Risk Management is a Process

Corporate Risk Management

Define  Measure  Manage  Monitor
Financial Risk Management

- Why does it matter?
- Why and when should we hedge?
- What should we hedge? How should we gauge exposure?

- Financial risk management must be tied to the company’s business

The Case For Hedging

- Company has special information
- Company has special market access
- Secure cash for investment opportunities
- Reduce potential costs of financial distress, increase debt capacity, and reduce expected taxes

Since currency matching reduces the probability of financial distress, it allows the firm to have greater leverage and therefore a greater tax shield.
Optimal Capital Structure

HEDGING CAN REDUCE COSTS OF FINANCIAL DISTRESS

VALUE OF THE FIRM

ALL-EQUITY VALUE

DEBT RATIO

Hedging, Valuation, Taxes and Financial Distress

Profile of return to creditors

Costs of bankruptcy to creditors

Distribution of net worth with hedging

Distribution of net worth without hedging (or with greater exchange rate volatility)

Net worth of the firm
**When Should Firms Hedge?**

<table>
<thead>
<tr>
<th>Business risk</th>
<th>Financial risk</th>
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</thead>
</table>

**Which Firms Should Hedge?**

Characteristics of firms for which financial stress is especially costly:

- Firms with:
  - Products that require after-sale servicing
  - Products whose quality is difficult to determine in advance
  - Products with high switching costs
  - Products that rely on third-party servicing

- And firms that have:
  - High-growth opportunities
  - Intangible assets like firm-specific human capital
  - Large excess tax deductions
What Exposure Should Firms Hedge?

- Currency risk
  - Transactions
  - Translation exposure
  - Economic exposure
- Interest Rate Risk
- Commodity Price Risk

Measuring Market Exposure

- Defining corporate exposure: “How will my company’s value be affected by market price fluctuations?”
- Types of exposure
  - Transactions
  - Balance sheet/portfolio
  - Economic
- A risk management framework
How Effective is My Company’s Risk Management?

Warning Signs:

- Don’t measure risk
- No linkage of risk to value
- No effort to anticipate
- Lack of business risk policy
- Fragmented effort
- Narrow focus
- Poor risk communications
- Lack of an integrated risk assessment framework

Formalize Risk Management Policy and Control Framework

- Develop an outline of a policy statement, or recommend improvements to existing document
- Benchmark controls versus best practice using the Group of Thirty Recommendations, Treasury Management Association Guidelines, or accumulated knowledge of appropriate practices
- Assess centralization issues related to financial risk management and treasury design
Identification and Definition of Financial Exposures

Goal: To identify significant financial risk exposures and prioritize them in a manner consistent with management's desired risk profile.

Translation Exposure, Transaction Exposure, and Economic Exposure

- Long-term versus short-term exposure
- Intracompany versus third party exposure
- Cross currency exposure
- Competitive exposures

Absolute Rate Risk, Convexity, Basis or Correlation Risk

- Short-term liquidity portfolio
- Investment portfolio
- Capital markets borrowing
- Leasing portfolio

Price Risk, Basis or Correlation Risk

- Procurement
- Inventory
- Sales elasticity

Market Risks: Definitions

Three Views of Market Price Risk:

+ Transactions
+ Balance Sheet/Portfolio
+ Economic risk.
**Market Risks: Definitions**

**Three Views of Market Price Risk:**
- Transactions
- Balance Sheet/Portfolio
- Economic risk.

**Transactions Exposure**
- Transactions exposure results from particular transactions such as an export where a known cash flow in a given currency will take place at a certain date
  - *Example: If Nokia invoices a NTT of Japan in Japanese yen for a cellphone shipment then the firm has Japanese yen exposure and can hedge this by borrowing yen.*
  - *This kind of exposure is readily hedgable using forwards, futures or debt*
But Transactions Exposure Can be Misleading...

+ Austin Computer purchases notebook computers in Taiwan for sale in the US.
+ Austin must pay in NT$.
+ Should it hedge its anticipated payments for 1996?
Interest Rate Risk: Portfolio

- **Portfolio risk**: interest rate fluctuations can affect the value of a bond investment portfolio
- Bond price fluctuations will affect the balance sheet
- Can be hedged, using *duration* as a risk/sensitivity measurement tool
- Can be hedged with futures, bond options, and swaps.

PepsiCo Pension

Assets (each $10m):
- 1-year E$ deposit
- 5-year, 6% T-note D=4.6
- 10-year Strip

Pension liabilities:
- $10m 3 years
- $10m 5 years
- $10m 7 years

- What is PepsiCo pension fund’s risk?
  - Duration of the assets (+ve)
  - Duration of the liabilities (-ve)
  - *Net duration is the risk to be hedged!*
**Value at Risk: SantosBank**

Asset and liability positions for a Brazilian bank’s New York branch. What risk does it face?

