

# Corporate Finance

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## Chapter 1 Introduction to Corporate Finance

### 1. Balance-sheet model of the firm:

- I. **left-hand side of the sheet:** in what long-lived assets should the firm invest? – **capital budget.**
- II. **Right-hand side:** how can the firm raise cash for required capital expenditures? – **capital structure.**
- III. **Net working capital** = current asset – current liabilities: how should short-term operating cash flows be managed?

2. a firm sold gold for \$10 and has yet to collect from the customer. The cost is \$9:  
Income statement:

Accounting view: profit = 10-9=1

**Corporate finance view:** cash inflow = 0; cash outflow = -9.

### 3. the sole proprietorship\

- I. it is the cheapest business to form.
- II. It pays no corporate income taxes. All profits of the business are taxed as individual income.
- III. It has unlimited liability for business debts and obligations. No distinction is made b/w personal and business assets.

### 4. the partnership:

- I. Partnerships are usually inexpensive and easy to form.
- II. General partners have unlimited liability for all debts. The general partnership is terminated when a general partner dies or withdraws. It is difficult for a partnership to transfer ownership without dissolving.

The advantage is the cost of getting started. The disadvantages are: 1) unlimited liability, 2) limited life of the enterprise, and 3) difficulty of transferring ownership. These three disadvantages lead to 4) the difficulty of raising cash.

5. **the corporation:** limited liability, ease of ownership transfer, and perpetual succession are the major advantages; Disadvantage: government taxes corporate income.

6. **agency costs:** the cost of resolving the conflicts of interest b/w managers and shareholders are special types of costs.

**Residual losses** are the lost wealth of the shareholders due to divergent behavior of the managers.

7. G. Donaldson concluded that managers are influenced by **two basic motivations:**

- I. **survival.**
- II. **Independence and self-sufficiency:** this is the freedom to make decisions without encountering external parties or depending on outside financial markets. The Donaldson interviews suggested that **managers do not like to issue new shares of stock.** Instead, they like to be able to rely on internally generated cash flow.
- III. Therefore, **the basic financial objective of managers:** the maximization of corporate wealth. Corporate wealth is that wealth over which management has effective control. Corporate wealth is not necessarily shareholder wealth.

8. several control devices used by shareholders bond management to the self-interest of shareholders:
  - I. **shareholders control the directors**, who in turn select the management team;
  - II. **contracts with management and arrangements for compensation**, such as stock option plans, can be made so that management has an incentive to pursue the goal of the shareholders.
  - III. **Fear of a takeover** gives managers an incentive to take actions that will maximize stock prices.
  - IV. **Competition in the managerial labor market** may force managers to perform in the best interest of stockholders.

The available evidence and theory are consistent with the ideas of shareholder control and shareholder value maximization.
9. **Secondary markets:**
  - I. **Auction market:** the equity securities of most large US firms trade in organized auction markets. E.g. NYSE
  - II. Most debt securities are traded in **dealer markets**. Some stocks are traded in the dealer markets. When they are, it is referred to as the OTC market. E.g. NASDAQ

## Chapter 2 Accounting Statements and Cash Flow

1. **Balance sheet:**
  - I. The **assets** in the balance sheet are listed **in order by the length of time** it normally would take an ongoing firm to convert them to cash.
  - II. **The liabilities and the stockholders' equity** are listed in the order in which they must be paid.

| <b>Assets</b>                     | <b>Liabilities and Stockholders' equity</b> |
|-----------------------------------|---------------------------------------------|
| <b>Current assets</b>             | <b>Current liabilities</b>                  |
| cash and equivalents              | account payable                             |
| accounts receivable               | notes payable                               |
| inventories and other             | accrued expenses                            |
| Total current assets              | Total current liabilities                   |
| <b>Fixed assets</b>               | <b>Long-term liabilities</b>                |
| property, plant and equipment     | deferred taxes                              |
| Less accumulated depreciation     | Long-term debt                              |
| Net property, plant and equipment | Total Long-term liabilities                 |
| intangible assets and others      | <b>Stockholders' equity</b>                 |
| Total fixed assets                | preferred stock                             |
|                                   | common stock                                |
|                                   | capital surplus                             |
|                                   | accumulated retained earnings               |
|                                   | Less treasury stock                         |
|                                   | Total equity                                |
| <b>Total assets</b>               | <b>Total Liabilities and Stockholders'</b>  |

|  |               |
|--|---------------|
|  | <b>equity</b> |
|--|---------------|

- III. The more liquid a firm's assets, the less likely the firm is to experience problems meeting short-term obligations. But liquid assets frequently have lower rates of return than fixed assets.

