

# Bankers Trust and the Birth of Modern Risk Management

21 May 2009

**LOAN** EXPOSURE  
MANAGEMENT GROUP



**Gene D. Guill**  
**Deutsche Bank**

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## Context: Financial services in the 1950s and early 1960s

- Economic environment: relatively stable, robust growth, low inflation, fixed exchange rates, and low interest rates
- Regulatory policies: biased toward control and protection rather than open markets and competition
- Financial services were divided into secure, insulated sectors:
  - Commercial banks – controlled most of the loan and credit business
  - Savings & loan institutions – provided savings products and mortgages
  - Investment banks – held a virtual monopoly on underwriting and placement of securities
  - Insurance companies – offered products to manage specific classes of risk



## Commercial banking was a relatively simple business

- Primary intermediary between savers & borrowers
- Made money on the spread between interest rates paid for deposits and interest rates charged for loans
- Relied on standardized products; innovation was infrequent

U.S. Money Center Banks 1950			
Assets		Liabilities	
Cash	24%	Demand Deposits	70%
US Gov't Securities	37%	Savings Deposits	22%
Other Securities	7%	Miscellaneous	2%
Business Loans	13%		
Mortgage Loans	8%		
Consumer Loans	6%		
Miscellaneous	5%	Capital	6%

*Source: FDIC Annual Report and Federal Reserve Bulletin*

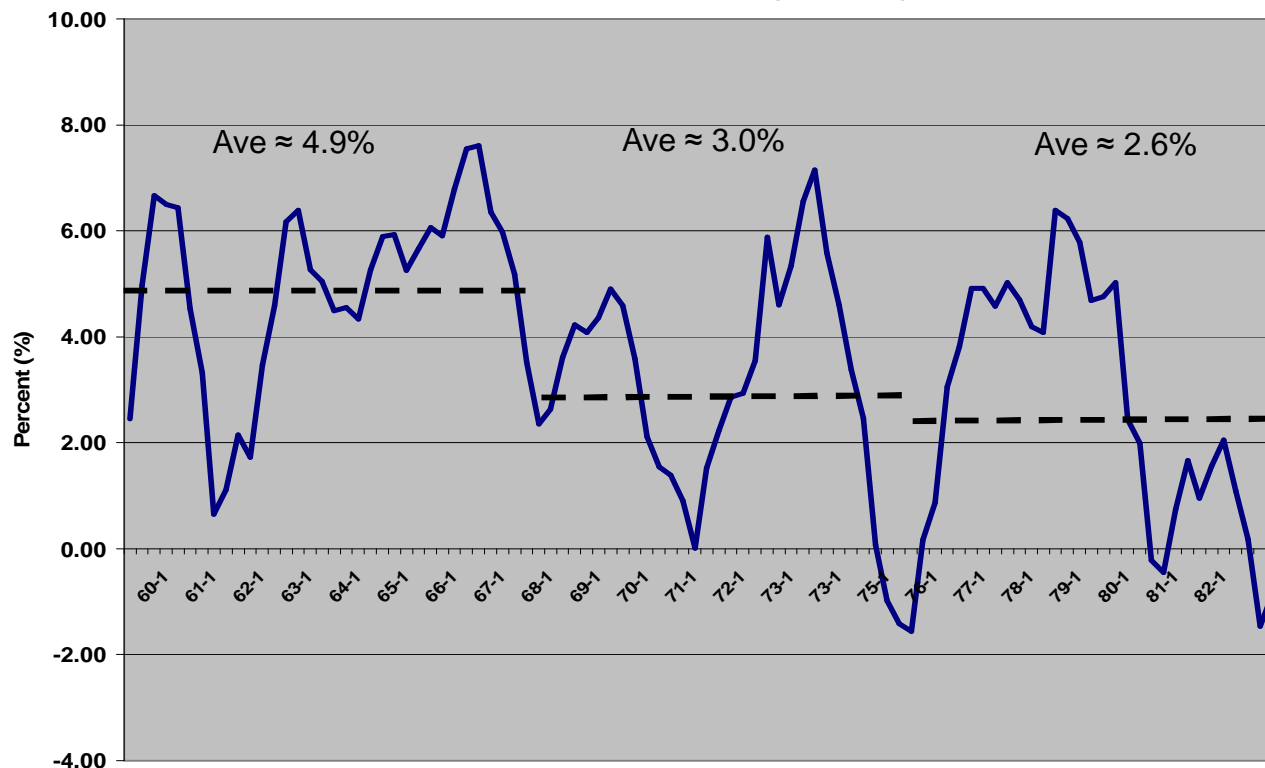


## World started to change in and around financial services in the 1960s and 1970s

### 1. Macroeconomic trends: slowing real growth . . .

Real GDP Growth

(Quarterly, 6-Qtr moving Average)