<table>
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<th>INSTRUMENT</th>
<th>SANTOSBANK POSITIONS</th>
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<tr>
<td>30 day</td>
<td>($1,250,000)</td>
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<td>90 day</td>
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**BIS: Minimize Value at Risk**

Transactions Exposure + Portfolio Exposure = Economic Exposure

Value-at-Risk
**Market Price Risk: Economic**

- **Economic risk** arises from the real business risk of the company, insofar as it is tied to market interest rates, FX, commodity prices.
- It affects the *shareholder value*, but may be difficult to quantify.
- Hedging may require tailored solutions.

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**Inmet Mining Corp.**

- In 1994 Canadian mining company Inmet bought 48% of Bougrine, a lead & zinc mine in Tunisia. Inmet had to borrow $33 million at a floating rate. Should it hedge its cost of funds?
- Answer: Business exposure is to lead & zinc prices (mine shutdown in Oct 96 because of low zinc prices).
- Hedge with digital option linking cost of funds to lead & zinc prices.
Market Price Risks: Summary

Three Views of Market Price Risk:

- **Transactions** - lock in forward rate
- **Portfolios**
  - Avoid duration mismatching
- **Minimize Value at Risk**
- **Economic risk** - business sensitivity to market prices.

Most Important Objective In Using Derivatives To Hedge

- Volatility in Cashflow: 49%
- Volatility in Earnings: 42%
- Balance Sheet Accounts: 1%
- Market Value of the Firm: 8%

CIBC Wood Gundy/Wharton 1995 End-User Survey “Most Important” Objective In Using Derivatives To Hedge
Next Step: Analyze Current Exposure Measurement Techniques

Risk Information Sources:
- Current trade flow data
- Portfolio system reports
- Accounting information
- Budgeted trade flow data
- Pricing practices

- Precision of the data
- Time horizon of the projections
- Frequency of reporting

Quantification Adequacy

Corporate Exposure Information Sources

Hard

- Current trade flow data
- Portfolio system reports
- Accounting information
- Budgeted trade flow data
- Economic exposure estimates

Soft
Exposure Database: Example

From Data to Analysis

Exposure Measurement System
A Management-Friendly Report

An example is FourFifteen™, named after J.P. Morgan's market risk report produced at 4:15 p.m. each day.


Portfolio Risk Simulation


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<th>BEF</th>
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Exposure Report: Example
Market Risk Measurement

Where are we now? Where do we need to be?

- Volumetric: Notional Amounts
  - Linear risk measures
  - Swap/ bond equivalents

- Duration/ PV01: Non-linear risk measures
  - Delta, gamma, vega, theta, rho
  - No aggregation of risk measures across asset classes or instruments

- Option Sensitivity Measures: Limited market scenarios that could include market correlations
  - Reprice portfolio
  - Parallel and non-parallel curve shifts
  - Aggregate portfolio risk per scenario

- Simulations: Distribution of market moves and portfolio values
  - Includes market correlations
  - Reprice portfolio
  - Aggregate risk measures within confidence interval

Value at Risk

Market Risk Measurement

An Overview of Corporate VAR

Estimates of Cash Flow Distribution

Impact on Earnings
Analyze Exposure Management Activities

- Investigate opportunities for natural offsets
- Evaluate alternative hedging techniques
- Cost/benefit analysis
- Strategic alignment

• Multicurrency borrowing/investing, currency of invoice, & commercially-based hedging techniques
• Financial instruments such as forwards, futures, swaps and options
• Expected and out-of-pocket costs, benefits and risks of potential strategies; competitors’ actions
• Accordance with overall corporate policy and acceptable from an accounting and regulatory standpoint, if applicable

Corporate Exposure Management: Match Tools to Risks

Hard

- Current trade flow data
- Portfolio system reports
- Accounting information
- Budgeted trade flow data

Inflexible, committed

Soft

- Economic exposure estimates

Flexible, optional
**Most-Used Instruments**

*Hedge Identifiable Exposure*

<table>
<thead>
<tr>
<th>Type of Transaction</th>
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<th>10%</th>
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<td>Hybrid Debt</td>
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**Market Views Impact**

*Corporate FX Hedging Decisions*

- Alter the Timing of Hedges: 11% Sometimes, 61% Frequently
- Alter the Size of Hedges: 12% Sometimes, 48% Frequently
- Actively Take Positions: 6% Sometimes, 33% Frequently
Sources of Corporate Financial Risk

Uncertain Markets

Uncertain Exposures

Risk!

Mistaken Views

Wrong Risk Measurement Methods

Monitoring and Control

• Monitoring implies performance measurement
• Performance measurement is the science of attribution
• Performance measurement requires a benchmark
• Surprises require reassessment and response
Evaluate Management Reporting and Risk Management Monitoring Process

Management reporting and focused performance measurement are necessary to identify problems with the current risk management strategies.

Summary: Corporate Market Risk Management is a Process

Corporate Risk Management

- Define
- Measure
- Manage
- Monitor
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