



Wednesday, October 27
9:00am-10:30am

901 - Finance and Risk Management

Mark Williams

Professor

Boston University School of Management

Faculty Biographies

Mark Williams

Mark T. Williams is currently executive-in-residence/lecturer in the finance and economics department at the Boston University School of Management. His major responsibility includes, course development and conducting risk management research. Current teaching responsibilities include a graduate level course in risk management as well as courses in capital markets and economic activities.

Mr. Williams is a nationally recognized risk management expert. He has worked for regulated as well as un-regulated energy companies including PG&E Corp, Citizens Power and Edison Mission Energy. Major duties have included measuring, managing and reporting of the market, credit and operational risks associated with the trading of energy commodities e.g., power, coal, oil and natural gas. Measurement responsibilities have included the development of energy forward pricing curves and the daily marking-to-market of physical as well as complicated derivative type energy contracts with lengths of up to 25 years. Prior risk management experience also includes working at the Federal Reserve Bank (San Francisco & Boston) and as a bank trust officer. In these various roles he had been responsible for pricing derivative swap transactions, evaluating mark-to-market processes, examining trust investment portfolios, credit loan portfolios, level of prudent asset allocation and overall risk/returns. While at the Federal Reserve Bank he also served as the lead trust examiner for JP Morgan-California and focused on trading, investment and off-balance sheet risk.

In addition to teaching, Mr. Williams is also engaged in risk management and investment consulting to Fortune 500 Companies as well as to large net-worth individuals.

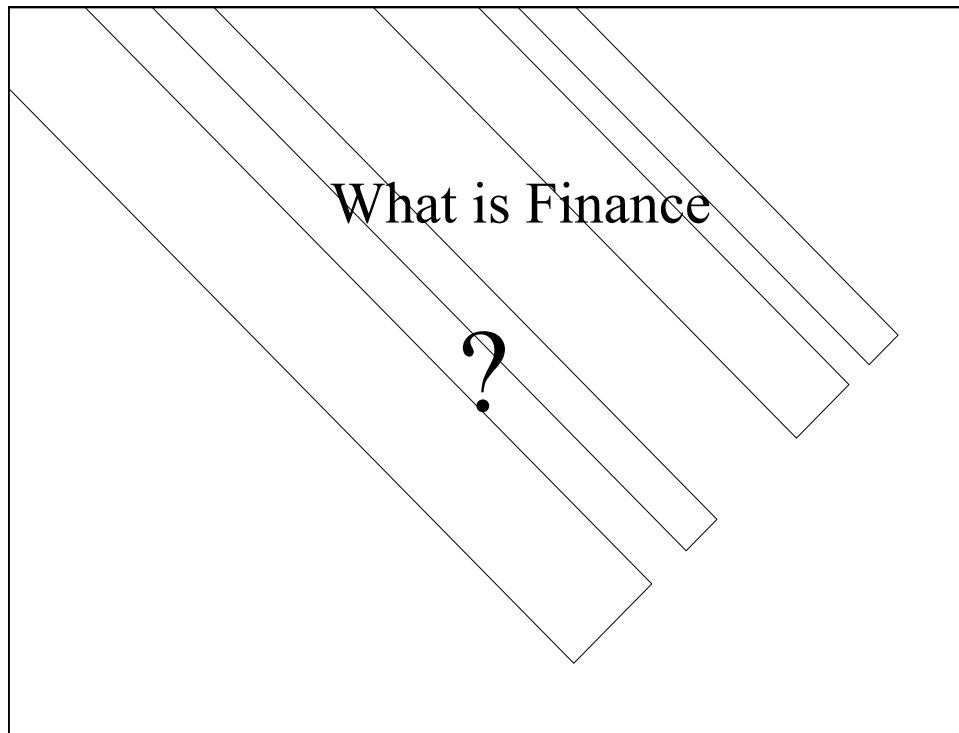
Risk Management Workshop



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Workshop Goals

- Explain seven core concepts
 1. The role of finance
 2. Finance tools and building blocks used
 3. The role of risk management
 4. Risk management tools and building blocks used
 5. Relationship between risk and return
 6. Why Lehman Brothers failed
 7. Key lessons from the fall of Lehman Brothers