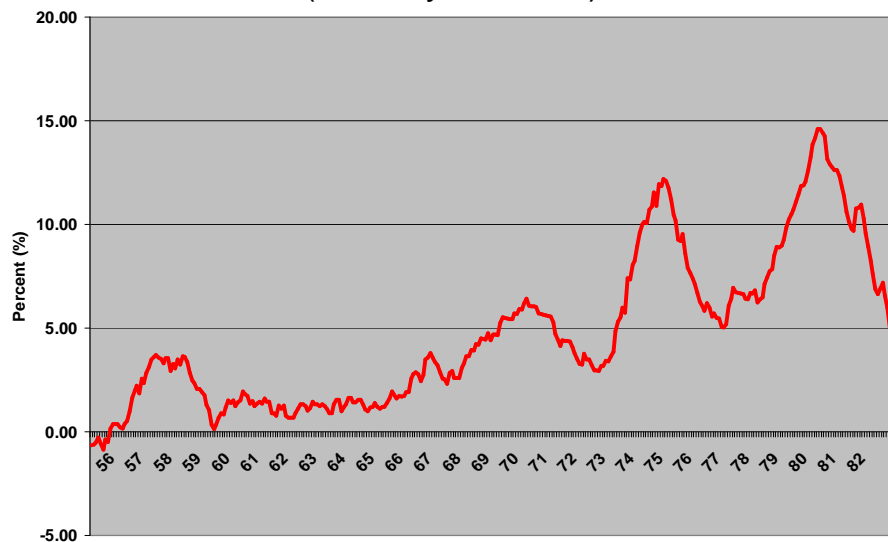




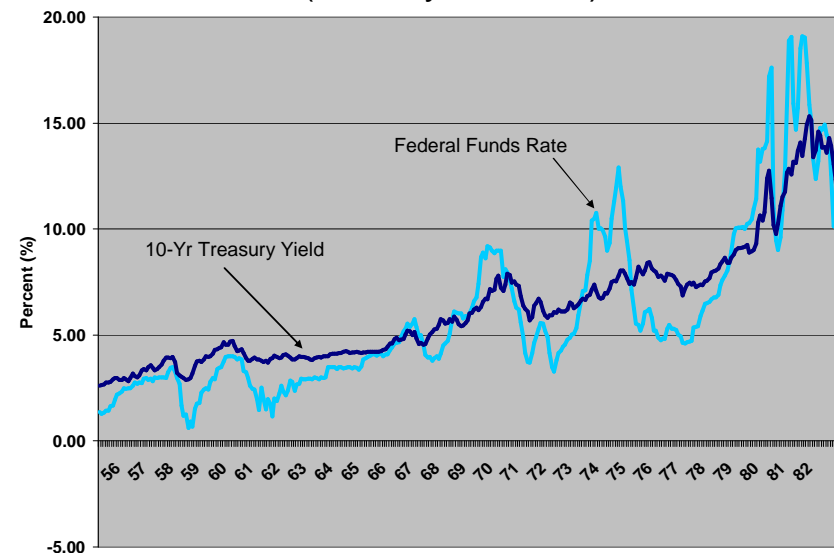
## World started to change in and around financial services in the 1960s and 1970s

1. . . . rising inflation, rising and more volatile interest rates

Consumer Price Index  
(Monthly, PCHYA)



Fed Funds Rate vs 10-Year Treasury Yield  
(Monthly, Percent)





## Erosion in the competitive position of commercial banks

2. Increasing competition . . . on the liabilities side of the balance sheet:
  - High interest rates led to competition from money market mutual funds
  - In 1980, Monetary Control Act 1) eliminated interest rate ceiling on deposits and stimulated competition for savings products, and 2) removed banks' competitive advantage of the lowest relative cost of funds
3. Increasing competition . . . on the assets side of the balance sheet
  - While the Monetary Control Act of 1980 deregulated liability side of the balance sheet, there was no legislation that expanded products banks were allowed to offer
  - Growth in commercial paper market and decline in demand for loans from investment grade customers
  - Enhanced disclosure of information regarding creditworthiness and growing importance of credit rating agencies
4. Globalization allowed foreign banks to enter the U.S. market and offer products that were off-limits to domestic banks
  - Lower capital standards enabled some foreign banks to undercut U.S. competitors
  - Era of fixed exchange rates ended in 1971



## Final conditions for the risk management revolution

- Increased macroeconomic volatility together with globalization and deregulation increased the importance of understanding and managing financial risk
- Advances in financial theory
  - Capital asset pricing model
  - Options pricing theory
- Advances in computer processing technology
  - Declining cost of computer processing
  - Introduction of personal computers
- Availability of computers for the front office
  - Proliferation of commercial software
  - Increasing availability of financial data



## Bankers Trust was a mediocre performer from 1974-77

*“... a lemming that nearly drowned” in the 1973-75 recession*

	BTCO	Peer Group Average
ROAA	0.31%	0.54%
ROE	9.58%	12.55%
P/E Ratio		
High	8.30	12.0
Low	4.30	5.9