2. **Income statement:**

|                                                  |
|--------------------------------------------------|
| Income statement                                 |
| <b>Total operating revenues</b>                  |
| (cost of goods sold)                             |
| (selling, general, and administrative expenses)  |
| (depreciation)                                   |
| <b>Operating income</b>                          |
| Other income                                     |
| <b>Earnings before interest and taxes (EBIT)</b> |
| (Interest expense)                               |
| <b>Pretax tax income</b>                         |
| (Taxes)                                          |
| Current:                                         |
| Deferred:                                        |
| <b>Net income</b>                                |
| Retained earnings:                               |
| Dividends:                                       |

3. **noncash items:** depreciation and deferred taxes. They appear in income statement according to GAAP, but they are not cash outflows.
4. the **statement of cash flows:** helps to explain the change in accounting cash and equivalents.

|                                                             |
|-------------------------------------------------------------|
| <b>Statement of cash flows</b>                              |
| Operations                                                  |
| Net income                                                  |
| Depreciation                                                |
| Deferred taxes                                              |
| Changes in current assets and liabilities (other than cash) |
| <b>Total cash flow from operations</b>                      |
| Investing activities                                        |
| Acquisition of fixed assets                                 |
| Sales of fixed assets                                       |
| <b>Total cash flow from investing activities</b>            |
| <b>Total cash flow from Financing activities</b>            |
| <b>Change in cash ( on the balance sheet)</b>               |

The difference b/w cash flow from Financing activities and total cash flow of the firm is interest expense.

5. the cash flows generated from the firm's assets = the cash flows to the firm's creditors and equity investors.

**CASH FLOW(A) = CASH FLOW(B) + CASH FLOW(S)**

| <b>Financial Cash flow/ free cash flow / total cash flow</b>              |                                                                  |
|---------------------------------------------------------------------------|------------------------------------------------------------------|
| Cash flow of the firm                                                     | Cash flow to investors in the firm                               |
| Operating cash flow (EBIT + depreciation – taxes)                         | Debt (interest + retirement of debt – long-term debt financing)  |
| (Capital spending) (acquisitions of fixed assets - sales of fixed assets) | Equity (dividends + repurchase of equity – new equity financing) |
| (addition to net working capital)                                         |                                                                  |
| Total =====                                                               | Total                                                            |

## 6. Financial ratios:

- I. **short-term solvency:** the ability of the firm to meet its short-run obligations.
  - a. **current ratio** = total current assets/ total current liabilities.
  - b. **Quick ratio** = quick assets/ total current liabilities.
- II. **activity:** the ability of the firm to control its investment in assets. The idea is to find out how effectively assets are used to generate sales.
  - a. **total asset turnover** = total operating revenues/ total assets(average)
  - b. **receivables turnover** = total operating revenues/Receivables (average)  
**average collection period** = Days in period/Receivables turnover
  - c. **inventory turnover** = cost of goods sold/inventory(average)  
**days in inventory** = Days in period/inventory turnover
- III. **Financial leverage:** the extent to which a firm relies on debt financing.
  - a. **debt ratios:** **debt ratio** = debt/assets; **debt-to-equity ratio;** **equity multiplier** = assets/ equity.
  - b. **Interest coverage** = EBIT/ interest expense
- IV. **Profitability:** the extent to which a firm is profitable. Problems: current profits can be a poor reflection of true future profitability. Accounting-based measures of profitability ignore risk and do not give us a benchmark for making comparisons.
  - a. **profit margin:** net (gross) profit margin= net income (EBIT)/ total operating revenues
  - b. **net (gross) ROA** = net income (EBIT)/average total assets.  
 ROA = profit margin x asset turnover
  - c. **ROE** = net income/ average stockholders' equity  
 ROE = profit margin x asset turnover x equity multiplier
  - d. **Payout ratio** = cash dividends/net income
  - e. **Retention ratio** = retained earnings/net income
- V. **Sustainable growth rate** = ROE x retention ratio. It is the maximum rate of growth a firm can maintain w/o increasing its financial leverage and using internal equity only.
- VI. **Value:** the value of the firm.

