

FN241: Session 10
Corporate Risk and
Introduction to Value at Risk

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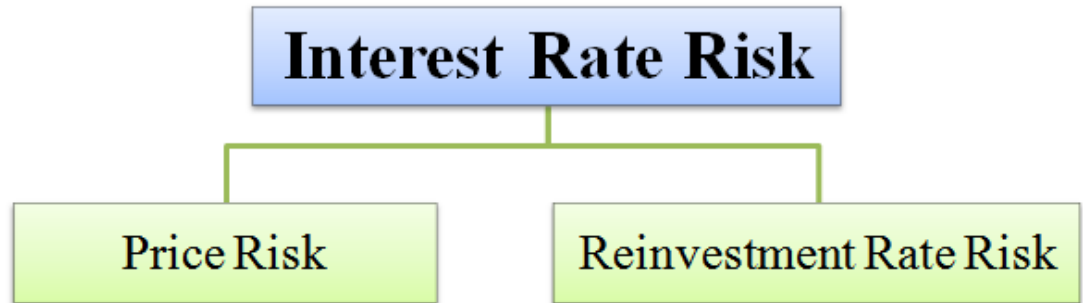
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Corporate Risk

Major Risks of Financial Intermediation

- Interest rate risk

- Mismatch in maturities of assets and liabilities.
- Balance sheet hedge via matching maturities of assets and liabilities is problematic for FIs.
- Refinancing risk.
- Reinvestment risk.



Major Risks of Financial Intermediation

- Credit Risk

- Risk that promised cash flows are not paid in full.
- Firm specific credit risk
- Systematic credit risk

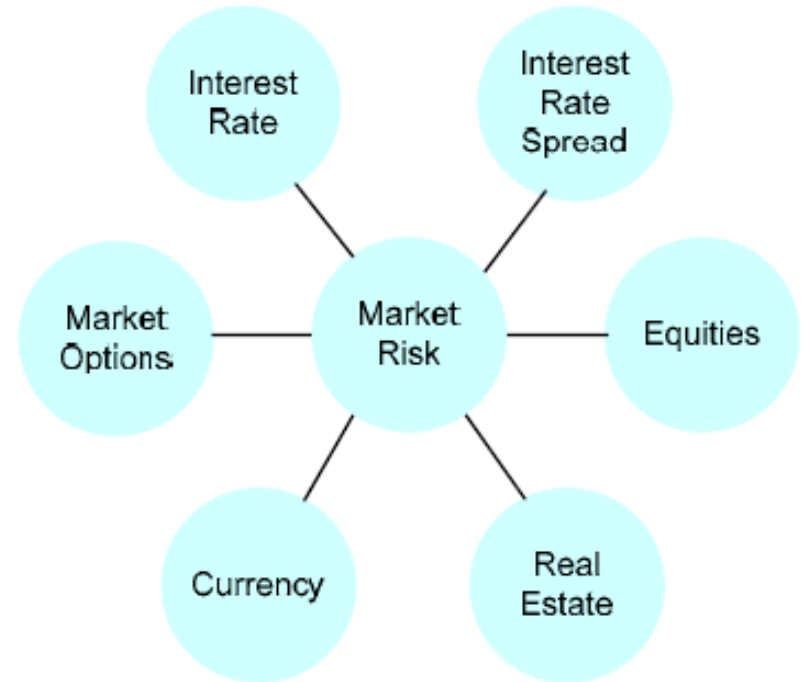
- Off-balance-sheet risk

- Letters of credit, loan commitments, derivative positions, credit default swaps (CDS) etc.

Major Risks of Financial Intermediation

- Market risk

- Incurred in trading of assets and liabilities (and derivatives).
- Examples: Barings & decline in ruble.
- Trend to greater reliance on trading income rather than traditional activities increases market exposure.



Major Risks of Financial Intermediation

- Operational and technology risk

- Risk that technology investment fails to produce anticipated cost savings.
- Risk that technology may break down.
- Economies of scale.
- Economies of scope.

Introduction to Value at Risk

The Question Being Asked in VaR

“What loss level is such that we are $X\%$ confident it will not be exceeded in N business days?”

Application: VaR and Regulatory Capital

- Regulators base the capital they require banks to keep on VaR
- The market-risk capital is k times the 10-day 99% VaR where k is at least 3.0
- Under Basel II, capital for credit risk and operational risk is based on a one-year 99.9% VaR

Advantages of VaR

- It captures an important aspect of risk in a single number
- It is easy to understand
- It asks the simple question: “How bad can things get?”

Example 1

- The gain from a portfolio during six month is normally distributed with mean \$2 million and standard deviation \$10 million
- The 1% point of the distribution of gains is $2 - 2.33 \times 10$ or – \$21.3 million
- The VaR for the portfolio with a six month time horizon and a 99% confidence level is \$21.3 million.

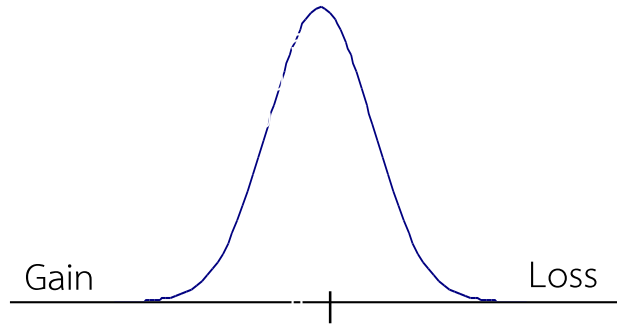
$$\text{VaR for the portfolio} = \mu - Z_{\alpha} \cdot \sigma$$

VaR Example Calculation

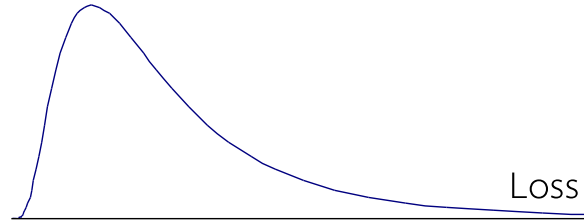
Example 2

- All outcomes between a loss of \$50 million and a gain of \$50 million are equally likely for a one-year project
- The VaR for a one-year time horizon and a 99% confidence level is \$49 million.

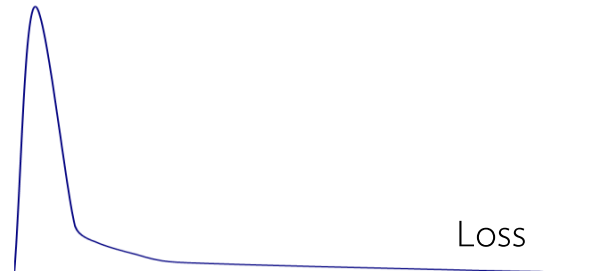
One-year Market Risk Gains/Loss Distribution



One-year Credit Risk Loss Distribution



One-year Operational Risk Loss Distribution



Characteristics of Distributions

	Second Moment (Variance)	Third Moment (Skewness)	Fourth Moment (Kurtosis)
Market Risk	High	Zero	Low
Credit Risk	Moderate	Moderate	Moderate
Operational Risk	Low	High	High

Importance of Risks

Type of Business	Most Important Risk
Commercial Banking	Credit Risk
Investment Banking & Trading	Market Risk and Credit Risk
Asset Management	Operational Risk

Question?