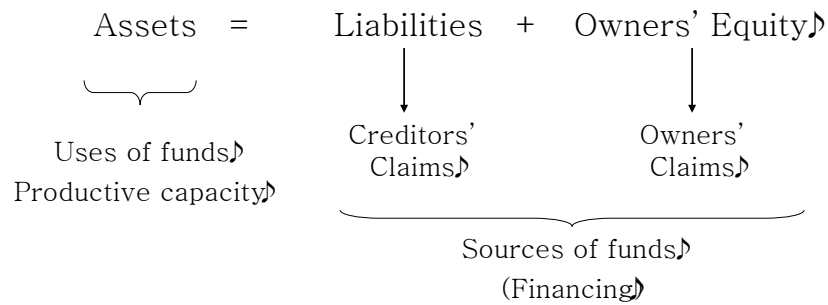
Finance

- The art and science of managing cash and other longer-term assets to make profit

The Money Machine

$$(\text{Revenue} - \text{Expenses}) = \text{Profit } \$\$ \$$$

Company Balance Sheet



Corporate Finance

- Designated department that makes financial decisions
 - Short-term – Working capital management
 - Long-term – Capital budgeting decisions
- Executives that run these areas typically hold titles of Treasurer, CFO or VP of Finance

Finance Principles

- Key terms and concepts
 1. Maximize shareholder value
 2. Financial capital
 3. Human capital
 4. Capital markets – greater than 1 year
 5. Money markets - less than 1 year

Finance Principles

- Key terms and concepts
 6. Firm capital structure (equity versus debt)
 7. Cost of capital
 8. Public/Private financing
 9. Leverage
 10. Profits

Finance Building Blocks

1. Time value of money
2. Inflation
3. Interest rates
4. Role of central banks
 - Full employment
 - Low inflation
5. Balance sheet, income and cash flow statement
6. Capital budgeting decisions
7. Cash flows
8. Net Present Value

Capital Budgeting Decisions

1. Firm value is created when finite capital is allocated to projects that produce net present value (NPV)
2. $NPV = (PV \text{ of cash flows} - \text{Investment made})$
3. If NPV is negative decline the investment

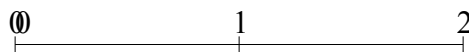
Example

- Assume you can spend \$80 today to generate \$100 in two years
- Should the project be undertaken?

Present Value of Cash Flow

Step #1

Determine how much \$100 in year 2 is worth in year 1 if interest rate is 10%?



\$90.9 ← 100

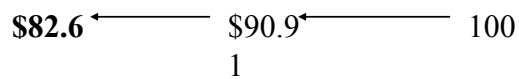
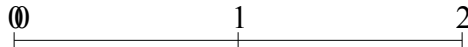
Equation:

$$100/1.10 = 90.91$$

Present Value of Cash Flow

Step #2

Calculate present value today for year 1 cash flow



Equation:

