

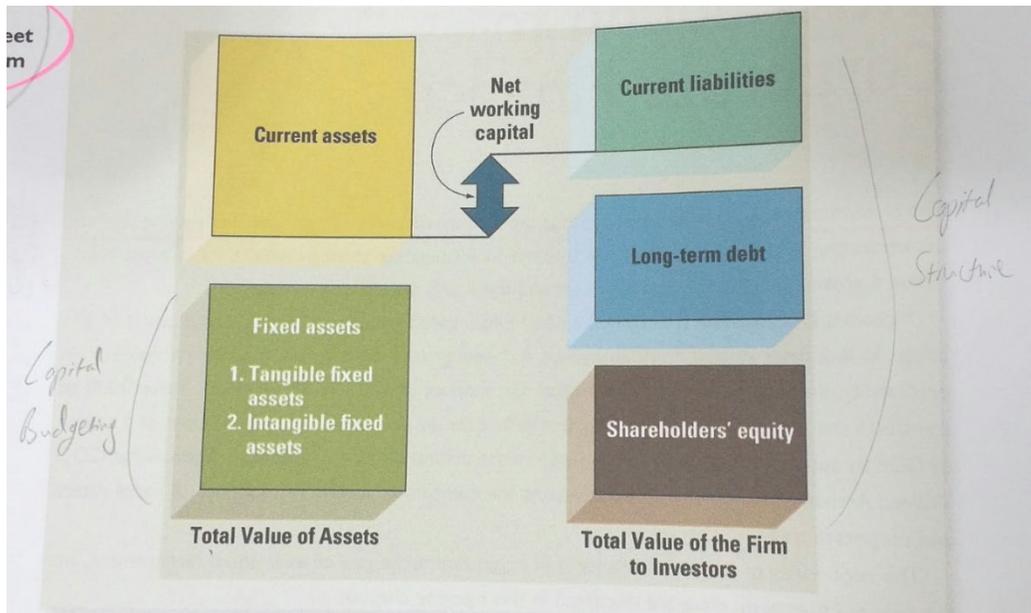
## Chapter 1: Introduction to Corporate Finance

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Finance: the art and science of managing funds

Corporate finance has three main areas of concern:

1. Capital budgeting
2. Capital structure
3. Working capital management



Financial manager's goal:

1. Selecting value creating projects
2. Making smart financing decisions

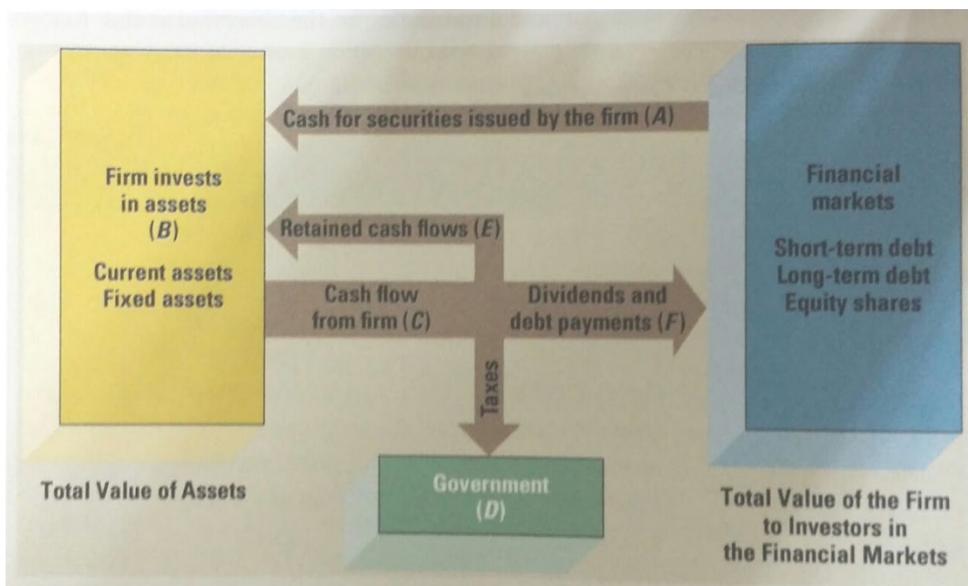
Under him, there is:

1. Treasurer:
  - a. handle cash flows
  - b. managing capital expenditure
  - c. making financial plans
2. Controller (handles the accounting function):
  - a. taxes
  - b. cost and financial accounting
  - c. information systems

A comparison between partnership and corporations:

	Corporation	Partnership
<b>Liquidity</b>	Shares can be easily exchanged	Subject to substantial restrictions
<b>Voting Rights</b>	Usually each share gets one vote	General Partner is in charge; limited partners may have some voting rights
<b>Taxation</b>	Double	Partners pay taxes on distributions
<b>Reinvestment and dividend payout</b>	Broad latitude	All net cash flow is distributed to partners
<b>Liability</b>	Limited liability	General partners may have unlimited liability; limited partners enjoy limited liability
<b>Continuity</b>	Perpetual life	Limited life

Cash flows between the firm and the financial market



- The cash flows from the firm must exceed the cash flows from the financial markets.
- Ultimately, the firm must be a cash generating activity.

Possible financial goals:

1. Concerned with profitability
  - a. maximize sales or market share
  - b. minimize costs
  - c. maximize profits
2. Concerned with controlling risk
  - a. survive
  - b. avoid financial distress and bankruptcy
  - c. maintain steady earnings growth
3. Both
  - a. beat the competition

→ the goal of financial management is to maximize the current value per share of the existing stock

Agency relationship: Principal hires an agent to represent his/her interest

Agency problem: Conflict of interest between principal and agent

- Important Laws:
  - 1933 → Glass-Steagall act, FDIC and separated the activities of commercial and investment banks
  - 1933 → Securities act, primary market regulations
  - 1934 → securities act, secondary market regulations
  - 1999 → Gramm-Leach-Bliley, repealed Glass-Stegall act
  - 2002 → Sarbanes-Oxley act, PCAOB

## Chapter 2: Financial Statements and Cash Flow

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Balance sheet: an accountant's snapshot of a firm's accounting value on a particular date, as though the firm stood momentarily still.

→ when analyzing a balance sheet, the financial manager should be aware of three concerns:

- liquidity
- debt vs. equity
- value vs. cost

Income statement: measures performance over a specified period.

Free cash flow: cash that the firm is free to distribute to creditors and stockholders because it is not needed for working capital or fixed asset investments.

The use of cash flow as a metric for evaluating a company comes from the idea that there is less subjectivity involved (even though it can be manipulated).

### Chapter 3: Financial Statements Analysis and Financial Models

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To compare firms with differences in size, use a common-size statement

<b>Assets</b>	<b>2011</b>	<b>2012</b>	<b>Change</b>
Current assets			
Cash	2.5%	2.7%	+ .2%
Accounts receivable	4.9	5.2	+ .3
Inventory	11.7	11.8	+ .1
Total	<u>19.1</u>	<u>19.7</u>	<u>+ .6</u>
Fixed assets			
Net plant and equipment	80.9	80.3	- .6
Total assets	<u>100.0%</u>	<u>100.0%</u>	<u>.0%</u>
<b>Liabilities and Owners' Equity</b>			
Current liabilities			
Accounts payable	9.2%	9.6%	+ .4%
Notes payable	6.8	5.5	-1.3
Total	<u>16.0</u>	<u>15.1</u>	<u>-.9</u>
Long-term debt	<u>15.7</u>	<u>12.7</u>	<u>-3.0</u>
Owners' equity			
Common stock and paid-in surplus	14.8	15.3	+ .5
Retained earnings	53.3	56.9	+3.6
Total	<u>68.1</u>	<u>72.2</u>	<u>+4.1</u>
Total liabilities and owners' equity	<u>100.0%</u>	<u>100.0%</u>	<u>.0%</u>

Commonly used measures of earnings:

1. Net income
2. EPS
3. EBIT
4. EBITDA

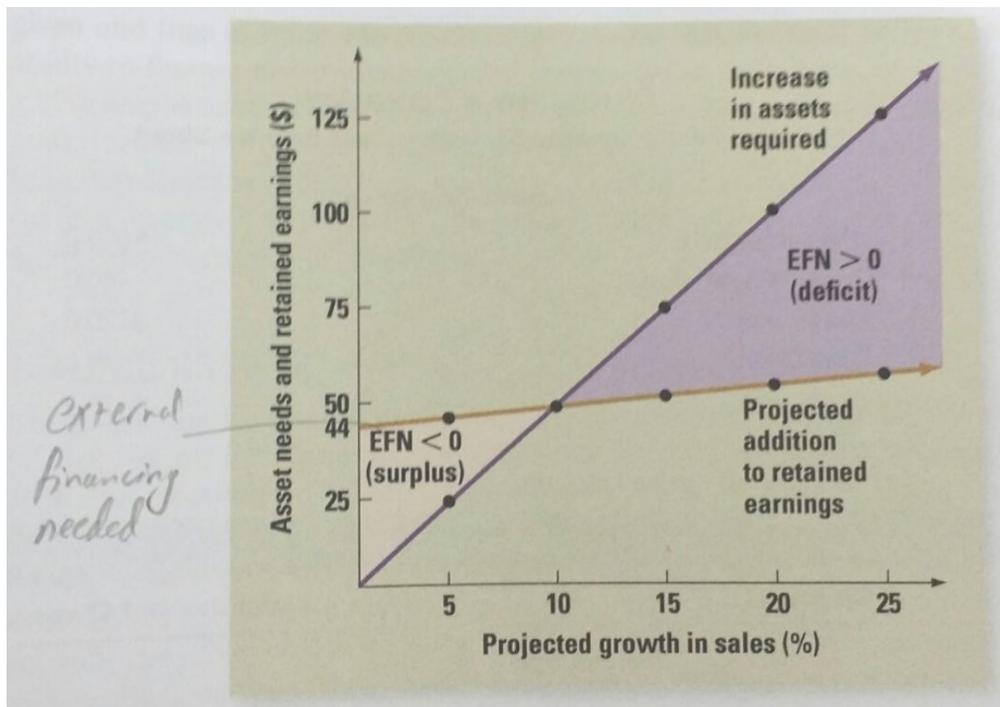
Common financial ratios:

<b>I. Short-Term Solvency, or Liquidity, Ratios</b>	
Current ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$	Days' sales in receivables = $\frac{365 \text{ days}}{\text{Receivables turnover}}$
Quick ratio = $\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$	Total asset turnover = $\frac{\text{Sales}}{\text{Total assets}}$
Cash ratio = $\frac{\text{Cash}}{\text{Current liabilities}}$	Capital intensity = $\frac{\text{Total assets}}{\text{Sales}}$
<b>II. Long-Term Solvency, or Financial Leverage, Ratios</b>	
Total debt ratio = $\frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}}$	<b>IV. Profitability Ratios</b>
Debt-equity ratio = $\frac{\text{Total debt}}{\text{Total equity}}$	Profit margin = $\frac{\text{Net income}}{\text{Sales}}$
Equity multiplier = $\frac{\text{Total assets}}{\text{Total equity}}$	Return on assets (ROA) = $\frac{\text{Net income}}{\text{Total assets}}$
Times interest earned ratio = $\frac{\text{EBIT}}{\text{Interest}}$	Return on equity (ROE) = $\frac{\text{Net income}}{\text{Total equity}}$
Cash coverage ratio = $\frac{\text{EBITDA}}{\text{Interest}}$	ROE = $\frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$
<b>III. Asset Utilization, or Turnover, Ratios</b>	
Inventory turnover = $\frac{\text{Cost of goods sold}}{\text{Inventory}}$	<b>V. Market Value Ratios</b>
Days' sales in inventory = $\frac{365 \text{ days}}{\text{Inventory turnover}}$	Price-earnings ratio = $\frac{\text{Price per share}}{\text{Earnings per share}}$
Receivables turnover = $\frac{\text{Sales}}{\text{Accounts receivable}}$	Market-to-book ratio = $\frac{\text{Market value per share}}{\text{Book value per share}}$
	EV multiple = $\frac{\text{Enterprise value}}{\text{EBITDA}}$

