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# Class #12: “Risk Assessment”

## Do Financial Statements Capture Risk?

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# Where Have We Been & Where Are We Going?

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- Team Projects
  - Part 1 of Projects posted on the web
  - Comments on projects and due diligence – hand back after break
  - Part 2 – Valuation: Due May 9, 2003
- Quiz #1
  - Solutions on class server
  - Comment on Re-grades
  - Quiz statistics

# Where Have We Been & Where Are We Going?

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- ***Class 1 through Quiz #1***
  - Valuation Basics, Accounting-based Valuation, Multiples Analysis
  - Cash Flow Analysis, Refresher on Financial Statements
  - Detecting Accounting Manipulations
  - Part 1 of Project (Cash Flow Projections/Earnings Quality Analysis)
- ***Class 12 through Quiz #2***
  - Risk Assessment (Credit), Cost of Capital Calculations
  - Risk and Analyzing Accounting Trading Strategies
  - Mergers and Acquisitions, Stock Options
- ***Class 20 through Final Project Presentations***
  - Off Balance Sheet Activities, Pension Plans, International Accounting and Valuation

# Financial Statement Analysis – Risk Assessment

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- Common-Size Financial Statements (cross-sectional analysis)
  - e.g. Deflate all financial numbers by total assets
- Trend Financial Statements (time-series analysis)
  - Compare growth rates over time
- Financial Ratio Analysis
  - Profitability ratios, short-term liquidity ratios, long-term solvency ratios

# Accounts Receivable Turnover

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Measures how soon sales will be become cash:

$$\text{Accounts Receivable Turnover} = \frac{\text{Net Sales on Account}}{\text{Avg Accounts Receivable}}$$

Perhaps a more intuitive measure of the rate at which A/R are being collected is the days receivable outstanding:

$$\text{Days Receivable Outstanding} = 365 / \text{Accounts Receivable Turnover}$$

# Inventory Turnover Ratio

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This ratio measures how quickly inventory is being sold.

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

Perhaps a more intuitive measure of the rate at which inventory is being sold is the days inventory held:

$$\text{Days Inventory Held} = 365 / \text{Inventory turnover}$$

# Fixed Asset Turnover

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Measures the relation between sales and the investment in property, plant, and equipment.

How efficiently is the firm using its fixed assets to generate sales?

$$\text{Fixed asset turnover} = \frac{\text{Sales}}{\text{Average fixed assets}}$$

# Accounts Payable Turnover

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Measures how quickly a firm is paying its suppliers.

$$\frac{\text{Accounts Payable}}{\text{Turnover}} = \frac{\text{Purchases}}{\text{Average Accounts Payable}}$$

Also can be expressed as:

$$\text{Days Payable Outstanding} = 365 / (\text{Accounts Payable Turnover Rate})$$

# Analysis of Short-Term Liquidity

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- Sheds light on a firm's ability to pay for obligations that come due during its operating cycle (e.g., wages, purchases of inventory).
- Commonly used measures of short-term debt paying ability include:
  - Current Ratio
  - Quick Ratio
  - Operating Cash Flow to Current Liabilities Ratio

# Current Ratio

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$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

- This ratio matches the amount of cash and other current assets that will become cash within one year against the obligations that come due in the next year.
- Basic rule of thumb: A minimum current ratio of 1.0.

# Quick Ratio

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A variation of the current ratio is the quick ratio or acid test ratio.

$$\text{Quick Ratio} = \frac{\text{Cash} + \text{Mkt Securities} + \text{AR}}{\text{Current Liabilities}} = \frac{\text{CA-Inv}}{\text{CL}}$$

Include in the numerator only those current assets that the firm could convert quickly into cash

# Operating Cash Flow to Current Liabilities Ratio

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- Another measure a firm's short-term liquidity.
  - The advantage is that it is based on cash flow **AFTER** the funding needs for working capital (i.e., accounts receivables and inventory) been made.

Operating Cash Flow

Average Current Liabilities

# Long-Term Solvency Ratios

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- Measure a firm's ability to meet interest and principal payments on long-term debt (and similar obligations, like long-term leases) when they come due.
- Obviously, the best indicator for assessing long-term solvency risk is a firm's ability to generate earnings over a period of years.

