly are not that safe
- Even though the big losses due to Enron will not be a major concern to the depositors and debt providers of J.P. Morgan Chase, its equity providers probably would have liked to see some more monitoring
- If bank capital is important for the ability of the bank to fulfill its role as an intermediary then these kind of losses can still have negative effects on the economy

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## Bank Failures



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## Banks as Delegated Monitors

- It is important to note that unlike mutual funds and other investment funds, banks do not provide detailed information on the performance of their investment portfolio

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## Difficulty to Evaluate Banks

Disagreement between bond raters over new issues  
1983-1993

Type of issuer	% Moody's ≠ S&P	Average absolute gap	Rating gap (%)		
			= 1	= 2	= 3
Banks	62.9	0.83	44.81	15.57	2.48
Other issues	50.0	0.65	38.80	9.27	2.67

Ratings are given a numerical value as follows: AAA = Aaa = 1, AA+ = Aa1 = 2, ...

Source: Morgan (2002)

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## II. Banks as Information Providers

- It would be efficient if one firm could research projects proposed by firms and then sell the information to investors. Because of the following two problems, such activity may not generate enough return.
- Appropriability: investors buying the information might sell it.
- Credibility: how to know that the information is accurate.
- Banks research firms and get rewarded for their efforts by the spread they earn not by selling the information. The fact that banks risk some of their own equity gives credibility.
- Note however that a bank's lending decision does provide info and so you don't really get rid of the free-rider problem

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## III. Earning Long-Term Returns with Short-Term Funds

- Suppose the average return on long-term investment is 10% and there are substantial costs to liquidating long-term investments
- Suppose the average money market return is equal to 4%
- Individuals have random liquidity needs and so would be hesitant to invest in long-term investments
- There is substantial independence between the random events that give rise to the need for liquidity (for example, we don't all need a root canal at the same time)
- By collecting the funds of many individuals and keeping part of it in liquid funds, banks can (i) earn a higher return and (ii) provide individuals with insurance

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## IV. Short-Term Liabilities and Long-term Assets

Disadvantage: Bank Run (more later)

Advantages:

- The threat of immediate withdrawal will discipline the intermediary to keep a close eye on the borrower
- Loans typically come with lines of credit which, just like deposits, requires holding cash which doesn't earn interest. If the shocks to withdrawals and shocks to the use of lines of credit are not perfectly correlated it is beneficial to combine these functions

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## Loan Sales

In the last decade the practice of selling loans by banks has grown enormously

The above arguments don't explain why this practice exists and why firms don't directly borrow from the investor who buys the loan.

- Reputation effects may matter
- Banks often keep the most risky part (i.e., interest payments)

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## Why are banks so special?

### Relationship Lending

- US: More than 8,000 banks
- Peterson and Rajan (1995): 50% of the firms in the sample are located within 2 miles of their primary institution and 90% are within 15 miles
- Elliehausen and Wolken (1990): Of the small and medium-sized firms that used a commercial bank only 8.3% used a non-local bank (not within 30 miles)

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### Relationship Lending

#### Advantages:

- Firms that have been with the same bank have greater access to credit especially if they rely on a single bank and some studies have found that a longer bank relationship lowers interest rates and collateral requirements on loan commitments
- By relying on future rents long-term relationships increase contracting flexibility (e.g., renegotiability). For example, banks can charge relatively low rates initially if they can make up any losses by earning monopoly rents on good firms in the future. Note that this requires there to be rents and the advantages would disappear in competitive markets (recall the increased competition and declining share of commercial banks)

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## Relationship Lending

### Disadvantages:

- If the bank is in trouble so is the firm.
- If a firm tries to switch banks, then the new bank will offer at best rates corresponding to “average quality” and possibly less if switching banks is considered a negative signal. Banks with above-average clients will exploit this.
- When relationships are important then one has to be careful about downward risk; negative shocks can quickly destroy relationships but it takes time to build relationships.

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## Continental Illinois Bank

In 1984 7<sup>th</sup> largest US bank holding company

During the bank's impending insolvency:  
client firms incur loss of on average 4.2%

In response to the FDIC rescue announcement:  
client firms incur gain of on average 2%

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## Relationship Lending

### Summary

- Relationship lending reduces important frictions
- Because it takes time to build relationships and relationships can fall apart quickly, the presence of relationships have important implications on the severity of economic downturn and the difficulty of recovering after a major crash

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## Why do banks exist?