## But BT had one strength: Resources Management

- In the 1970s, Resources Management was responsible for
  - Funding the bank
  - Managing the bank's investment account
  - Trading foreign exchange, government bonds, municipal bonds, other short-term financial instruments
- Revenue generated by Resources Management increased from \$20.1 million in 1977 to \$83.6 million in 1980
- *"Bankers Trust's stunning success in the securities area won it consulting work and provided solid bottom line profit." -- Business Week, April 13, 1981*
- A key to Resources Management's success was the development of a new approach to risk measurement and risk management



## Genesis of RAROC, economic capital, VaR, and risk-based capital

. . . in response to the question, the trader responded,  
*“Brought ‘em in and shot ‘em out. Didn’t make any money.”*

- Did this trader have a good day or a bad day?
- Did he pay/receive a good price or a bad price for the bonds he bought/sold?
- What is the correct way to think about the performance of the trader? Should his performance be evaluated relative to the market or against an absolute benchmark?
- What is the correct way to determine compensation for the trader?
- What is the correct way to think about the performance of the department and the bank?



## Introduction of risk into financial decision making

- Three well-established principles in modern finance, but these principles had never been integrated and applied to financial decision making:
  1. By taking a position—that is, by buying bonds—the trader brought risk into the bank and used the bank’s capital
  2. The only reason to take risk is to earn a return; furthermore, the higher the risk, the higher the expected return
  3. To justify the use of shareholders capital, the traders expectation for return must be consistent with the minimum return for similar risks required by shareholders
- Using these principles it is possible to relate individual transactions to the use of the bank’s capital and the interest of the bank’s shareholders
- Explicit introduction of risk into business decision making enables us to relate
  - Interests of the individuals who manage the bank’s capital
  - Interests of the individuals who own the bank’s capital
- Capital held to protect against large, extraordinary (unexpected) losses is called economic, or risk, capital



## Risk-adjusted return on capital (RAROC)

- By comparing return generated by a transaction to the amount of risk capital that it requires, we can calculate risk-adjusted return on capital (RAROC)

$$\text{RAROC} = \left\{ \begin{array}{l} \text{Return} \\ \div \\ \text{Economic Capital} \end{array} \right.$$

- Maximizing risk-adjusted return on capital is an operational proxy for maximizing return on shareholders' investments
- The key to the RAROC model is economic capital—an empirical measure of risk. Today, this concept is at the heart of modern risk management



## Risk-adjusted return on capital (RAROC) – example

Assume you manage three traders:

Trader John: Earned \$15.75 million for the bank trading government bonds

Trader Hillary: Earned \$29.83 million trading high-yield bonds

Trader Barack: Earned \$24.31 million trading investment grade corporate bonds

- Which trader deserves the highest incentive compensation?
- Which trader made the most productive use of the bank's capital?



## Notional returns can't be meaningfully compared, but risk-adjustment permits direct comparison

	Trader John (Gov't Bonds)	Trader Hillary (H-Y Bonds)	Trader Barack (IG Corp Bonds)
Return	15.75mn	29.83mn	24.31mn
Economic (Risk) Capital	111.15mn	151.29mn	120.67mn
RAROC (%)	14.17	19.72	23.31



## Economic or risk capital — early definition

- Maximum potential loss
  - How to define? → Daily price information
- . . . that might occur over a minimum time to exit the position
  - How to determine? → Subjective assessments gleaned from market participants
- How does economic capital differ from other definitions of capital?
  - Book capital
  - Market capital
  - Regulatory capital
  - Existing capital vs. required capital



## Take-aways for financial institutions

- Explicit introduction of risk into business decision making enables us to relate
  - interests of individuals who manage the bank's capital
  - interests of individuals who own the bank's capital
- There are several definitions of "capital"
  - Book capital
  - Market capital
  - Regulatory capital
  - Economic capital
- Economic capital is held to protect against large, unexpected losses
- Economic capital is the heart of modern risk management
- Before RAROC – if a trader bought and sold a position at the same price, it was considered he didn't lose anything
  - After RAROC – not so





## Remaining topics

Application of RAROC to lending products

Evolution of the RAROC model

Incorporating RAROC into the business and culture of Bankers Trust

Innovation risk and reputation risk

Financial performance and legacy of Bankers Trust: 1986-95



## Application of RAROC to credit risk of lending products

Suppose your bank extends the following loan . . .

Borrower:	Corrosion, Inc.
Credit Rating:	BBB+
Committed Limit:	\$300 million
Expected Utilization:	100%
Term to Maturity:	5 years
Spread:	L + 23 bps

- What is the risk-adjusted return on this loan?
- What is the
  - Maximum potential loss
  - . . . that might occur over a minimum time to exit the position?