- a. **P/E ratio**
- b. **Dividend yield** = dividend per share/ market price per share.  
Firms with high growth prospects will generally have lower dividend yields.
- c. **Market-to-book value**
- d. **Tobin's Q** = the market value of all the debt + equity/ the replacement value of the assets. If a firm has a Q ratio above 1 it has an incentive to invest that is probably greater than a firm with a Q ratio below 1. Firms with high Q ratios tend to be those firms with attractive investment opportunities or a significant competitive advantage.

## Chapter 3 Financial Markets and NPV: First Principles of Finance

- Financial markets exist b/c people want to adjust their consumption over time. They do this by borrowing and lending.
- The **financial markets provide a benchmark** against which proposed investments can be compared, and **the interest rate is the basis for a test that any proposed investment must pass**. The financial markets give the individual, the corporation, or even the government a standard of comparison for economic decisions.
- Regardless of the individual's preference for consumption this year versus the next, regardless of how patient or impatient the individual is, **making the proper investment decision depends only on comparing it with the alternatives in the financial markets**.
- Not only does the NPV rule tell us which investments to accept and which to reject, the financial markets also provide us with the tools for actually acquiring the funds to make the investments. In short, we use the financial markets to decide both what to do and how to do it.

## Chapter 4 Net Present Value

- A useful formula

$$A = a + aq + aq^2 + aq^3 + \dots + aq^n \quad (1)$$

$$qA = aq + aq^2 + aq^3 + \dots + aq^n + aq^{n+1} \quad (2)$$

(1) - (2) :

$$A = \frac{a - aq^{n+1}}{1 - q} = \frac{a - q * aq^n}{1 - q}$$

Let  $A_1 = a$ , the first term;  $A_n = aq^n$ , the last term, then

$$A = \frac{A_1 - q * A_L}{1 - q} \quad (3)$$

If  $|q| < 1$ , then when  $n \rightarrow \infty$ ,  $A_L = aq^n = 0$ , then

$$A = \frac{A_1}{1 - q} \quad (4)$$

## 2. Applications of the formula

Equation (3) is the basis for nearly all the basic formula we have known.

### I. Perpetuity.

$A_1 = \frac{c}{1+r}$ ,  $q = \frac{1}{1+r} < 1$ ,  $A_L = aq^n = 0$ , put them into (4), we get:  $A = \frac{c}{r}$ .

### II. Annuity

$A_1 = \frac{c}{1+r}$ ,  $q = \frac{1}{1+r} < 1$ ,  $A_L = \frac{c}{(1+r)^T}$ , plug them into (3), we get:

$$A = \frac{c}{r} \left( 1 - \frac{1}{(1+r)^T} \right)$$

### III. Growing annuity

$A_1 = \frac{c}{1+r}$ ,  $q = \frac{1+g}{1+r}$ ,  $A_L = \frac{c(1+g)^{T-1}}{(1+r)^T}$ , Plug them into (3), we get:

$$A = \frac{c}{r-g} \left( 1 - \left( \frac{1+g}{1+r} \right)^T \right)$$

## Chapter 5 How to Value Bonds and Stocks

1. Pure discount bonds (zero coupon, bullet); level-coupon bonds; consol (a perpetuity).
2. an estimate of the growth rate of a stock  **$g = \text{Retention ratio} \times \text{Return on retained earnings}$** .
3. dividend-growth model:  $P = \text{Div}/(r - g)$
4. NPVGO model:  $P = \text{EPS}/r + \text{NPVGO}$
5. **only dividends** reach the stockholders and only they, **not earnings, should be discounted to obtain share price.**