$$90.91/1.10 = 82.65$$

Net Present Value of Cash Flow

Step #3 - Calculate NPV

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PV of cash flow = \$82.65

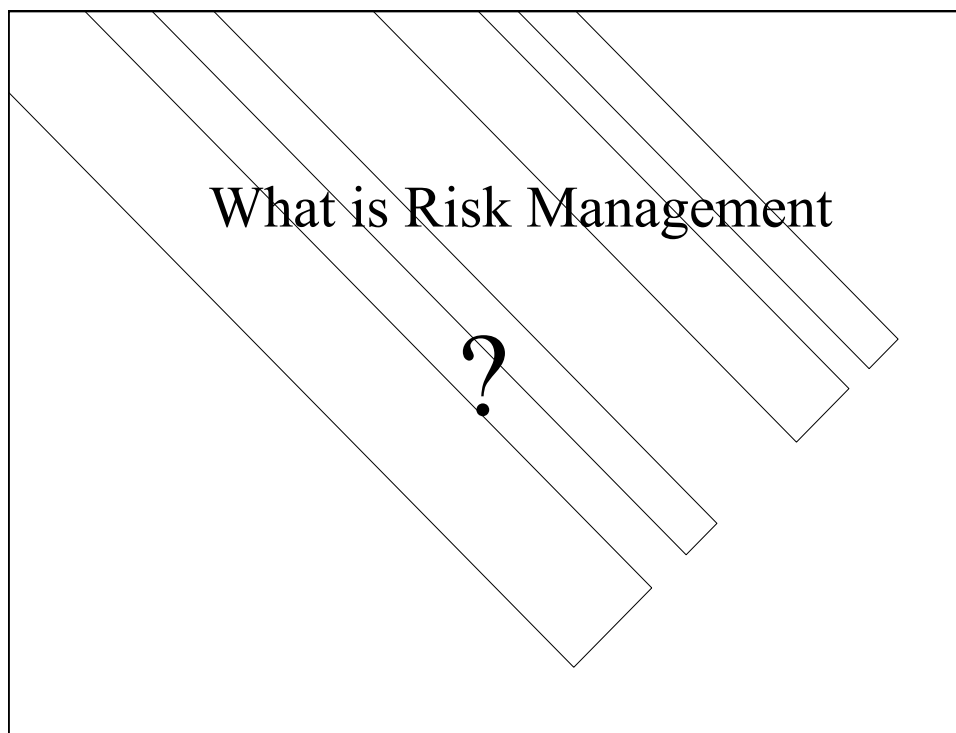
Initial Investment = \$80

NPV = \$2.65

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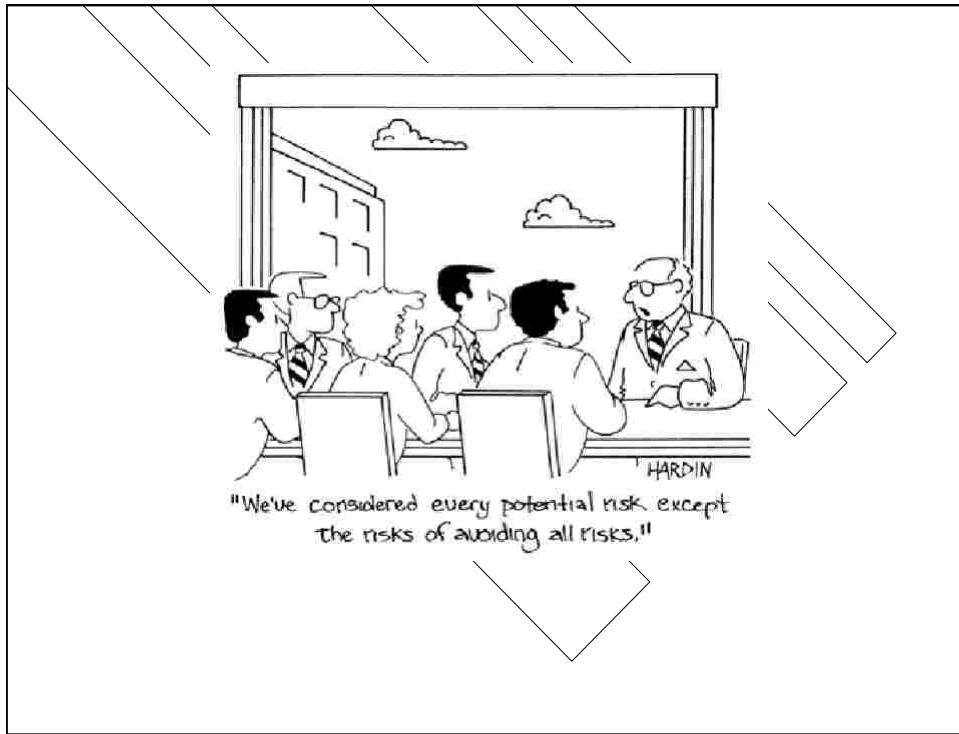
The investment creates positive NPV, firm should invest and enhance shareholder value

