Measuring and Managing Financial Risks

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Agenda

- Rise and rise of risk management
- Why manage risk?
- How can firms manage risk?
- By the numbers
- Managing more risks
- Rising or receding risk of recession?
What’s Old and New?

Old
- Well-managed business always managed risk

New
- Better tools and techniques
- Broader use of insights for business strategies
- Application to compensation and incentives
- Demands from public sector and public markets
The Rise of Risk Management

- Supply
- Demand
Better Tools

**Technical advances**

- Analytics
  - Value at Risk (VaR), stress tests, etc
- More, faster, cheaper data, storage, and analysis

**Market advances**

- More, cheaper ways to buy/sell assets & businesses
- More, cheaper derivatives available
  - Standardized
  - Customized
Riskier Business

- Domestic competition and entry increased
  - Technology accelerated
  - Globalization grew
    - Competitors, suppliers, FX, political
  - Public sector policies gyrated
    - Taxes, spending, regulations, interest rates
Rewards to Reducing Risk

- Some costs rise with risk
  - Value to creditors reduced if a firm goes BK
  - Lower taxes by smoothing earnings
  - Risk reduces debt capacity
  - Suppliers more demanding of risky firms
- Revenues reduced by risk
  - Customers desert troubled producers
- Reduce managers’ caution
- Protects funding of valuable projects
Candidates for Risk Reduction

- Firms with valuable franchises
  - Organizational, brand, monopoly or market power

- Leveraged firms
  - Financial leverage
    - High debt-equity ratio
  - Operating leverage
    - High fixed-variable cost ratio

- Firms with more growth opportunities
  - Protect internal funding of projects with NPV>0
How Can Firms Reduce Risk?

- Alter commercial operations
  - Reduce operating leverage
    - Reduce ratio of fixed to variable costs
      - Employee stock options, commissions
  - Merge
    - With financially stronger firm
    - With firm whose cash flow isn’t correlated
  - Make and/or sell socks, not pharmaceuticals
    - Shorten and shrink relationships with suppliers and customers
    - Homogenize and standardize
Why Melt Down Your Core?

- Solution might shed most profitable parts
  - Often, marketing expenses designed to differentiate, not standardize
- Often, that means get out of your business
  - But, usually the goal is to keep your business
- Goal of risk management to increase its value
  - By managing it better
How Can Firms Reduce Risk?

- Alter financial operations
  - Buy ordinary insurance
    - Fire, key employee, liability, lines of credit
  - Reduce financial leverage
    - Reduce debt/equity ratio
      - Pay out stock dividends when doing well

- Contracts
  - Commercial contracts
    - Input costs
    - Output revenues
  - Derivatives
    - Forwards, futures, credit default, etc
Focus on Future -- and Past

- Future is not the past
  - Risks are always present--in the future
  - Actual results differ from (future) risks
    - Past losses and gains aren’t measures of future risk
  - Probability distributions of future outcomes
    - Inherently uncertain
- But, the past informs us about the future
  - That is where data comes from
Data Mis-measures Risks

Theorem #1
- There is never enough of the right data

Theorem #2
- Half a loaf is better than none
Data Mis-measures Risks

Theorem #3

- Even two slices with peanut butter make a good sandwich
- Use the data and what you know
  - In practice, we need knowledge to supplement the insufficient data
Data Mis-measures Risks

- Theorem #4
  - The larger the risk, the worse the data, and the tougher to hedge
  - For example
    - PowerPoint risk
    - Interest rate risk
    - Cost risk
    - Sales risk
    - Public policy risk
    - Strategic and competitor risk
Why “Go by the Numbers”?

- Human biases in risk assessment
  - Widespread
  - Big enough to matter
- Over-estimation of high probabilities
- Under-estimation of low probabilities
- Over-weighting of recent events
- Over-weighting of similar events
- Framing of arguments affects decisions
Value at Risk (VaR)

- Maximum loss with high probability over specified interval
  - 99.7% chance that losses over the next 10 days will be less than $21 million
  - 99% chance that reported earnings this year will be at least $136 million
Uses of Value at Risk (VaR)

- Started passive
  - Provided reportable, aggregated, summary statistic
    - Allowed for probabilities
    - Allowed for correlations

- Became defensive
  - Criteria for setting limits

- Increasingly, used an active management tool
  - Shows effects of given trade or activity on risk
  - Shows features of trade or activity for risk target
  - Compensation for risk-adjusted return on capital
Stress Tests

- Informative about events not in data
  - Allows for plausible, perhaps low probability, outcomes
  - “Fat tails”
    - Higher probabilities than (normality-based) VaR-model of extreme events
- Uses
  - To supplement VaR information
    - Reduces “‘Gee, we never saw that before!’”
    - Or “‘But, that couldn’t have happened!’”
  - “What if” scenarios
    - Convey risks via outcomes and odds
Managing More Risks

- Imitation is sincerest sign of success
- Spreading enterprise-wide
  - To cover risks across business units
  - To cover different categories of risks
    - Interest rate risk, sales risk, FX risk, inventory cost risk
Enterprise-wide Risk Management

- ‘Natural’ hedges reduce need for costly, purchased hedges
  - Pairs of projects/divisions may impose less risk
    - Even when each alone is “too risky”
- Requires re-centralization of some decisions
  - Take account of correlation of business units
Cash Flow at Risk

- Spreading from balance sheet to income statement
- Asset/Liability Mgmt. often hedged cash flows
  - For example, GAP analysis
- VaR “advanced” to hedging shareholder equity
- Managing “Cash Flow at Risk”
  - Various items can be modeled and managed
    - Earnings at Risk, etc
  - Benefits of lower variances within income statement
    - Allows firms to satisfy loan or bond covenants
Risks for the U.S. Economy

- Stock markets are like champagne
  - Bubbles and hang-overs
    - Technology spending boom and bust
  - Is Japan the future for the U.S.?
- Oil and gas
  - Politics dominates economics
- You and me
- Federal Reserve interest rate policy
  - Boldly timid then and now?
Future always was and always will be risky
Risk management spreading
  - Across business units
  - Across financial statements
  - Risk of managing risks: “Model risk”
Business imperative to manage risk
  - Central(-ized) part of business strategy
  - Benefits from executive and board input
  - Focuses attention of executives and board
    - What do you do (best)?
    - For what reward?
    - With what risks?