Chicago QWAFAFEW

Risk Management

Alternative Investments

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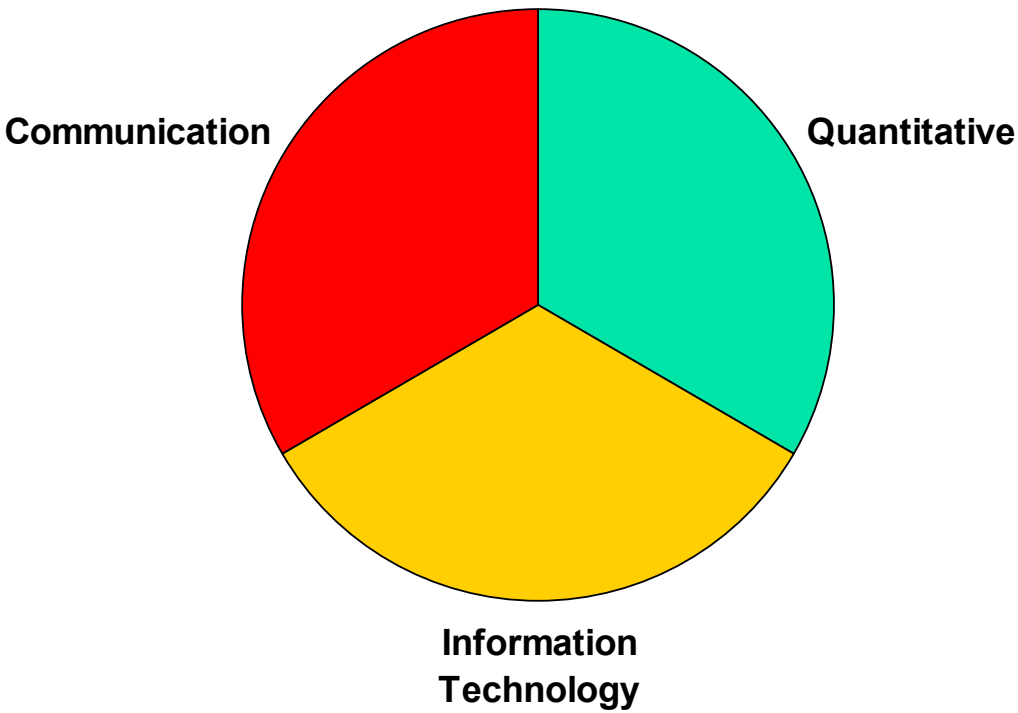
Overview of presentation

- What is Risk Management?
- Risk Management function: Large Bank versus Hedge funds
- Risk monitoring techniques

- What is Risk Management?

Experienced Risk Managers have *balanced* and *varied* skills:



- Risk Management:

  Large Bank versus Hedge Funds

Large Bank	Hedge Funds
Counterparty Credit Risk	Market Risk
Regulatory requirements	Largely unregulated
Deep pockets	Limited resources
Product specialists	Multi-asset class
Limits are comprehensive	Investment restrictions generally limited

- Risk Management:
  - Risk monitoring techniques

- Data
- Bucketing of Risk
- Stress Testing
- Value-at-Risk (VAR)