## How might the RAROC model be extended to credit risk – i.e. , lending products?

- One problem is measuring maximum potential exposure
  - Concept is different in historical cost accounting and in fair value accounting
- Another problem is the historical illiquidity of loans
  - In the 1970s, we didn't think about the “minimum time to exit a loan”
- In some cases, there was market analogy between a loan and another “IOU”
  - Some corporate borrowers do issue marketable IOUs, i.e., corporate bonds
  - Can answer the same question: “What's the most we could lose over the minimum period to exit the position?”
- But many corporate borrowers don't issue IOUs
- Banks can't exit some product exposures without ending customer relationships
  - Revolving credit lines (commitments)
  - Letters of credit



## Application of RAROC to lending products

- Obstacles that had to be addressed:
  - Accounting practices and rules
  - Illiquidity; absence of market prices
  - Regulatory views and practices
  - Corporate culture and politics
- Approach taken:
  - Rely on credit officers to provide an internal rating to all borrowers/obligors
  - Use observable volatility of corporate bond spreads to infer the volatility of corporate loans with the same rating
  - Calculate risk capital on the basis of risk amount (loan equivalent amount), credit duration, and price volatility of the borrower's rating category
- Approach was revolutionary; heretical to some
  - Avoided fair valuing loans; translated credit risk into market risk and calculated risk capital based on a standard market risk approach
  - Enabled BT to compare the risk of lending products to trading products

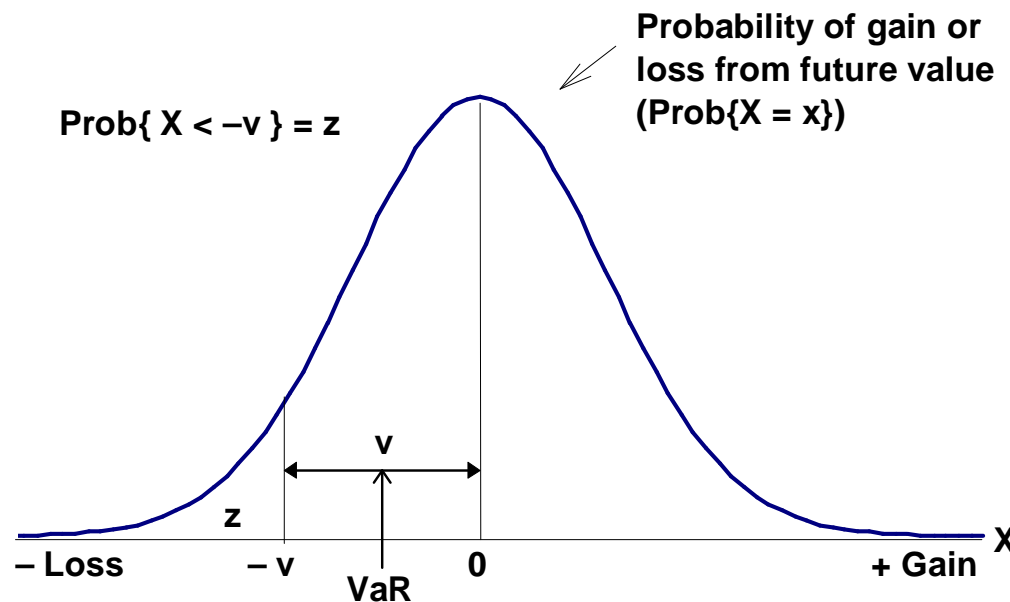




## Evolution of the risk capital methodology – definition of risk

- Shift from historical (non-parametric) to distribution-based (parametric) approach
  - Redefine risk as maximum loss that might be expected to occur 1) over a defined period, and 2) at a specified confidence interval
  - Incorporate correlations
  - Approach now widely known as VaR; BT developed and adopted it in late 1970s