### Summary

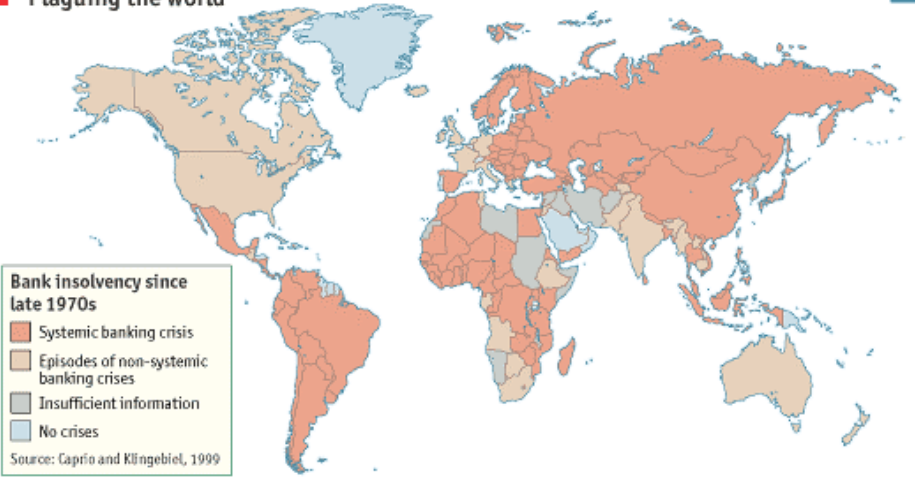
- Banks make it possible that a higher return can be made on assets that are available upon demand (although it looks like the bank pockets most of it)
- Banks make it possible that projects get financed that couldn't get financed when the frictions are such that contracts between individual lenders and borrowers are not possible
- Although banks reduce frictions and increase the efficiency of financial markets, the people who work for and own banks are no saints and we still have to be aware of possible frictions and inefficiencies.

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### III.3 Fragility of Banks

Plaguing the world

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### Fragility of Banks:

short term assets < short-term liabilities

#### Assets

#### Liabilities

Short-Term:  
Reserves  
Gov. Securities

Short-Term:  
Deposits

Long-Term:  
Loans

Long-Term:  
Debt  
Equity

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## Bank Run

Is it possible that there is a run on solvent (i.e. positive equity) banks? Yes, if immediate liquidation of assets occurs at a loss.

If I expect everybody else to immediately withdraw their deposits, forcing banks to sell assets at a loss then the bank may become insolvent, that is, bank won't be able to pay back my deposits  $\Rightarrow$  I should withdraw

It is an equilibrium for everybody to withdraw

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## Bank Run

Not clear whether we really should worry about bank runs on solvent banks.

However, the value of assets is endogenous  $\Rightarrow$  turbulent times increase chance of bank run which lowers the value of a bank's assets which makes the bank insolvent

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## Fragility of Banks

### Summary

Well, ...

banks are fragile

trust not only in banks itself but in the monetary  
authorities are key.

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## III.4 Regulation

1. Deposit Insurance
2. Basel Accords and Capital Requirements

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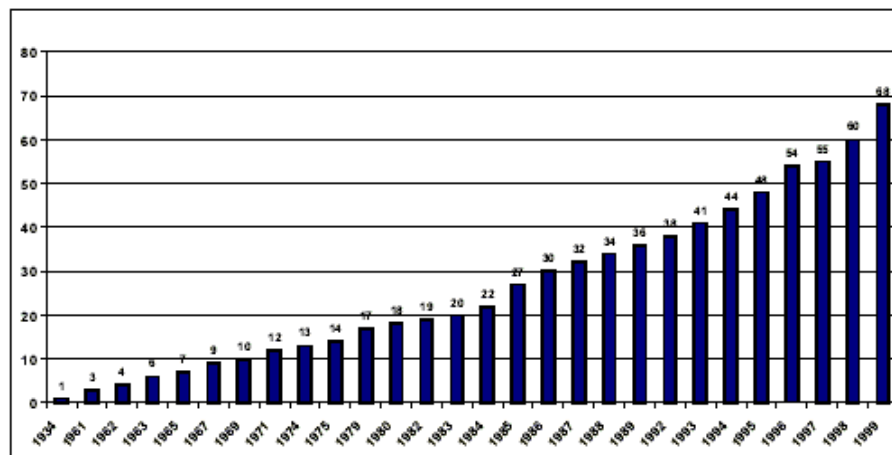
## Deposit Insurance

- 1934: the US became the first country with nationwide deposit insurance
- 1980: 16 countries had deposit insurance
- Banking crises of the 80's and 90's ⇒ explosion of deposit insurance

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## Deposit Insurance

Number of Explicit Deposit Insurance Schemes in the World



Source : Demirgüç-Kunt and Sobaci (2000).