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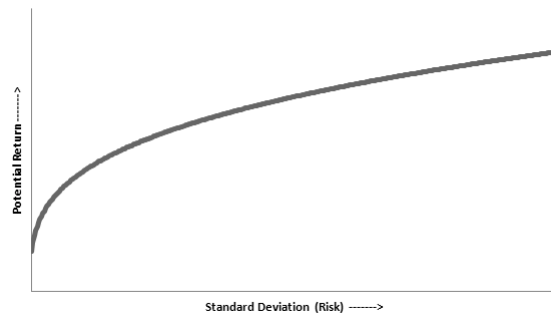


Risk Management

- Use of techniques to identify, prioritize and mitigate against undesirable risks



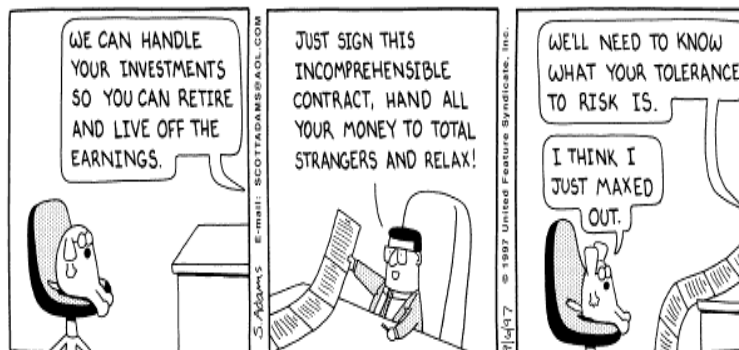
Risk and Return Relationship



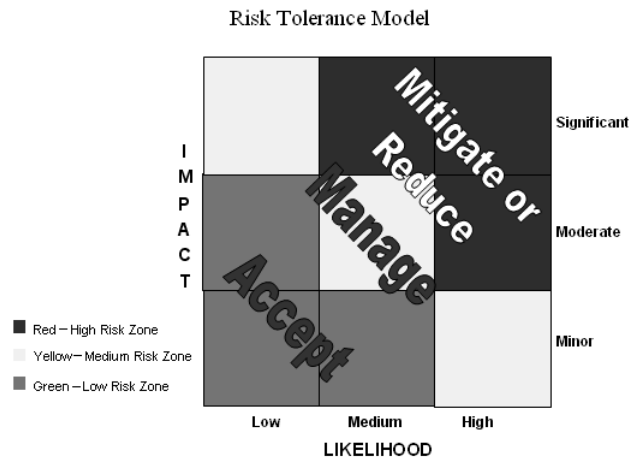
Risk & Return Relationship



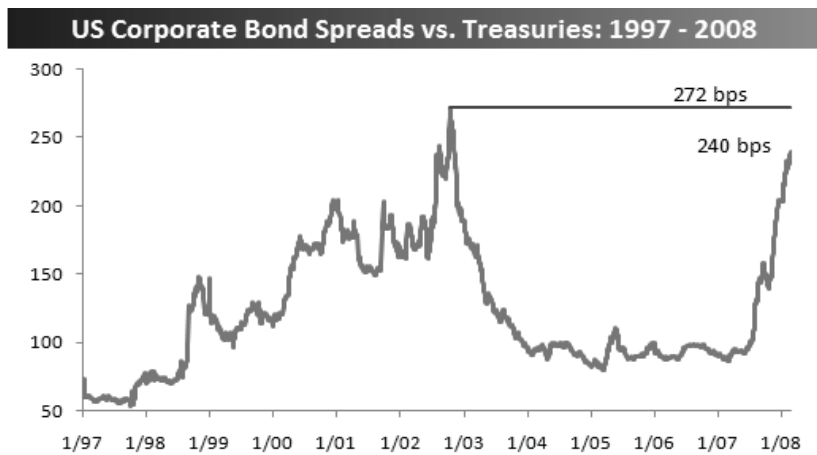
Risk Tolerance is Personal



Risk Tolerance Model



Bond Spread Analysis

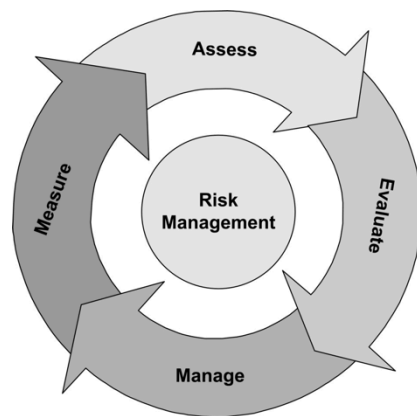


Risk Management Building Blocks

Common Risk Management Methodology

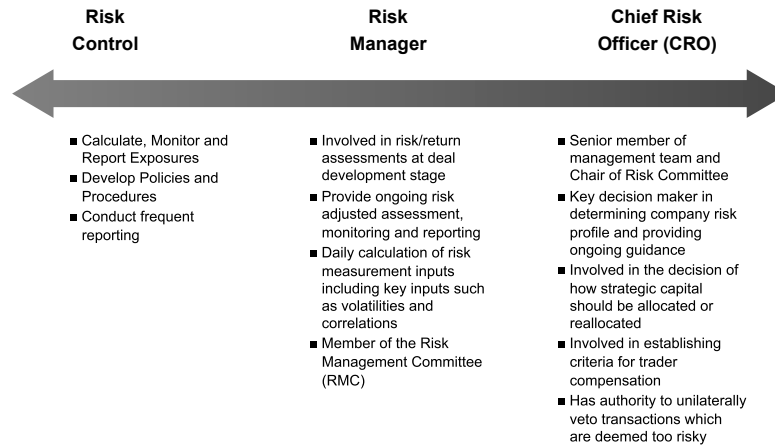
1. Define risk
2. Measure risk
3. Monitor risk
4. Report on risk

Risk Management Relationship



Risk Management Spectrum

The risk management function's can range in involvement from after-the-fact Risk Control to a very hands-on Chief Risk Officer.



Risk Management Not Industry Specific

1. Banking
2. Trading
3. Construction
4. Airline Industry
5. Biotech Industry