### VaR for a Normal Distribution

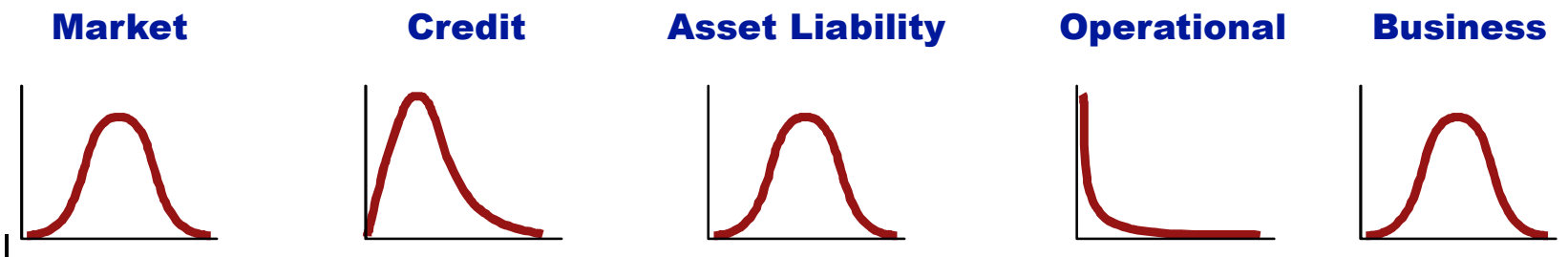




## Application of economic capital to other categories of risk

Market, Credit, Asset-Liability, Operational, Business-Event

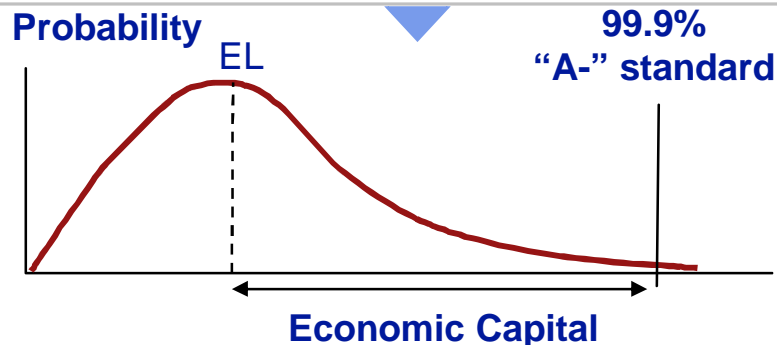
- Estimation of aggregation of these risks to determine the total loss distribution for the bank
- Sizing of economic capital to be consistent with the desired credit rating



Inter-risk correlations



Risk Aggregation





## Evolution of the risk capital methodology – capital adequacy

- “Risk capital” was perceived as a promising approach for regulatory capital standards, but faced competing requirements:
  - Comprehensive
  - Simple to implement
- Basel Accord (1988) accepted the general concept of risk capital, but differed from Bankers Trusts practices in two significant ways:
  1. Calculation of capital for lending products did not consider differential risk factors for different obligor credit ratings
  2. Market risk capital was omitted for fear it was “too complex”
- *“All major banks today use some variant of RAROC and economic capital in their business. No bank that has ever adopted RAROC and economic capital has ever dismantled it.” -- John Drzik, Oliver Wyman*

\* These differences were eliminated over time. Market risk was incorporated into the Accord in January 1996. Differentiated risk factors for credit risk were introduced as part of Basel (2007).



## Application of RAROC in Bankers Trust

### RAROC as competitive tool and guide evolution of the firm

- Corporate lending
  - Generated low returns; poor use of the bank’s capital
  - Move from “buy and hold” model of lending to “underwrite and distribute”
  - Loan sales and the development of secondary loan market
  - Developed leveraged loan business
  - Largest underwriter of loans for leveraged buy-out financing although it had less capital than its largest competitors
  - Reduced lending to investment grade customers—i.e., commitments, letters of credit
  - Pioneer in loan portfolio management





## RAROC as a competitive tool

- From “back office” processing to PROFITCo
  - Application of RAROC required that revenue be attributed to specific risks; suggested that transaction processing be organized as a separate business unit
  - Traditionally, “back office” processing was an appendage to lending relationships
  - In 1985, Bankers Trust brought all client processing activities into one business unit and created PROFITCo
  - Gave managers control over cost, pricing product design, and delivery
  - Made the “back office” into a business
  - Encouraged oversight of operational risk and settlement risk
  - Required that loan officers re-conceptualize their jobs – from “relationship managers” to “underwriters”



## RAROC as a competitive tool

- Capital management
  - Using RAROC, Bankers Trust assessed the risk-adjusted performance of all existing business units new business proposals
  - Redeployed capital from businesses that earn low risk-adjusted returns to businesses that earn high risk-adjusted returns
- Architect of the modern use of derivatives
  - No product fit BT's overall strategy better than derivatives
  - First application of modern derivatives was in managing interest rate risk
  - Movement from "back-to-back" transactions to risk managing an aggregate book
  - Other derivative products pioneered by Bankers Trust: "exotic" options, equity derivatives, commodity derivatives, insurance derivatives, credit derivatives