## Deposit Insurance

- Motivation for deposit insurance is the fear of bank runs.
- However, Demirguç-Kunt and Detragiacle (2000) analyze 61 countries over the period from 1980 to 1997 and show that countries with insurance were more likely to have a banking crisis.
- This does not necessarily imply that the chance of a crisis increases if a country implements deposit insurance. Why?

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## Moral Hazard & Deposit Insurance

- As with other firms with limited liability there is an incentive to take on risk
- Worse for banks because unlike lenders to regular firms, depositors are insured and don't have an incentive to monitor banks
- Savings and Loan (S&L) crisis is a good example

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## S&L Debacle

- Early 80's interest rates increased
- Profits dropped since existing rates on long-term fixed-rate mortgages did not
- Value of assets dropped  $\Rightarrow$  net worth  $\downarrow$
- Deregulation allowed S&L's to expand beyond mortgages into riskier opportunities
- Increased competition pushed up deposit rates even further and made mortgage lending not very profitable
- Increased competition also reduced the value of a bank charter

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## S&L Debacle

- Limited liability and limited oversight made risk taking attractive for the owner
- Since the banking industry was shrinking managers were tempted to expand by taking on not so profitable risky projects
- Owners have limited control on bank managers

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## Market Control on Bank Managers

Fraction of times corporate control changed after certain events

	Manufacturing Firms	Bank Holding Companies
Hostile Takeover	8.8%	1.7%
Management Turnover	20.5%	10.2%
Friendly Merger	7.5% <sub>+</sub>	10.7% <sub>+</sub>
Market-Based Change	36.8%	22.6%
Regulatory Invention	0% <sub>+</sub>	14.1% <sub>+</sub>
Total	36.8%	36.7%

Gorton and Winton (2002)

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## Famous S&L example

- Lincoln Savings in Irvine California
- Bought by Charles Keating in 1984, who had been accused of fraud by the SEC
- Keating fired moderate loan officers and immediately rushed into high-risk investments including junk bonds & currency futures
- Regulators realized problems early
- Keating donated \$1.3 million to five U.S. senators, the Keating Five, who ensured regulatory leniency
- The failure costs U.S. tax payers \$2.5 billion

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ESTIMATED TRANSFER COST OF SELECTED BANKING CRISES <sup>7</sup>		
Country	Period	Estimated Cost / GDP (Percent)
United States	1980s	2.5
Japan	1990s	20.0p
Norway	1987-89	4.0
Spain	1977-85	16.8
Sweden	1991	6.4
Bulgaria	1990s	14/0
Hungary	1991-95	10.0
Israel	1977-83	30.0
Mexico	1990s	12-15
Argentina	1980-82	55.3
Argentina	1989-90	13.0
Brazil	1994-1995	5-10
Chile	1981-83	41.2
Uruguay	1981-84	24.2
Venezuela	1994-95	18.0
Turkey	1982-85	2.5
Finland	1991-94	8.4
Korea	199x	60.0p
Indonesia	199x	80.0p
Thailand	199x	45.0p
Malaysia	199x	45.0p

Includes all depository institutions, costs are to governments and depositors  
p Preliminary

Sources: Caprio Jr. and Klingebiel, Lindgren, Garcia and Saal; Rojas-Suarez and Weisbrod; Wall Street Journal, October 22, 1998 and July 27, 1999

## Consequence of S&L Debacle and Other Banking Crises

London  
Business  
School

1. Thinking about how to measure downward risk
2. Capital Regulation and the Basel Accords

### Historical Capital-Asset Ratios

- Before 1850: 50%
- 1929: 14%
- 1945: 6%
- 1986: 6%

## How to Measure Risk? Variance

Problem with the variance is that it doesn't very well capture downward potential

Example 1: with probability 0.95 value is \$0.9 million  
with probability 0.05 value is \$2.9 million

Example 2: with probability 0.95 value is \$1.1 million  
with probability 0.05 value is ~~-\$0.9~~ million

Same expected value and same variance

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## How to Measure Risk? Value at Risk (VaR)

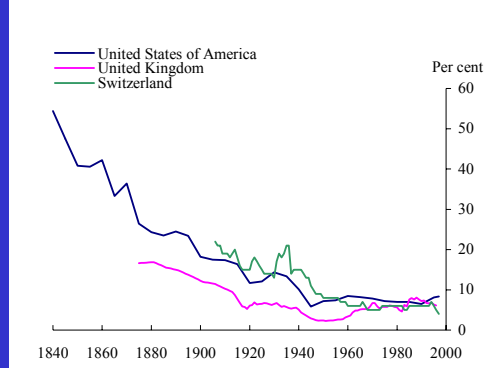
If the 1% VaR is \$X then the value of this investment will be less than \$X with less 1% probability

VaR can also be expressed as return (if the probability that the realized return is less than -5% is 1% then the 1% VaR is -5%)

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## Basel I followed erosion of bank capital/competitive pressures

Chart 1: Banks' equity capital as a percentage of total assets



Source: Bank of England, Federal Reserve Board and Swiss National Bank estimates. The data for each country were developed from different data sources over time, with different accompanying standards and therefore only illustrate long-run trends.