The DuPont identity tells us that ROE is affected by three things:

1. Operating efficiency, measured by profit margin
2. Asset use efficiency, measured by total asset turnover
3. Financial leverage, measured by the equity multiplier
4. Dupont system of analysis: system used to dissect the firm's financial statements and to assess its financial condition.
  - a.  $ROE = ROA * FLM$
  - b.  $ROE = (\text{net profit margin} * \text{total asset turnover}) * FLM$ 
    - i. The *net profit margin* measures profits on sales
      1.  $\frac{\text{earnings available for common stockholders}}{\text{sales}}$
    - ii. The *total asset turnover* measures the efficiency of asset use
      1.  $\frac{\text{sales}}{\text{total assets}}$
    - iii. The *FLM* measures the financial leverage of the firm
      1.  $\frac{\text{total assets}}{\text{common stock equity}}$

Growth and related financing needed for a company:



### I. Internal Growth Rate

$$\text{Internal growth rate} = \frac{\text{ROA} \times b}{1 - \text{ROA} \times b}$$

where

ROA = Return on assets = Net income/Total assets

$b$  = Plowback (retention) ratio  
= Addition to retained earnings/Net income

The internal growth rate is the maximum growth rate that can be achieved with no external financing of any kind.

### II. Sustainable Growth Rate

$$\text{Sustainable growth rate} = \frac{\text{ROE} \times b}{1 - \text{ROE} \times b}$$

where

ROE = Return on equity = Net income/Total equity

$b$  = Plowback (retention) ratio  
= Addition to retained earnings/Net income

The sustainable growth rate is the maximum growth rate that can be achieved with no external equity financing while maintaining a constant debt-equity ratio.

Determinants of growth:

1. Profit margin
2. Dividend policy
3. Financial policy (debt-equity ratio)
4. Total asset turnover

→ if a firm does not wish to sell new equity and the determinants of growth are all fixed, then there is only one possible growth rate

## Chapter 4: Discounted Cash Flow Valuation

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Review chapters 5,6,7 from the previous book (Principles of Managerial Finance).

Simplifying formulas for the present value:

$$\text{Perpetuity: } PV = \frac{C}{r}$$

$$\text{Growing perpetuity: } PV = \frac{C}{r - g}$$

$$\text{Annuity: } PV = C \left[ \frac{1 - \frac{1}{(1+r)^T}}{r} \right]$$

$$\text{Growing annuity: } PV = C \left[ \frac{1 - \left( \frac{1+g}{1+r} \right)^T}{r - g} \right]$$

## Chapter 5: Net Present Value and Other Investment Rules

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NPV > zero → accept

NPV < zero → reject

Properties:

- Uses all cash flows
- Discounts the cash flows properly

Payback period issues:

- Timing
- Payments after cutoff
- Arbitrary standard

Discounted payback period:

- Length(discounted payback period) > length(normal payback period)

IRR: the rate that causes NPV = zero

→ accept if IRR > discount rate

Types of projects:

- Independent (1)
- Mutually exclusive (2)

Issues affecting (1) and (2):

- Investing vs. financing
  - In the case of financing, reverse the IRR rule
- Multiple rates of return
  - Use MIRR

Issues affecting (2):

- Scale → use NPV
- Timing → use NPV
- Capital rationing
- Don't use the profitability index method

$$\text{Profitability index} = \frac{\text{PV of cash flows}}{\text{investment}}$$

- If  $\text{PI} > 1 \rightarrow$  accept
- If  $\text{PI} < 1 \rightarrow$  reject

$$\text{Accounting Rate of Return (ARR)} = \frac{\text{average net income}}{\text{average book value of investment}}$$