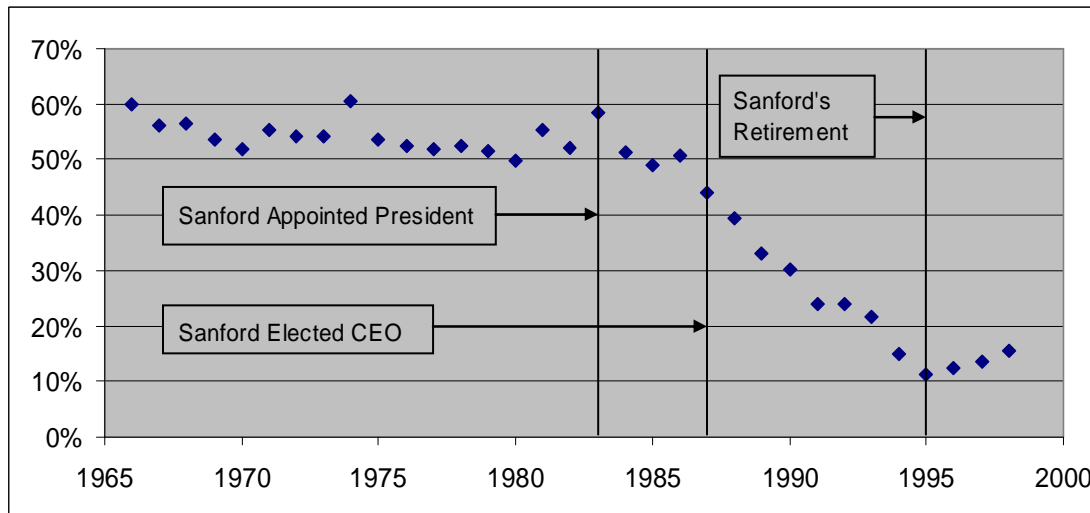
## Innovation & reputation risk

- Innovation is engine that drives economic growth and accumulation of wealth
  - Innovation carries great return for the innovating firm; it also carries great risk
  - Innovation risk arises from the same characteristic that creates reward for the innovating firm – the newness of the innovation
- Bankers Trust encountered innovation risk in its leveraged derivatives business in the mid-1990s
- Customer complaints led to an 18-month investigation by an independent counsel
  - *“Bankers Trust, as an institution, never acted in reckless disregard of any of its duties”*
  - *“. . . certain individuals [engaged] in conduct that the independent counsel found to warrant severe criticism*
- Bankers Trust agreed to pay \$10 million for the actions of these individuals without the institution admitting or denying guilt