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## 1988 Basel Accord

London  
Business  
School

Named after the Basel (or Basle) committee of the Bank of International Settlements

Negotiations started with the G10 but more than 100 countries have implemented Basel I and several have joined the discussions on Basel II

More info at: <http://www.bis.org/publ/bcbsca.htm>

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## 1988 Basel Accord

Core Capital / Credit Risk > 4%

Total Capital / Credit Risk > 8%

Core Capital: Historical value of outstanding stock plus retained earnings

Total Capital: Core Capital + loan-loss reserves + subordinated debt

Credit Risk:  $\sum \text{asset} * \text{risk weight}$

For example, risk weight of government security is equal to 0 and risk weight of corporate loan is 1.

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## The Basel I Capital Adequacy Standards

<i>RISK-WEIGHTED ASSET CATEGORIES</i>	
0% risk category	Cash, Federal Reserve Bank Balances Securities of the US Treasury, OECD governments and some US agencies
20% risk category	Cash items in the process of collection. US and OECD interbank deposits and guaranteed claims. Some non-OECD bank and government deposits and securities. General Obligation municipal bonds Some mortgage-backed securities Claims collateralized by the US Treasury and some other government securities.
50% risk category	Loans fully secured by first liens on 1-4 family residential properties Other (revenue) municipal bonds
100% risk category	All other on—balance sheet assets not listed above including loans to private entities and individuals, some claims on non-OECD governments and banks, real assets, and investments in subsidiaries
<i>CAPITAL CATEGORIES</i>	
Tier 1	Common equity, Some preferred stock, Minority interest in consolidated subsidiaries less goodwill.
Tier 2	Loan loss reserve (limited to 1.25% of risk weighted assets) Subordinated debt (limited to 50% of Tier 1) And other preferred and convertible stock.
<i>CAPITAL REQUIREMENTS</i>	
	Tier 1 capital must be at least 4% of risk-weighted assets
	Total capital (Tier 1 + Tier 2) must be at least 8% of risk weighted assets

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## 1996 Amendment

The 1988 accord only looked at credit risk (i.e. the chance of default) and didn't take into account of market risk, that is, the chance that changes in interest rates, exchange rates or other market prices changed the value of the portfolio.

New ratio became:

Total capital / ( credit risk + market risk)

Internal models (like VaR) could be used to assess the amount of market risk

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## Basel II proposals

### Three pillars

- I. Risk-based capital requirements
- II. Supervision
- III. Market discipline (by having more disclosure and transparency)

The plan was to finalize Basel II in 2003 and start implementing it in 2006, but ...

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## Basel II time table

- 2005 – Quantitative Impact Studies in some countries.
- January 2006 – Parallel running starts with current Accord/impact studies. Recalibration.
- January 2007 – Implementation date, Standardized, Foundation IRB. Further parallel running advanced IRB.
- January 2008 – Implementation date for advanced IRB.

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## Pillar I: Risk-Based Capital Requirements

Total capital / ( credit risk + market risk + operational risk)

Two approaches to evaluate credit risk:

1. **Standardized** but more detailed risk categorization of assets (if available rating of borrower by credit rating agency should be used)
2. **IRB (Internal Risk Based)** using statistical models

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## Pillar I: Market Risk

### Two approaches to evaluate market risk:

1. Standardized
2. Internal model

## Pillar I: Operational Risk

### Three approaches to evaluate operational risk:

1. **Basic**: one indicator for a bank's total activity
2. **Standardized** different indicators for different business lines
3. **Internal model** use internal loss data to estimate risk exposure

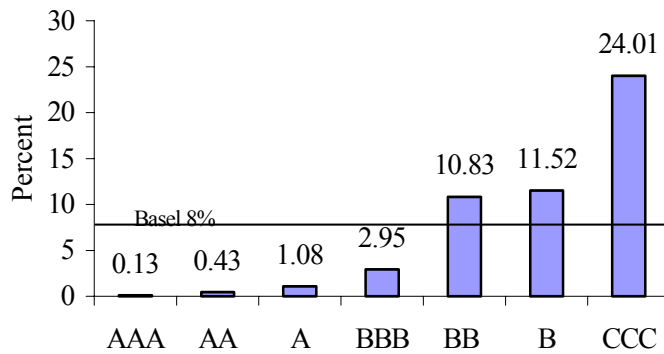
## Credit Risk Standardised Capital Requirements