6. Venture Capital
7. Utility Industry
8. Insurance Industry
9. Sports & Entertainment
10. Circus Industry

Risk Management

- What types of risk(s) should companies should be concerned about?
- How many major types of risks can you think of????
 - 3, 5, 10, 12...

Risk Management

Major Types of Risks

1. Credit Risk
2. Market Rate
3. Foreign Exchange
4. Interest Rate Risk
5. Operational – error and/or fraud
6. Systemic
7. Reputation

Risk Management

Types of Risks

8. Technology
9. Funding Risk
10. Liquidity
11. Model Risk
12. Sovereign Risk
13. Acts of God
14. Legal Risk

Credit Risk Measurement



RISK MANAGEMENT OVERVIEW

S&P Rating Methodology for Industrials

I. Business Risk

- Industry characteristics
- Competitive position e.g., technology, marketing, efficiency

II. Financial Risk

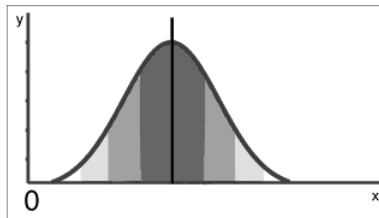
- Financial characteristics
- Financial policy
- Profitability
- Capital structure
- Cash flow protection
- Financial flexibility