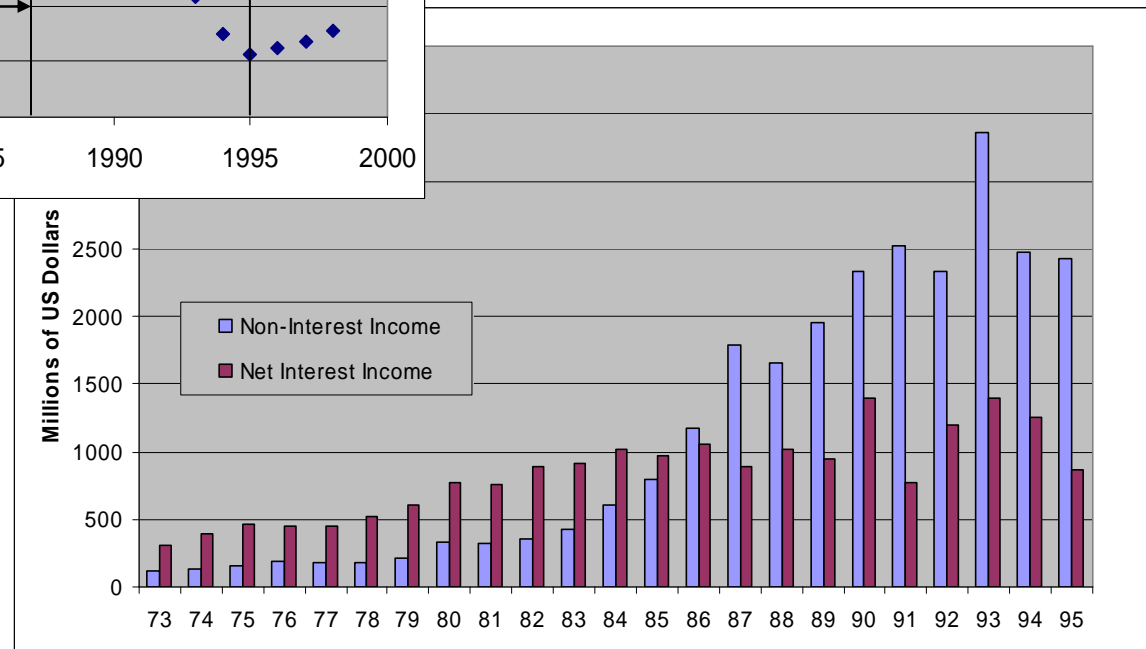


## BT shifted capital from low RAROC to high RAROC activities

Loans as a Percentage of Total Assets: 1966-98



Noninterest Income vs. Net Interest Income: 1973-95



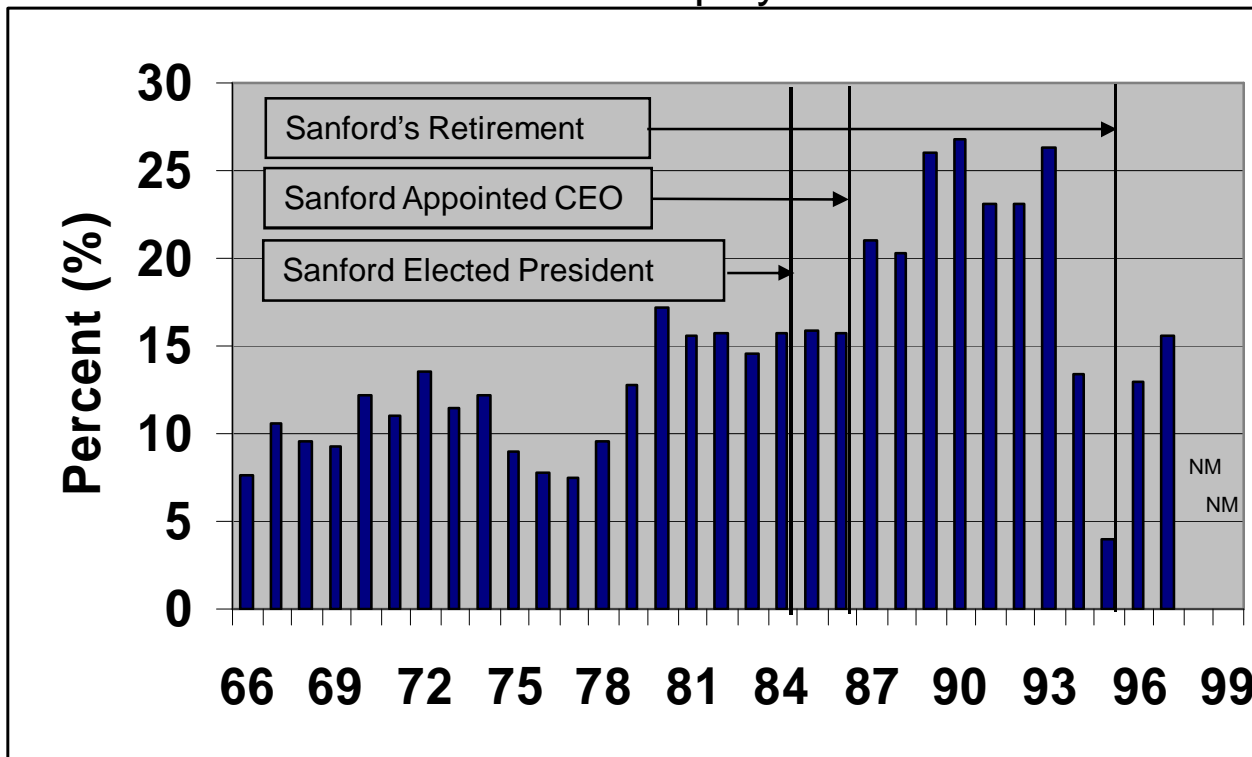
“A whole new way to run a bank”  
-- Carol Loomis  
*Fortune*  
Sept. 7, 1992





## Bankers Trust's financial performance

After-Tax Return on Equity: 1966-99



Note: The figures presented in this graph exclude the \$2.34 billion charge-offs for LDC loans that were recognized 1987 and 1989. The timing of these charge-offs was determined in coordination with U.S. regulators. These losses are more appropriately considered in the context of the period leading up to and immediately following 1982 when these loans became non-performing.

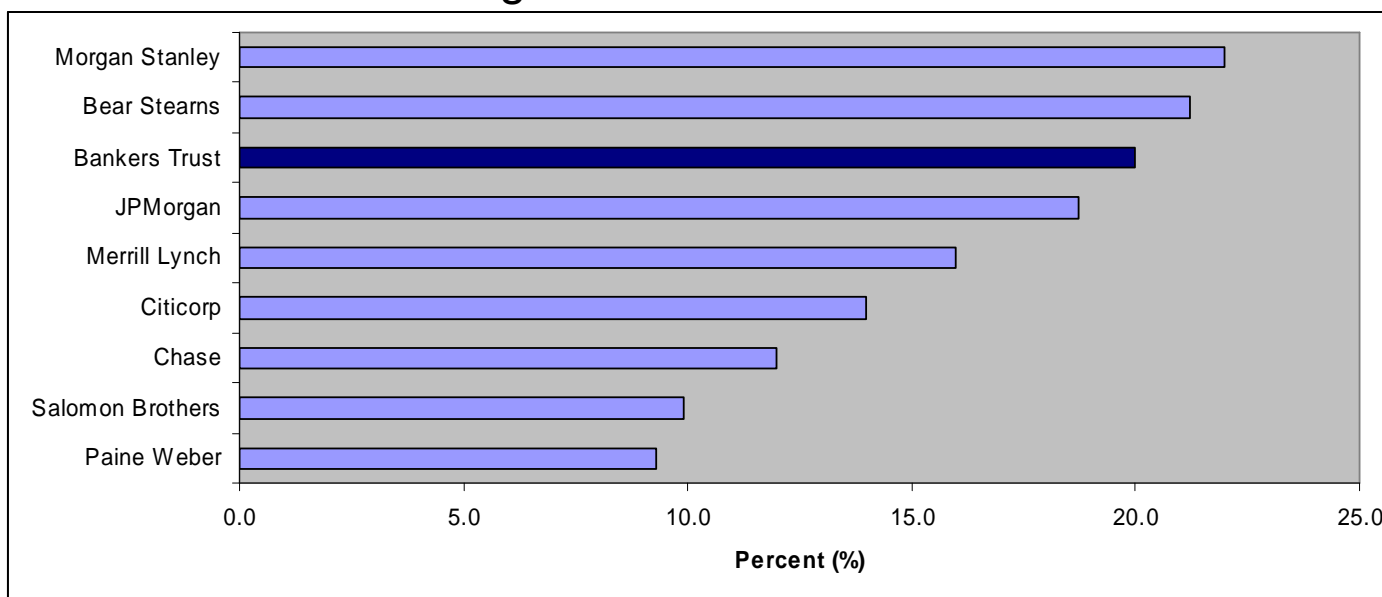


## Competitive longer term returns: 1986-95

**Risk management is as much an offensive tool as a defensive tool**

- BCo averaged 20% ROE between 1986 and 1995 – higher than any other commercial bank

Average Annual ROE: 1986-95



Notes: Before cumulative effects of accounting changes.