6. P/E ratio is a function of three factors:
  - I. The per share amount of the firm's valuable growth opportunities. Firms with many growth opportunities have high P/E.
  - II. The risk of the stock. **The higher the risk, the lower the P/E.**
  - III. The type of accounting method used by the firm. **Firms with conservative accountants have high P/E.**

## Chapter 6 Some Alternative Investment Rules

1. NPV has three attributes:
  - I. NPV uses cash flows in stead of earnings;
  - II. NPV uses all the cash flows of the project;
  - III. NPV discounts the cash flows properly.
2. **Payback period rule:**

It doesn't consider the timing of the cash flows within the payback period; it ignores all cash flows occurring after the payback period; Arbitrary standard for payback period.
3. **Average accounting rule = average project earnings after taxes and depreciation/average book value of the investment during its life.**

It uses net income instead of cash flow; AAR takes no account of timing; AAR offers no guidance on what the right-targeted rate of return should be.
4. IRR always reaches the same decision as NPV in the normal case where the initial outflows of an independent investment project are only followed by a series of inflows.
5. Problems of IRR:
  - I. Some projects have cash inflows followed by one or more cash outflows. IRR rule is inverted here: one should accept when the IRR is below the discount rate.
  - II. Some projects have **a number of changes of sign** in their cash flows. Here, there are likely to be multiple internal rates of return. The practitioner must use NPV here.
6. For mutually exclusive projects:

Either due to differences in size or in timing, the project with the highest IRR need not have the highest NPV. Hence, the IRR rule should not be applied. However, we can calculate incremental cash flows.
7. **Profitability index** =  $\text{PV of cash flows subsequent to initial investment} / \text{initial investment}$ 
  - I. Accept an independent project if  $PI > 1$ ; Reject if  $PI < 1$
  - II. PI ignores differences of scale for mutually exclusive projects;



- III. Capital rationing: in the case of limited funds, we cannot rank projects according to their NPVs. Instead, we should rank them according to PI rule.

## Chapter 7 NPV and Capital Budgeting

1. In calculating the NPV of a project, only cash flows that are incremental to the project should be used. We are interested in the difference b/w the cash flows of the firm with the project and the cash flows of the firm w/o the project;
2. We should **ignore sunk costs**, which are not incremental cash outflows. Once the company incurred the expense, the cost became irrelevant for any future decision.
3. Take **opportunity costs and side effects** into account. **The most important side effect is erosion.** Erosion is the cash flow transferred to a new project from customers and sales of other products of the firm.
4. There are two sets of books: one for the IRS (**the tax books**) and another for its annual report (**the stockholders' books**). The tax books follow the rules of the IRS. The stockholders' books follow the rules of the Financial Accounting Standards Board (FASB). The two sets of rules differ widely in certain areas. For example, income on municipal bonds is ignored for tax purposes while being treated as income by the FASB. **We are interested in the IRS rules. Our purpose is to determine net cash flow, and tax payments are a cash outflow.** The FASB regulations determine the calculation of accounting income, not cash flow.
5. An investment in NWC arises whenever (1) raw materials and other inventory are purchased prior to the sale of finished goods, (2) cash is kept in the project as a buffer against unexpected expenditures, and (3) credit sales are made, generating accounts receivable rather than cash. This **investment in NWC represents a cash outflow**; b/c cash generated elsewhere in the firm is tied up in the project.
6. In the real world, firms typically calculate a project's cash flows under the assumption that the project is financed only with equity. Any adjustments for debt financing are reflected in the discount rate, not the cash flows.
7. Real interest rate =  $(1 + \text{nominal interest rate}) / (1 + \text{inflation rate}) - 1$
8. **Nominal cash flows must be discounted at the nominal rate.** Real cash flows must be discounted at the real rate. **Both methods must always give the same NPV.**
9. When a firm must choose b/w two machines of unequal lives, the firm can apply either the **matching cycle approach** or the **equivalent annual cost approach**.