## Chapter 6: Making Capital Investment Decisions

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Possible side effects of projects:

- Synergy
- Erosion

→ finding the NPV of a project is independent of financing decisions

Real rate of interest:

- Exact formula

$$(1 + \textit{nominal}) = (1 + \textit{real}) * (1 + \textit{inflation})$$

$$\textit{real} = \frac{1 + \textit{nominal}}{1 + \textit{inflation}} - 1$$

- Approximate formula

$$\textit{real} = \textit{nominal} - \textit{inflation}$$

→ DO NOT MIX REAL AND NOMINAL CASH FLOWS!

→ To discount using real rate:

- Discount using inflation rate
- Discount using real rate

To find the equivalent cash flows (using the calculator):

- Find PV
- Find PMT
- PMT == equivalent annual payment

## Chapter 7: Risk Analysis, Real Options, and Capital Budgeting

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Types of variability analysis:

- Sensitivity analysis – what if analysis – bop analysis
- Scenario analysis
- Break even analysis
- Monte Carlo simulation

Real options considered in valuations:

- The option to expand
- The option to abandon
- Timing options

## Chapter 8: Interest Rates and Bond Valuation

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Review chapters 5,6,7 from the previous book (Principles of Managerial Finance).

Bond prices and interest rates always move in opposite directions.

$$\text{Bond's current yield} == \text{coupon } r\% == \frac{\text{coupon } \$}{\text{price } \$}$$

Bonds are rated based on their default risk

Bond yields and interest rates reflect six different factors:

1. Real interest rate
2. Inflation premium
3. Risk premium
4. Default premium
5. Tax premium
6. Liquidity preference premium

## Chapter 9: Stock Valuations

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Review chapters 5,6,7 from the previous book (Principles of Managerial Finance).

Review the chapter slides.

Stock valuation methods:

1. Zero growth
2. Constant growth
3. Variable growth

Growth rate = Retention ratio × Return on retained earnings (or ROE)

The value of a firm can be conceptualized as the sum of the value of a firm that pays out 100% of its earnings as dividends plus the net present value of the growth opportunities.

$$P = \frac{EPS}{R} + NPVGO$$

Dividing every term by EPS provides the following description of the PE ratio:

$$PE = \frac{1}{R} + \frac{NPVGO}{EPS}$$

So, a firm's PE ratio is positively related to growth opportunities and negatively related to risk (R).

→ REVIEW THE STATISTICS FORMULAS ←

*total dollar return = dividend income + capital gain (loss)*

$$\text{total rate of return} = \frac{\text{Dividend}_1 + (P_1 - P_0)}{P_0}$$

Sharpe Ratio: The Sharpe ratio uses standard deviation to measure a fund's risk-adjusted returns. The higher a fund's Sharpe ratio, the better a fund's returns have been relative to the risk it has taken on.

$$\text{Sharpe Ratio} = \frac{R_{\text{portfolio}} - R_{\text{free}}}{\text{Standard Deviation}_{\text{portfolio}}}$$

Arithmetic mean

$$A = \frac{1}{n} \sum_{i=1}^n a_i = \frac{a_1 + a_2 + \dots + a_n}{n}$$

Geometric mean:

$$\left( \prod_{i=1}^n x_i \right)^{\frac{1}{n}} = \sqrt[n]{x_1 x_2 \dots x_n}$$

Difference?

- Geometric mean → useful in describing the actual historical investment experience (usually smaller than the arithmetic mean)
- Arithmetic mean → useful in making estimates of the future

## Chapter 11: Return and Risk, the capital asset pricing model (CAPM)

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→ REVIEW THE STATISTICS FORMULAS ←

Hedge: an investment to reduce the risk of adverse price movements in an asset (i.e., negative correlation / covariance).