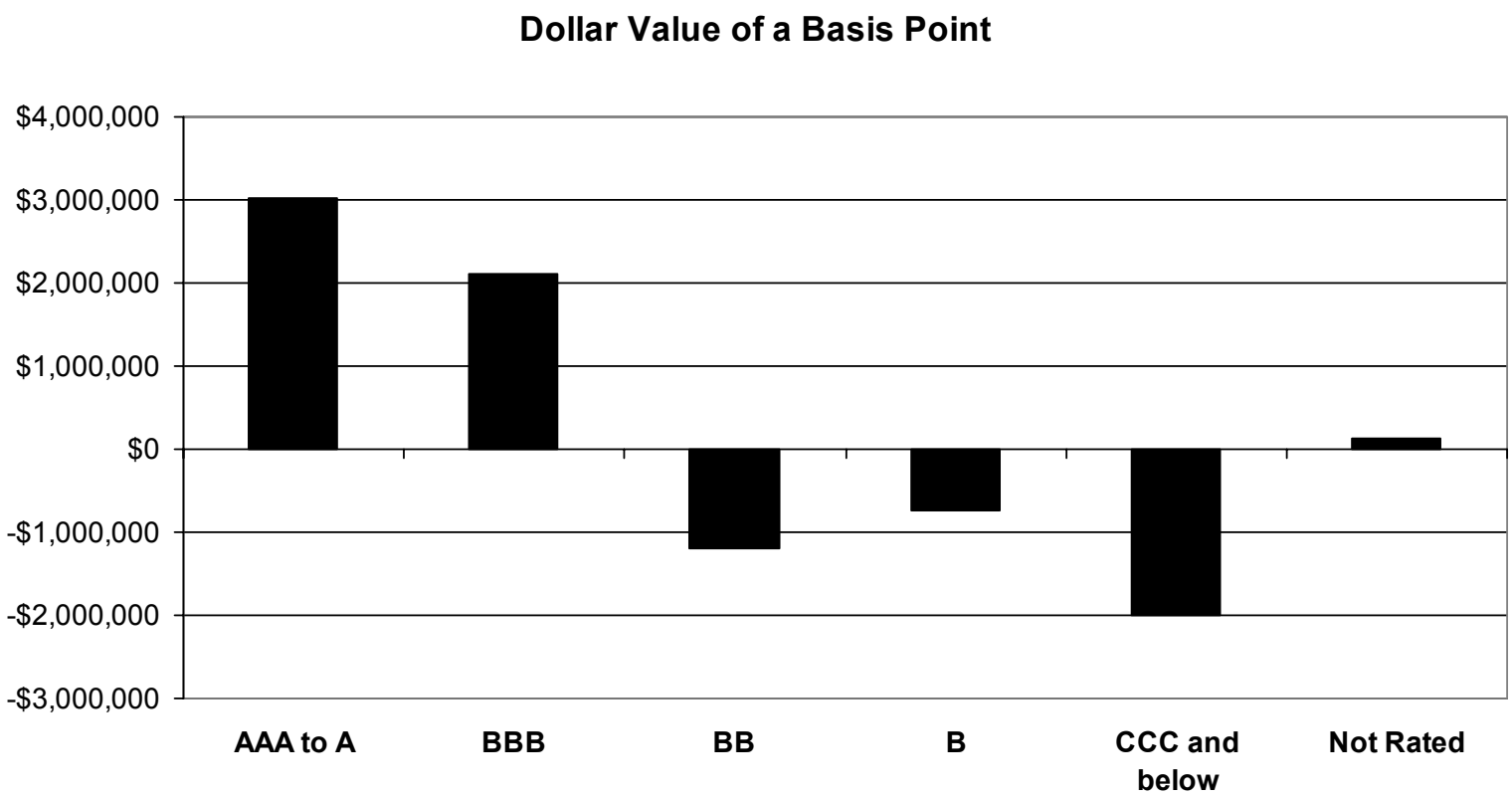
Source Data

- Position data
  - Frequency
  - Accuracy
  - Format
- Historical data
  - Is it clean? Graph it, do scatter of %, absolute changes
  - Is it representative of market? Using indices, mapping
  - Frequency

Bucketing of Risk

- Consolidate where appropriate
- Decompose into primary risk factors (eg. Delta, Gamma, Vega)
- Use charts
- Generally, risk reports greater than 1 page overwhelm and confuse

Bucketing of Risk – example (debt portfolio)



Stress Testing

- Historical
- Hypothetical
- Key vulnerabilities
- Portfolio protection

Stress Testing – Historical

- Sept 11
- LTCM credit crunch (Fall 1998)
- Nasdaq bubble 1999
- Oct 1987 stock market crash
- Mexico 95, Russia 98, Brazil 99, Turkey 01, Argentina 02
- Enron, Worldcom
- Gulf War 1991

Stress Testing – Hypothetical

- Unexpected rate hike
- Surprising non-farm payrolls number
- Oil price shock
- Change in currency policy (eg. HKD, CNY)
- Missed earnings estimates

- *Subjective, but informative*

Stress Testing – Key vulnerabilities

- Spread moves (eg. within same capital structure)
- Credit events
- Liquidity (look at 1-week, 2-week moves)
- Operational (eg. Stock borrow, change in legality of an activity)

- *Subjective, often difficult to sell*

Stress Testing – Portfolio Protection

- Put Options
- Swaptions
- Credit Default swaps
- Portfolio Default swaps
- Indices