	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	B+ to B-	Below B- and defaulted	Unrated
Sovereigns	0	1.6	4	8	8	12	8
Banks 1	1.6	4	8	8	8	12	8
<b>Banks 2</b>							
<Three months	1.6	1.6	1.6	4	4	12	1.6
>Three months	1.6	4	4	8	8	12	4
<b>Corporates</b>	1.6	4	8	8	12	12	8

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### no differentiation between non-bank private sector

**99.7% VARs on portfolios of exposures - using  
Creditmetrics**



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## Internal Risk Based Approach (IRB)

### IRB Foundation:

#### *Bank sets*

- probability of default (PD)

#### *Supervisor sets*

- Loss given default (LGD)
- Exposure at default (EAD)

### IRB Advanced:

*Bank sets PD, LGD, & EAD*

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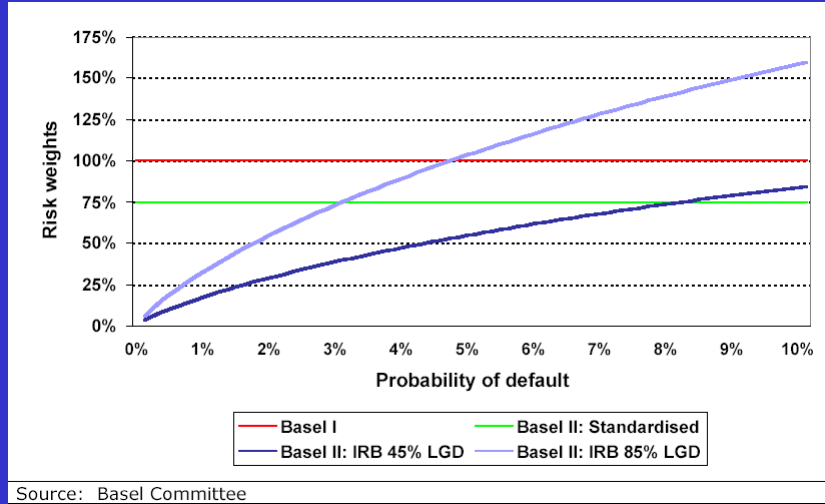
## Advantage of Internal Risk Rating Model

The standardized approach didn't take into account how bank actions like hedging through diversification and the use of derivatives affected the amount of risk the bank is exposed to.

It was widely believed that with the crude characterization of risk categories banks were shedding high-quality assets that required too much capital and added assets that were cheap in term of the capital it required.

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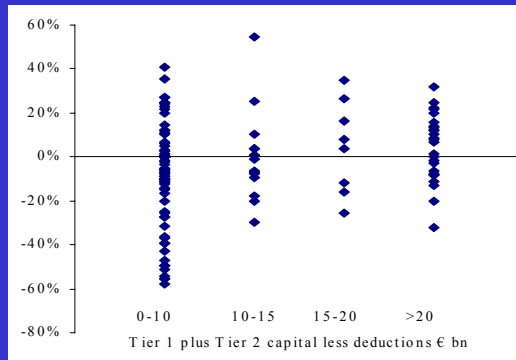
## Standardized versus IRB Credit Card Loans



Credit-card weights typically less under Basel II <sup>67</sup>

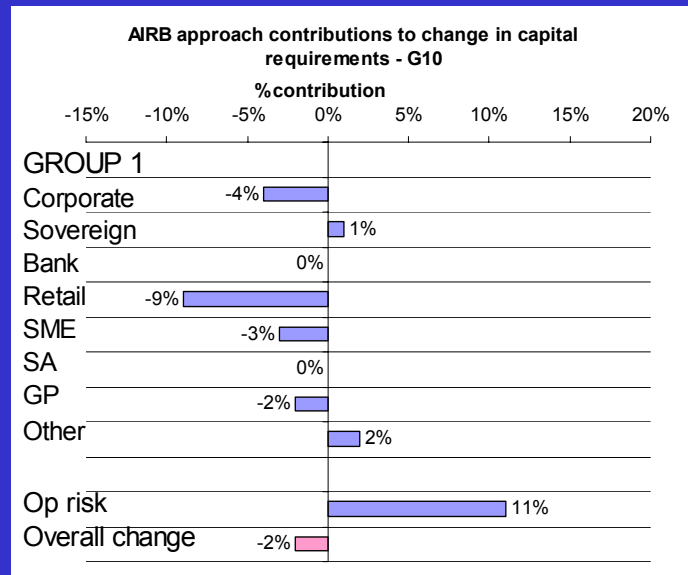
## Wide range between winners and losers

% change in Foundation IRB capital requirements – all G10 banks



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## Difference in the effect on different portfolios