ROE for 1987 and 1989 normalized for significant loan loss provisions.

Source: Public Filings



## Firms that understand and manage risk have a competitive advantage

### They can . . .

- Make informed, conscious decisions to embrace or shed risk
- Establish a more accurate buffer against unexpected loss
- Charge an appropriate price for risk assumed
- Better align incentives (compensation) of those who manage the capital with the interests of those who own the capital, i.e., the shareholders
- Redeploy capital to earn higher, risk-adjusted return



## Take-aways for financial institutions

- Without risk, there is no reward – all “for profit” businesses have risk
- A risk-oriented culture requires a business model oriented to the market
- Innovation is the engine that drives economic growth and wealth accumulation in market economies
  - Innovation carries great rewards for a firm’s reputation and earnings
  - Creating a culture that supports innovation requires employees who are willing to challenge the business-as-usual mindset and always try to do things better





## Transformation of a corporate culture

- Experience of Bankers Trust between the mid 1970s and mid 1990s is often studied as an example of a successful corporate transformation
  - from a struggling, full-service bank into a dynamic, well-capitalized wholesale financial institution
  - most profitable U.S commercial bank: 1986-95
- Bankers Trusts' contributions in the development of objective, analytical tools that enabled the industry to
  - quantify and include risk in financial decision making
  - learn from the market, adapt to the market, and deliver market solutions to its customers
- These developments coincided with the deregulation of the banking industry and its transformation from a quasi-utility into a competitive business operating in open markets
- There is no single, widely accepted approach for transforming a corporation – but all agree such transformations are difficult



## Transformation of a corporate culture

. . . there is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all those who profit from the old order, and only lukewarm defenders in all those who would profit from the new order, this lukewarmness arriving partly from the fear of their adversaries, who have the laws in their favor; and partly from incredulity of mankind, who do not truly believe in anything new until they have had an actual experience in it. Thus it arises that on every opportunity for attacking the reformer, the opponents do so with the zeal of partisans, the others only defend him halfheartedly, so that between them he runs great danger.

The Prince

Niccolo Machiavelli, circa. 1505



## Example: Suppose Your Bank Has Made A Loan (Part 2)

Borrower:	Corrosion, Inc.
Credit Rating:	BBB+
Committed Limit:	\$300 million
Expected Utilization:	100%
Term to Maturity:	5 years
Spread:	L + 23 bps

- A week after this loan is booked, a credit derivatives trader offers to hedge the credit risk of the loan at a cost of 18 bps running. Ignoring issues of regulatory capital, should the bank accept the offer?



## Bankers Trust advertisements: 1990-91



Not taking risk may be  
the biggest risk of all



## Bankers Trust advertisements: 1990-91

Hide from risks and you  
hide from its rewards





## Bankers Trust advertisements: 1990-91



Risk surrounds almost  
everything worth having



## Bankers Trust advertisements: 1990-91

Every time  
money  
travels, risk  
travels  
with it





**What happened?**

**Does the current financial crisis prove risk management to be broken or fundamentally inadequate?**



# Bankers Trust and the Birth of Modern Risk Management

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## RAROC as a competitive tool

- Advocate of deregulation – leading critic of Glass-Steagall
  - Challenged Glass-Steagall and won the right to place commercial paper
  - *“Glass-Steagall is the divine right for investment bankers to make a lot of money. That is all it is.”*
  - *“. . . underwriting corporate securities is far less risky than lending. . . . No bank failure ever stemmed from underwriting securities.”*
  - Bankers Trust was among the first commercial banks to enter the corporate securities business when this activity was permitted by the Federal Reserve:
    - 1987 – permission to underwrite revenue bonds and asset-backed securities
    - 1989 – permission to underwrite corporate bonds
    - 1991 – permission to underwrite equities



## Legacy of Bankers Trust from mid-1970s to mid-1990s

- Successful transformation from a struggling, full-service bank into a dynamic, well-capitalized wholesale financial institution
- Financial performance - most profitable U.S commercial bank: 1986-95
- Leadership in transforming the banking industry from a protected, quasi-utility to a competitive business operating in free markets
- Developed objective, analytical risk management tools that enabled it to:
  - Quantify and include risk in financial decision making
  - Learn from the market, adapt to the market, and deliver market solutions to its customers
- Pioneered modern use of derivatives
- Pioneered secondary loan market; practice of loan portfolio management
- Pioneered conceptual framework for regulatory determination of minimum capital requirements



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