As long as we don't have perfect correlation (i.e., correlation < 1)

→ the standard deviation of a portfolio < weighted average of the standard deviation of individual securities

Important concepts:

- Feasible set
- Minimum variance point
- Efficient set

→ the variance of the return on a portfolio with many securities is more dependent on the covariances between the individual securities than on the variances of the individual securities.

Types of risk:

- Systematic (i.e., beta)
- Unsystematic

→ unsystematic risk can disappear through diversification

→ Beta measures the responsiveness of a security to movements in market portfolio

$$\text{Beta} = \frac{\text{Covariance } (r_i, r_m)}{\text{Variance } (r_m)}$$

measuring risk:

- Single security → use variance / standard deviation
- Diversified portfolio → use beta

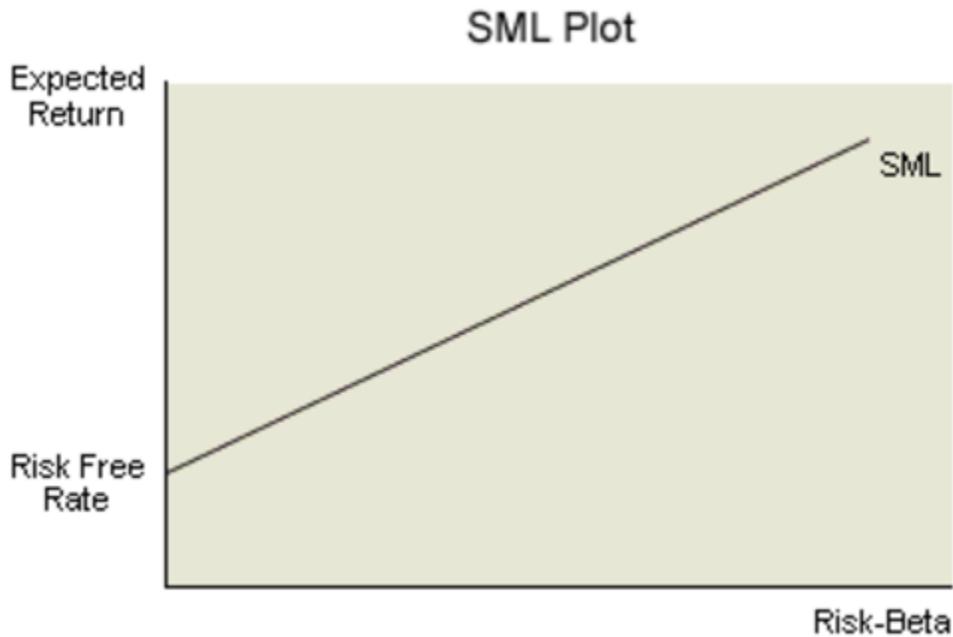
CAPM:

*expected return on a security*

$$= \text{risk free rate} + (\text{beta of the security} * (\text{expected market return} - \text{risk free rate}))$$

→ to calculate CAPM for a portfolio, use the weighted average of the beta's

The security market line (SML) is the line that reflects an investment's risk versus its return, or the return on a given investment in relation to risk. The measure of risk used for the security market line is beta.



## Chapter 12: An Alternative View of Risk and Return

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Different ways of predicting return:

- Using the capital asset pricing model (CAPM)
  - Contains one beta
- Using the arbitrage pricing theory (APT)
  - Contains multiple betas as needed
  - Arbitrage pricing theory is an asset pricing model based on the idea that an asset's returns can be predicted using the relationship between that asset and many common risk factors.
- Empirical models
- Style portfolios
  - Value ( $P/E < \text{market}$ ) vs growth ( $P/E > \text{market}$ ) portfolio
  - Comparison to market index
  - Comparison to other financial managers (e.g., fund performance)
  - M/B ratio

## Chapter 13: Risk, Cost of Capital, and Valuation

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→ the discount rate of a project should be the expected return on a financial asset of comparable risk

→ Discount rate synonyms:

- Required rate of return
- Cost of capital
- Cost of equity capital (if no leverage)

$$\text{cost of equity capital} = \text{risk free rate} + [\text{beta} * (\text{market return} - \text{risk free rate})]$$