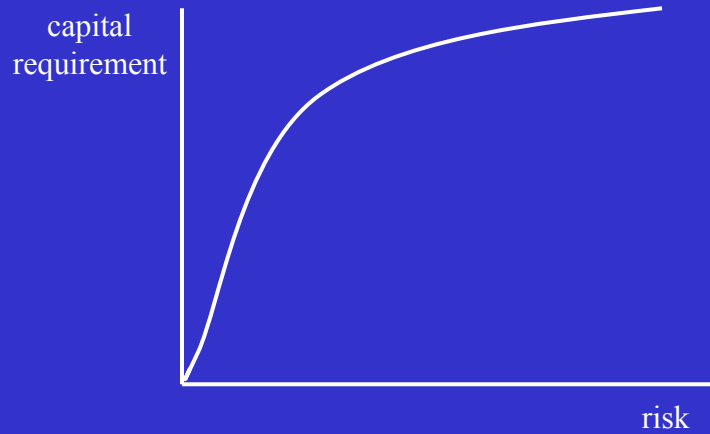
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## Pick the “cheapest” procedure?

- Standardised v IRB banks
- Will high risk lending gravitate to standardised banks?
  - pillar 2
  - pillar 1 requirement that weight on unrated bucket should be adjusted to reflect actual level of defaults

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## Capital requirements over the business cycle



What is the consequence of this picture?

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## Rating Systems

- Rating not conditioned on the point in the cycle when rating assigned – eg Moody's
- Rating conditioned on the point in the cycle when rating assigned – eg Merton which uses current liabilities

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## We focus on some representative portfolios of bank assets

	Average Quality US(%)	High Quality US(%)	High Quality European (%)	G10 estimated
AAA	3	4	-	4
AA	5	6	32	6
A	13	29	19	27
BBB	29	36	26	30
BB	35	21	18	29
B	12	3	4	4
CCC	3	1	1	1

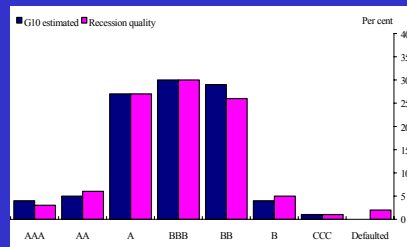
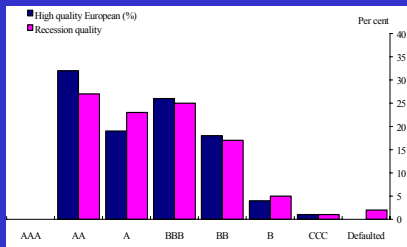
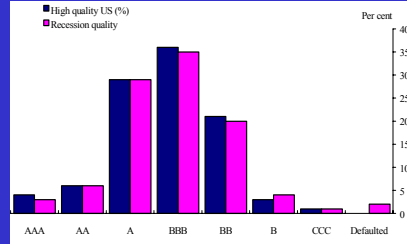
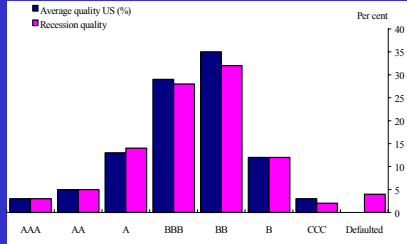
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## Transition matrix - Moody's ratings 1990-92

%	AAA	AA	A	BBB	BB	B	CCC	CC/C	Def
AAA	<b>81.41</b>	18.27	0.32	0.00	0.00	0.00	0.00	0.00	0.00
AA	0.61	<b>84.79</b>	14.36	0.24	0.00	0.00	0.00	0.00	0.00
A	0.00	0.59	<b>92.89</b>	6.19	0.33	0.00	0.00	0.00	0.00
BBB	0.00	0.14	3.97	<b>88.39</b>	6.80	0.57	0.00	0.00	0.14
BB	0.00	0.00	0.16	5.59	<b>82.45</b>	8.39	0.31	0.00	3.11
B	0.00	0.00	0.00	0.610	9.22	<b>73.16</b>	3.28	0.61	13.11
CCC	0.00	0.00	0.00	0.00	8.00	4.00	<b>36.00</b>	12.00	40.00

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## Transitions change the quality distribution - post recession



## Change in capital requirements - using 1990 - 1992 transitions of Moody's ratings

	Average Quality US	High Quality US	High Quality European	G10
<b>Including* defaulted</b>	17.9	15.2	15.3	16.0
<b>Excluding defaulted</b>	-7.0	-0.1	-1.5	-1.8

\* Largest change for lower quality portfolio.