Since both approaches are different ways of presenting the same info, the same machine must be preferred under both approaches.

## Chapter 8 Strategy and Analysis in Using NPV

1. **Standard sensitivity analysis** calls for an NPV calculation for all the possibilities of a single variable, along with the expected forecast for all other variables. **(Modify only one variable at a time)**
2. **Scenario analysis** considers the joint movement of the different factors under different scenarios (e.g. war breaking out or oil prices skyrocketing)
3. **Break-even analysis** is frequently performed on an accounting profit basis, a NPV basis more appropriate. Break-even analysis only works with the expected or best estimates of these variables.
4. There are often **hidden options** in doing discounted cash flow analysis of capital budgeting. Both option to expand and option to abandon have values.

## Chapter 9 Capital Market Theory

5. The returns that shareholders can expect to obtain in the capital markets are the ones they will require from firms when the firms evaluate risky investment projects. The shareholders' required return is the firm's cost of equity capital.
6. In a world where (a) a project has the same risk as the firm, and (b) the firm has no debt, the expected return on the stock should serve as the project's discount rate, which can be taken from CAPM.

## Chapter 10 Return and Risk: CAPM

1. An individual who **holds one (only one) security should use** expected return as the measure of the security's return. **Standard deviation or variance is the proper measure of the security's risk.** An individual who **holds a diversified portfolio** cares about the contribution of each security to the expected return and the risk of the portfolio. Neither the security's variance nor the security's standard deviation is an appropriate measure of a security's contribution to the risk of a portfolio. **The contribution of a security to the risk of a portfolio is best measured by beta.**

2.  $\text{Corr}(R_1, R_2) = \text{Cov}(R_1, R_2) / (\text{Std1} \times \text{std2})$ . If the correlation is positive, the variables are positively correlated.
3. As long as  $\text{correlation} < 1$ , the standard deviation of a portfolio of two securities is less than the weighted average of the standard deviations of the individual securities. B/c of diversification!!!
4. **Opportunity/feasible set:** backward bending: always occurs if  $\text{correlation} \leq 0$ ; it may or may not occur when  $\text{correlation} > 0$ . **Efficient set/frontier:** the part of feasible set above **minimum variance portfolio**. The **diversification effect rises as correlation declines**.
5. The **variance of the return on a portfolio** with many **securities is more dependent on the covariance** b/w the individual securities than on the variances of the individual securities.
6. **Homogeneous expectations:** all investors have the same beliefs concerning returns, variances, and covariances. But all investors may have different aversion to risk.
7. **in a world with homogeneous expectations, all investors would hold the same market portfolio**, which is a market-value-weighted portfolio of all existing securities.
8. Beta measures the responsiveness of a security to movements in the **market portfolio**. Virtually no stocks have negative betas.
 
$$\beta_i = \frac{\text{Cov}(R_i, R_M)}{\sigma^2(R_M)}$$
9. **CAPM:**  $E(R_i) = R_F + \beta_i \times (E(R_M) - R_F)$
10. Security market line (SML) holds both for all individual securities and for all possible portfolios.

## Chapter 11      An Alternative View of Risk and Return: APT

1. CAPM VS. APT:
  - I. The differences b/w the two models stem from the APT's treatment of interrelationship among the returns on securities. **APT assumes that returns on securities are generated by a number of industrywide and marketwide factors**. Correlation b/w a pair of securities occurs when these two securities are affected by the same factor or factors. By contrast, though the CAPM allows correlation among securities, it does not specify the underlying factors causing the correlation.