→ expected shareholder return == firm cost of capital

Choosing a risk-free rate:

- One year T-Bill
- Average one year rate anticipated over the life of the project

Choosing a market return:

- Using historical data (i.e., 7 percent)
- Using the dividend discount model for the market

Choosing a Beta:

$$\text{Beta} = \frac{\text{Covariance } (r_i, r_m)}{\text{Variance } (r_m)}$$

- 
- Straight line regression (using 5-year historical data)
- Using industry Beta
- Via its components:
  - Cyclicity of revenues (note: cyclicity  $\neq$  variability)
  - Operating leverage
  - Financial leverage

DDM vs CAPM

- CAPM is preferred
- CAPM uses historical data
- CAPM explicitly considers risk

$$WACC = (R_{equity} * \frac{equity}{equity + debt}) + (R_{debt} * \frac{debt}{equity + debt} * (1 - tax\ rate))$$

*expected return on a security ( $R_{equity}$ )*

$$= risk\ free\ rate + (beta\ of\ the\ security * (expected\ market\ return - risk\ free\ rate))$$

→ it is best to use market (or even target) debt / equity weights

→ WACC == discount rate used in NPV

Flotation cost: contains the issue cost of debt / equity (can be used instead of WACC)

$$flotation\ cost = (flotation\ cost_{equity} * \frac{equity}{equity + debt}) + (flotation\ cost_{debt} * \frac{debt}{equity + debt} * (1 - tax\ rate))$$

## Chapter 14: Efficient Markets and Behavioral Challenges

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Foundations of market efficiency:

- Rationality
- Independent deviations from reality
- Arbitrage

The different types of efficiency:

- Weak form
  - information set of past prices
- Semi-strong form
  - information set of past prices
  - information set of publicly available information
- strong form
  - information set of past prices
  - information set of publicly available information
  - all information relevant to a stock

Misconceptions about the efficient markets hypothesis:

- the efficacy of dart throwing
- price fluctuations
- stockholder disinterest

Behavioral finance arguments against the efficient markets hypothesis:

- investors may be irrational
- irrationality may be related across investors (i.e., herd behavior)
- arbitrage strategies may involve too much risk to eliminate inefficiencies

Empirical challenges to market efficiency:

- limits to arbitrage
- earnings surprises
- size
- value versus growth
- crashes and bubbles

## Chapter 15: Long-Term Financing

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General stuff, no summary needed.

→ managers should choose the capital structure that they believe will have the highest firm value because this capital structure will be most beneficial to the firm's stockholders

Modigliani-Miller Propositions

**Summary of Modigliani-Miller Propositions without Taxes**

**Assumptions**

- No taxes.
- No transaction costs.
- Individuals and corporations borrow at same rate.

**Results**

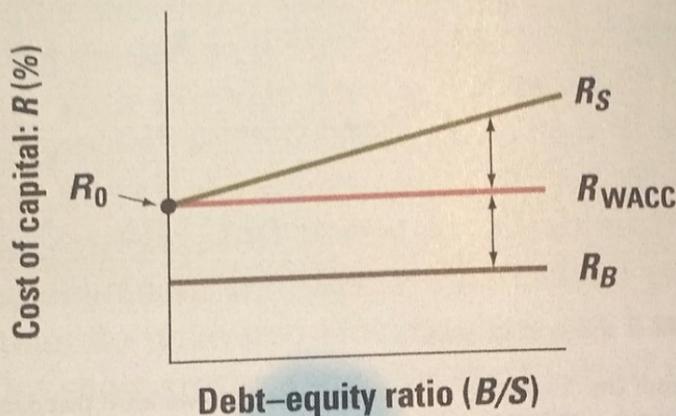
Proposition I:  $V_L = V_U$  (Value of levered firm equals value of unlevered firm)

Proposition II:  $R_S = R_0 + \frac{B}{S}(R_0 - R_B)$

**Intuition**

Proposition I: Through homemade leverage individuals can either duplicate or undo the effects of corporate leverage.