# Long-Term Solvency Ratios

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$$\text{Long-Term Debt Ratio} = \frac{\text{Long-Term Debt}}{\text{Long-Term Debt} + \text{Shareholders' Equity}}$$

$$\text{Debt/Equity Ratio} = \frac{\text{Long-Term Debt}}{\text{Shareholders' Equity}}$$

$$\text{Liabilities/Assets Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

# Interest Coverage Ratio

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Measures how many times a firm's net income before interest expense and income taxes exceeds its interest expense.

$$\frac{\text{Net Income} + \text{Interest Expense} + \text{Income Tax Expense} + \text{Minority Interest in Earnings}}{\text{Interest Expense}}$$

**Interest coverage ratios less than 2.0 suggest a risky situation.**

# Cash Interest Coverage Ratio

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- Interest coverage ratio using cash flows is:

$$\frac{[\text{Cash Flow from Operations} + \text{Cash Payments for Interest} + \text{Cash Payments for Income Taxes}]}{\text{Cash Payments for Interest}}$$

# Accounting, Risk and Hedging:

## What is hedging?

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- What is hedging?
  - In response to financial market risks, companies engage in hedging: business and financial transactions designed to insulate them from commodity price, interest rate, exchange rate, or other risks. Derivative securities are often used to accomplish this insulation.
- Different from speculation: How?
- Examples:
  - Options, futures contracts, swaps, other complex combinations of derivatives.

# Why do firms hedge?

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- The value of equity claims in the firm are:
  - Price =  $E(CF_1)/(1+r) + E(CF_2)/(1+r)^2 + \dots$
- How can we increase firm value?
  - The equity cost of capital ( $=r$ ) depends on the systematic risk of the firm's cash flows.
  - Insurable or hedgeable risks are generally nonsystematic
  - Since insurance purchases apparently do not affect a firm's systematic risk, then they should not change the firm's cost of capital.
  - If insurance purchases affect firm value, then they must change future expected cash flows!

# Hedging and the Modigliani-Miller Theorem

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- If hedging affects current firm value, then it must:

1)

2)

3)

# How Hedging Impacts Firm Value

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- Taxes:
  - A progressive tax scheme (or, at a minimum, incomplete “tax refunds” of losses) means that the more volatile a firm’s taxable income, the higher its expected taxes. (See notes from last day)
- Contracting Costs:
  - Stockholders, employees, bondholders, suppliers and customers all have high incentives to avoid financial distress. Why?
    - Customers: Product warranties & long-term service arrangements
    - Suppliers: Undiversified – locked in to single client

# Hedging and the Firm's Employees

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- Employees (from the CEO down to temp workers) face real costs to financial distress
- If the firm is risky, employees require higher compensation (risk aversion)
- Executive incentive compensation should only impose “risk” on managers if they have control over the outcomes.
  - Maybe managers are hedging too much?

# Hedging and Bondholder-Shareholder Conflict

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- The agency costs of debt increase as leverage increases and financial distress approaches
  - Remember: stockholders and managers are self-interested
  - Therefore, we get:the:
    - Dividend payout problem
    - Claim dilution problem
    - Asset substitution problem
    - Underinvestment problem
- Hedging can reduce the likelihood of financial distress, and consequently reduce the agency problems of debt ... This means firms can have easier access to the debt markets.
- What does this mean for future expected cash flows?

# Summary of Risk Assessment using Financial Information

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- Analysis of a particular firm's financial ratios over a period of years allows one to track historical trends and variability in the ratios over time.
- Key is compare with industry benchmarks.
- An important part of the analyst's job is to use financial ratios to identify aspects of the firm that warrant deeper investigation.

# Where Next?

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- Readings Related to Today's Class:
  - “Risk Analysis” – pages 145-159 of Section (F) of Course Reader (*“Introduction to Profitability and Risk Analysis”*)
- Reading for Next Class after the break (Tuesday, April 1) – Cost of Capital Calculations
  - Skim over cost of capital issues in Section (C) of Course Reader (*“Firm Valuation: Cost of Capital”*)