## What would happen with a point in time rating system e.g. Merton

- Much more volatile

Transition matrix for ratings generated using Merton model

1990 to 1992

%	AAA	AA	A	BBB	BB	B	CCC	CC/C	Def
AAA	88.08	5.30	3.97	1.32	0.66	0.66	0.00	0.00	0.00
AA	41.30	17.39	19.57	8.70	8.70	4.35	0.00	0.00	0.00
A	0.00	5.00	25.00	35.00	30.00	5.00	0.00	0.00	0.00
BBB	11.11	7.41	7.41	7.41	44.44	22.22	0.00	0.00	0.00
BB	18.18	9.09	13.64	9.09	9.09	40.91	0.00	0.00	0.00
B	0.00	0.00	0.00	16.67	50.00	33.33	0.00	0.00	0.00
CCC	0.00	10.00	0.00	0.00	40.00	40.00	10.00	0.00	0.00

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## Change in capital for non-defaulted assets with Merton transition matrix

Average Quality US	High * Quality US	High Quality European	% G10
8.8	53.2	47.1	36.3

\* Largest change for high quality portfolio.

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## Action taken by the Committee

- Reduced slope of the curves - earlier steeper curves would have had much larger effect, 60% increase for G10 using Merton, not 36%.

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## Some other unknowns

- How do other elements in the calculation of capital vary across the cycle?
- LGD –evidence from bonds that recovery rates fall in recessions.
- Committee asked banks to take this into account when lending in booms.
- But not fully clear how it varies across facility and collateral types.

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## Effect on lending?

- Argued that higher capital requirements during recessions mean margins will rise
- Increase in risk may already have implied increase in margins during recession. Will increase in regulatory capital make it worse?

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## Critique of Basel II proposal

London  
Business  
School

1. Doesn't take into account that risk is endogenous and the proposed regulation may actually increase instability of the system
2. VaR is not a very good tool especially if everybody is using it
3. You would want the supervision to be flexible but not clear how this is supposed be done

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Millenium Bridge

83

People changed the way they walked in reaction to the  
movement of the bridge

...

Everyone stepped the same way at the same time

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## Endogenous Risk

- Negative Shock  $\Rightarrow$
- Perceived/measured risk  $\uparrow$  (moving up the curve)  $\Rightarrow$  required capital charge  $\uparrow$
- Banks will try to shed risky assets  $\Rightarrow$
- This will hurt the economy and risk  $\uparrow$   $\Rightarrow$
- etc.

!!! But the whole idea of a banking sector is that it will take on risk and buffer negative shocks not that it will unload risk when times get tough

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## Endogenous Risk

The problem of “endogenous risk” would be substantially less if banks could get additional capital but this is not so likely during periods of stress

Cornett and Tehranian (1994) show that the stock price reaction to a voluntary equity issuance is significantly less negative than those associated with an involuntary issuance taken to satisfy capital requirements.

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*If no one ever took risks, Michelangelo would have painted the Sistine floor."*

*- Neil Simon*

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## Examples of Endogenous Risk

- Portfolio Insurance during 1987 crash
- Selling of the dollar after 1998 Russian default
- Market participants selling short LTCM's assets

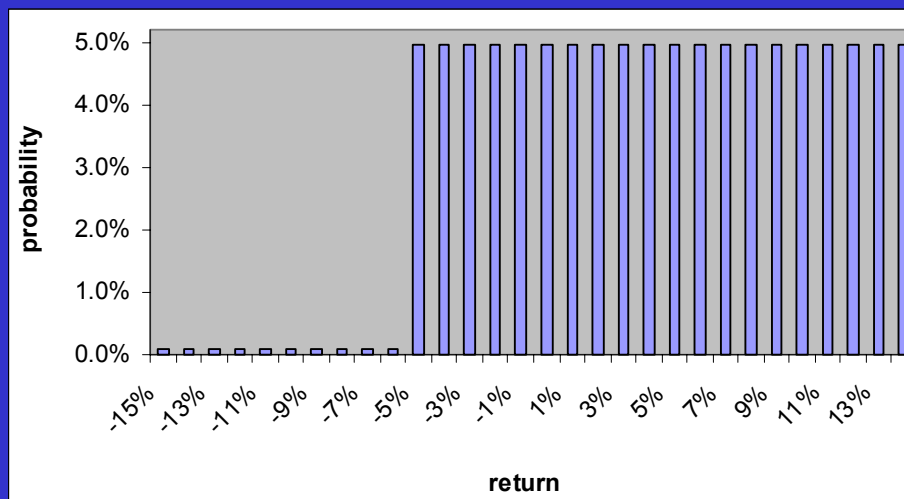
88

## Problems of VaR

1. Doesn't make clear what the tail exactly look like
2. Since tail events happen infrequently, they are really hard to estimate with empirical data
3. Historical data are likely to be misleading since the distribution might change especially during a crisis