- II. **CAPM** usually assumes either that the returns on assets are **normally distributed** or that **investors have quadratic utility functions**. APT doesn't require either assumption.
  - III. Both the APT and the CAPM imply a positive relationship b/w expected return and risk. The APT allows this relationship to be developed in a particularly intuitive manner. In addition, the APT views risk more generally than just the standardized covariance or beta of a security with the market portfolio.
  - IV. CAPM has a thorough discuss of efficient sets. **APT adds factors until the unsystematic risk of any security is uncorrelated with the unsystematic risk of every other security.**
2. what will determine a stock's return in, say, the coming month?
- I. **the return on any stock consists of two parts:** first, the normal or **expected return**; second, the **uncertain** or risky return on the stock.  

$$R = \bar{R} + U$$
  - II. When we **discount an announcement** or a news item in the future, we mean that it has less impact o the market b/c the market already knew much of it.
  - III. Any announcement can be broken into two parts:  
**Announcement = Expected part + Surprise**
  - IV. When we speak of **news**, then, we **refer to the surprise part of any announcement.**
3. Risk: Systematic and Unsystematic
- I. **the unanticipated part of the return** – that portion resulting from surprise – is **the true risk** of any investment.
  - II. We can divide risks into two components: **a systematic risk and specific/unsystematic risk.**
  - III. A systematic risk is any risk that affects a large number of assets, each to a greater or lesser degree.
  - IV. An unsystematic risk is a risk that specifically affects a single asset or a small group of assets.
  - V.  $R = \bar{R} + U = \bar{R} + m + \varepsilon$ , Where m: systematic/market risk,  $\varepsilon$  unsystematic risk.
4. Systematic risk and betas
- I. **Unsystematic parts of the returns on two stocks are unrelated to each other.**
  - II. Since stocks are influenced by the same systematic risks, individual companies' systematic risks and therefore their total returns will be related.
  - III. We capture the influence of a systematic risk like inflation on a stock by using the beta coefficient.

IV. **K- factor model:**  $R - \bar{R} = \sum_{i=1}^k \beta_i F_i + \varepsilon$ , where F stands for a surprise of a factor.

V. Market model:  $R = \bar{R} + \beta(R_M - \bar{R}_M) + \varepsilon$

#### 5. Portfolios:

I.  $R_i = \bar{R}_i + \beta_i F + \varepsilon_i$  ---- for a single security;

II.  $R_p = X_1 \bar{R}_1 + X_2 \bar{R}_2 + X_3 \bar{R}_3 + \dots X_N \bar{R}_N$   
**(Weighted Average of Expected Returns)**  
 $+(X_1 \beta_1 + X_2 \beta_2 + X_3 \beta_3 + \dots X_N \beta_N) F$   
**(Weighted average of Betas) F**  
 $+X_1 \varepsilon_1 + X_2 \varepsilon_2 + X_3 \varepsilon_3 + \dots X_N \varepsilon_N$   
**(Weighted average of unsystematic risks)**

There is no uncertainty in the first row. Uncertainty in the second row is reflected by only one item, F. **though the expected value of F is zero**; we do not know what its value will be over a particular time period.

**The third row actually disappears** in a large portfolio.

Systematic risk arises from a common factor F.

#### 6. Betas and Expected Returns

- I. **Relevant risk in large and well-diversified portfolios is all systematic b/c unsystematic risk is diversified away.** Therefore, when a well-diversified shareholder considers changing her holdings of a particular stock, she can ignore the security's unsystematic risk.
- II. Every security or portfolio lies on the SML.

## Chapter 12 Risk, cost of Capital, and Capital Budget

1. A project should be undertaken only if its expected return is greater than that of a financial asset of comparable risk. Therefore, **the discount rate of a project should be the expected return on a financial asset of comparable risk.**

#### 2. Determinants of Beta

The **beta of a stock is determined** by the characteristics of the firm: **the cyclical nature of revenue, operating leverage, and financial leverage.**

##### I. Cyclical nature of revenue

The revenues of some firms, e.g. high-tech firms, retailers, and automotive firms, are quite cyclical. **Highly cyclical stocks have high betas.**

**Cyclicity is different from variability.** For instance, a movie-making firm has highly variable revenues but pretty independent of business cycle. Stocks with high standard deviations need not have high betas.

##### II. Operating leverage

OL = change in EBIT/EBIT x (sales/change in sales). It measures the percentage change in EBIT for a given percentage change in sales or revenues. **OL increases as fixed costs rise and as variable costs fall.**

The cyclical nature of a firm's revenues is a determinant of the firm's beta. Operating leverage magnifies the effect of cyclical nature on beta. Business risk is generally defined as the risk of the firm without financial leverage. Business risk depends both on the responsiveness of the firm's revenues to the business cycle and on the firm's operating leverage.