Proposition II: The cost of equity rises with leverage because the risk to equity rises with leverage.



$$R_S = R_0 + (R_0 - R_B)B/S$$

$R_S$  is the cost of equity.

$R_B$  is the cost of debt.

$R_0$  is the cost of capital for an all-equity firm.

$R_{WACC}$  is a firm's weighted average cost of capital. In a world with no taxes,  $R_{WACC}$  for a levered firm is equal to  $R_0$ .

$R_0$  is a single point whereas  $R_S$ ,  $R_B$ , and  $R_{WACC}$  are all entire lines.

The cost of equity capital,  $R_S$ , is positively related to the firm's debt-equity ratio. The firm's weighted average cost of capital,  $R_{WACC}$ , is invariant to the firm's debt-equity ratio.

## Summary of Modigliani-Miller Propositions with Corporate Taxes

### Assumptions

- Corporations are taxed at the rate  $t_c$  on earnings after interest.
- No transaction costs.
- Individuals and corporations borrow at the same rate.

### Results

Proposition I:  $V_L = V_U + t_c B$  (for a firm with perpetual debt)

Proposition II:  $R_S = R_0 + \frac{B}{S}(1 - t_c)(R_0 - R_B)$

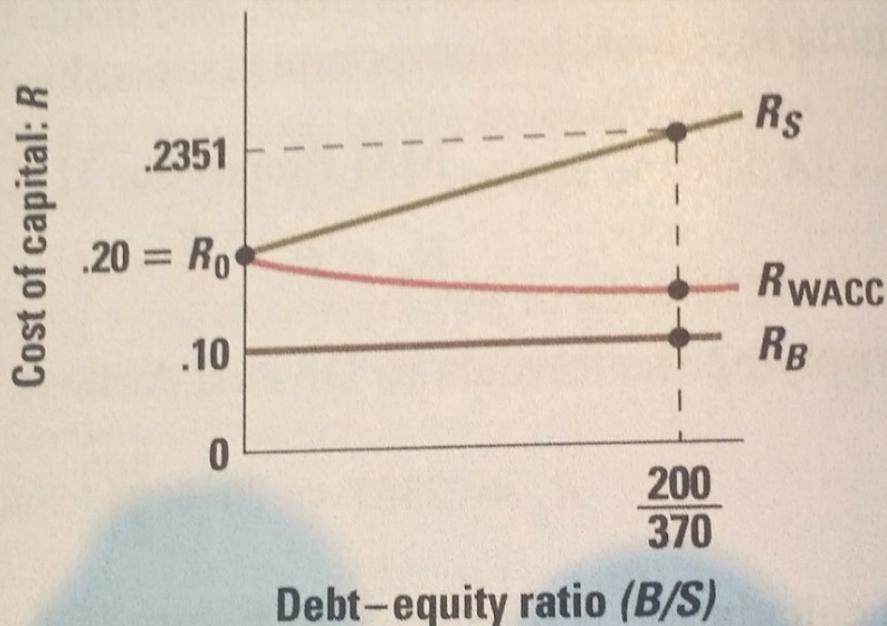
### Intuition

Proposition I: Because corporations can deduct interest payments but not dividend payments, corporate leverage lowers tax payments.

Proposition II: The cost of equity rises with leverage because the risk to equity rises with leverage.

## MM Proposition I (Corporate Taxes)

$$V_L = \frac{\text{EBIT} \times (1 - t_c)}{R_0} + \frac{t_c R_B B}{R_B} = V_U + t_c B$$



$$R_S = R_0 + (1 - t_c)(R_0 - R_B)B/S = .20 + \left( .65 \times .10 \times \frac{200}{370} \right) = .2351$$

Financial leverage adds risk to the firm's equity. As compensation, the cost of equity rises with the firm's risk. Note that  $R_0$  is a single point whereas  $R_S$ ,  $R_B$ , and  $R_{WACC}$  are all entire lines.