- *No free lunch*

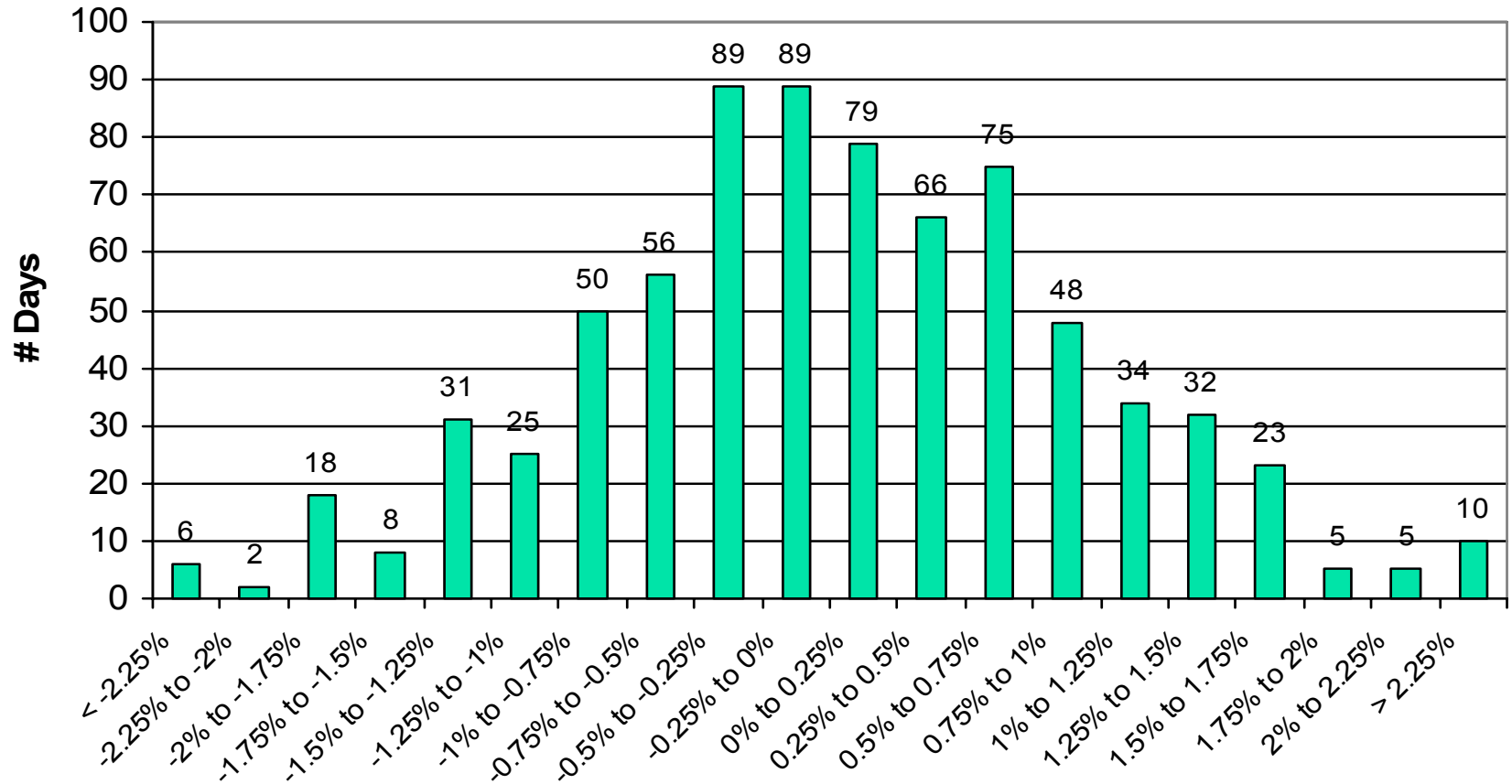
Value-At-Risk (VAR)
Historical Simulation Methodology

- Why historical simulation?
  - Does not make assumptions about distributions
  - Does not require correlation matrix
  - Does not use black-box packages, thus results are easy to defend and troubleshoot
  - Usually very easy to do in a spreadsheet with minimal programming
  - *EVERYONE UNDERSTANDS IT!*

VAR – Historical Simulation Methodology (cont.)

- Quick primer
  - Choose historical time period and confidence level (eg. 3 years at 99% confidence)
  - Reprice today's portfolio over each day in the time period using actual market moves
  - Sort hypothetical profit/losses from worst to best
  - Select result corresponding to confidence level chosen

Historical Simulation (Last 3 years)



VAR – Historical Simulation Methodology (cont.)

- Caveats
  - May need to map positions to indices if historical data is unavailable or unreliable
  - Non-linear instruments such as options require pricing models or decomposition approaches (eg. Taylor's expansion)
  - The price/yield levels today may be radically different than they were (eg. be careful about percent change and absolute market move assumptions, rates falling below 0, etc)
  - Assumes history is a reliable predictor of future volatility

Conclusion

- Evolving regulatory environment
- Employment outlook