Third-Party Rating Agencies

INVESTMENT GRADE		NON INVESTMENT GRADE	
S&P	MOODY'S	S&P	MOODY'S
AAA	Aaa	BB+	BA1
AA+	Aa1	BB	BA2
AA	Aa2	BB-	BA3
AA-	Aa3	B+	B1
A+	A1	B	B2
A	A2	B-	B3
A-	A3	CCC+	CAA1
BBB+	Baa1	CCC	CAA2
BBB	Baa2	CCC-	CAA3
BBB-	Baa3	CC	CA
		C	C
		D	

Market Risk Measurement

- What is standard deviation?
- How volatility used in risk measurement
- \$10 stock that has 20 percent volatility
 - \$8 or \$12
 - \$4 price swing



Risk Management Exercise

- Coin Toss



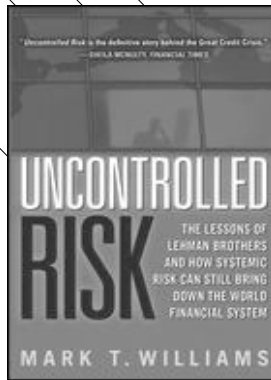
Risk Management

- Understand risk/return based on a coin toss
 - Heads – 20 % return (gain)
 - Tails – (10%) return (loss)
- Four possible outcomes – flipping a coin
 1. HH
 2. HT
 3. TH
 4. TT

Risk Management

- However, we can not determine if this is a good bet or not until we can effectively identify and measure the level of risk.
- Risk management requires estimating potential risk

Uncontrolled Risk: Lessons Learned from Lehman Brothers Fall



Lehman Brothers

R.I.P.

Born: 1850

Died: 2008





The Fall of Lehman Brothers

To understand why this event happened we need to first take a look into the past

1. Firm history
2. Regulation
3. Risk taking and how Lehman made money
4. The Role of risk management
5. Changing risk culture and firm growth
6. Bets placed and leverage used

Lehman Firm History

- Started in the Deep South
- Company evolution
 - Dry goods merchant
 - Cotton trader
 - Investment banker
 - 1994 IPO
- As America prospered so did Lehman
- The different CEO personalities

Regulation & Oversight

- US Capital Market – The Wild West
- Federal Reserve Bank established 1913
- Crash of 1929
- The Glass-Steagall Act - 1933
- Fannie & Freddie
- 1987 Alan Greenspan comes to power
- Glass-Steagall Act was repealed – 1999
- SEC?

Risk Taking

- Investment banks take risk to gain return
- Return is generated from the following activities:
 1. Proprietary trading
 2. Underwriting
 3. Advisory work e.g., mergers and acquisitions
 4. Money management

The Role of Risk Management

1. Define, measure and report on risk
2. Allocate capital to its highest and best use
3. Make sure that risk taking is not excessive
4. Enforce firm policies and procedures

Changing Risk Culture

- External factors
 - Wall Street trend of consolidation
 - Larger capital to do larger deals
 - Securitizations and derivatives
- Internal Factors
 - Stakes and financial rewards larger
 - Management focus on what drives profitability
 - Risk culture was firm not industry specific

Corporate Culture – The Gorilla



Bets Placed

- Lehman was a Hedge Fund disguised as an investment bank
- Leverage kills – ratio exceeded 30 to 1
- Bets were sizable as measured in dollars
- Bets were concentrated on Real Estate
- Lehman bet that they were “too big to fail”
- the worst case was a government rescue

Lehman's 9/15/08 Bankruptcy Uncorked Global Systemic Risk



Major Risk Management Lessons Learned

1. If you cannot quantify risk don't take it
2. Regulatory climate impacts risk taking
3. Management structure requires a strong executive team/board to challenge the boss
4. Effective risk management functions are not marginalized

Major Risk Management Lessons Learned

5. Capital size matters and leverage kills
6. Diversification is important.
7. Following competition can cause peril.
8. If you are making \$ billions it could be because you are risking \$ billions.



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