89

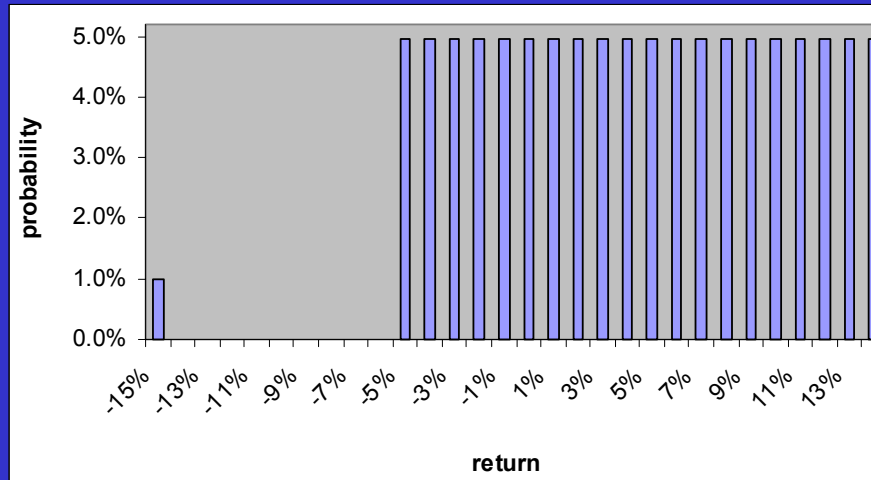
## VaR provides limited info about tail



1% VaR is -5%

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## VaR provides limited info about tail



1% VaR is still -5%

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## Discussion: Agree or Disagree

- Banks don't come close to being able to understand the systemic & market risk of their portfolios because they ignore the endogenous nature of risk
- Using outside agencies to rate the risk exposure of banks is better than letting banks provide their own estimates.
- Estimates of risk exposure depend on evaluations of past data. Especially in terms of crises, past data are no good in understand future data so empirical risk models like VaR are useless

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## More Critique of Basel II proposal

4. No guidelines on how to discipline managers
5. Proposed regulations might be more relevant for the way banks used to operate
  - In the past the main function of banks was to “warehouse” assets and it made sense to focus on the risk of the existing portfolio. These days an important function of banks is fee based and there is enormous turnover in the banks’ portfolios (e.g. because of loan sales). The value of this potential to earn fees is ignored.

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## Improvements to Basel II proposals

- Average out capital requirements over longer time periods
  - This has the advantage that banks will not adjust their portfolio too quickly
  - You can assign a penalty if banks don’t have enough capital and let the penalty increase *nonlinearly* with the time period over which capital is deficient
  - The penalty could be financial (which would hurt the shareholder) or could involve increased control on bank management by the authorities (which would be bad for the bank manager)

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## Improvements to Basel II proposals

- Focus regulations more on risk at the beginning of the transaction and provide insurance for being simply unlucky
  - Although the regulation tries to capture ex ante risk, the concern is that the internal models will follow risk on a daily basis, that is, over the life time of the investment and and make adjustments accordingly
  - Although in theory this would be desirable it is probably impossible to implement

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## Improvements to Basel II proposals

- Less emphasis on VaR and more emphasis on techniques that take into account more complete information about the distribution of returns
  - Focusing on VaR may force banks not to take on the kind of risk (tail events) we hope banks can be a buffer against

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## Improvements to Basel II proposals

- Flexible regulation. The Fed did a superb job during recent turbulent periods by relaxing regulation, providing liquidity, exerting extra supervision, and engaging in intense information gathering
  - 1987 crash
  - Russian default / LTCM crisis
  - 9-11
- During these periods the system was structurally sound. The question is whether regulators will also be able to be tough when the system does need to be “cleansed”.

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## Improvements to Basel II proposals

- Shadow Financial Regulatory Committee:
  - Measure and disclose bank capital in market value
  - No weights but higher capital requirement
  - Structured system for early intervention
  - Part of capital must be subordinated debt
- Advantage of subordinated-debt requirement:
  - Since the holders don't benefit from upward potential of risk they have incentive to monitor closely
  - Issuing subordinated debt will be expensive for unsafe banks

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## Improvements to Basel II proposals

- No regulation (other than requiring more detailed information about banks' actions and investment returns? That is no capital requirements and no deposit insurance. Just let the market discipline banks. There really haven't been that many bank runs.

## Regulations

### Summary

- Fragility of banks led to deposit insurance
- Deposit insurance led to S&L
- S&L led to regulation of bank equity
- Current regulation and especially proposals are likely to ignore that risk is endogenous
- Basle II led to ... etc