Although the preceding discussion concerns firms, it applies to projects as well. **Those projects whose revenues appear strongly cyclical and whose operating leverage appears high are likely to have high betas. This approach is qualitative in nature.** Because start-up projects have little data, quantitative estimates of beta generally are not feasible.

### III. Financial leverage

a. don't confuse with  $r_s$  (**cost of equity capital, to be get from SML**),  $r_{WACC}$  and  $r_0$ .

Similar firms (in the same risk group) with different corporate structure have the same  $r_0$  (the cost of capital if both firms are all-equity firms), but they usually don't have the same  $r_s$  and  $r_{WACC}$ . If we know firm 1's  $r_s$  and want to get firm 2's  $r_{WACC}$  or  $r_s$ , we have to get  $r_0$  first, which is the bridge between two firms (refer to example on page 476-8).

b. **Asset beta, the beta of the assets of a levered firm; to be thought of as the beta of the common stock had the firm been financed only with equity.**

$$\beta_{Equity} = \beta_{Asset} \left(1 + \frac{Debt}{Equity}\right)$$

$$\beta_{Equity} = \beta_{Asset} \left[1 + (1 - T_c) \frac{Debt}{Equity}\right]$$

- c. **if a project's beta differs from that of the firm, the project should be discounted at the rate commensurate with its own beta.** Unless all projects in the corporation are of the same risk, choosing the same discount rate for all projects is incorrect.
- d. The new venture should be assigned a somewhat higher beta than that of the industry to reflect added risk.

e.  $r_{WACC} = \frac{B}{V} r_B (1 - T_c) + \frac{S}{V} r_s$  **B and S are market values**

### 3. Reducing the Cost of Capital

- I. **Expected return and cost of capital are negatively related to liquidity.** Although it is quite difficult to lower the risk of a firm, it is much easier to increase the liquidity of the firm's stock.
- II. **Liquidity: those stocks that are expensive to trade are considered less liquid than those that trade cheaply.** Three costs: **brokerage, the bid-ask spread, and market-impact costs.**
- III. Market-impact costs: the price drop associated with a large sale and the price rise associated with a large purchase.
- IV. B/c the expected return to the investor is the cost of capital to the firm, the cost of capital is positively related to beta. **Investors demand a high expected return when investing in stocks with high trading costs, i.e., low liquidity.** And, **this high expected return implies a high cost of capital to the firm.**
- V. Bid-ask spread and adverse selection: **the spread should be positively related to the ratio of informed to uninformed traders.** That is, **informed traders will pick off the specialist and uninformed traders will not.** Informed traders in a stock raise the required return on equity, thereby increasing the cost of capital.
- VI. **Firms should try to bring in more uninformed investors.** Stock splits may be a useful tool. Thereby bringing more small and uninformed investors into the firm, the adverse selection costs are reduced, allowing the specialist to lower the bid-ask spread. Secondly, **firms can disclose more info.** This narrows the gap b/w uninformed and informed investors, thereby lowering the cost of capital. Thirdly, **friendliness toward security analysts** would be very helpful. It is simply to interest the analysts in following the company, thereby reducing the information asymmetry.

## Chapter 13 Corporate-financing Decisions and Efficient Capital Market

7. As with capital budgeting decisions, the firm seeks to create value with its financing decisions. To do this the firm **must find positive NPV financing arrangements.** However, financial markets do not provide as many opportunities for positive NPV transactions as do nonfinancial markets. The **sources of NPV in financing are taxes, bankruptcy costs, and agency costs.**
8. Typical financing decisions include how much debt and equity to sell, what types of debt and equity to sell, and when to sell them.
9. There are basically three ways to create valuable financing opportunities:
  - a. Fool investors (investors cannot easily be fooled).
  - b. Reduce costs or increase subsidies.

- c. Create a new security. The value captured by the innovator is small in the long run b/c the innovator usually cannot patent or copyright his idea.

#### 10. the **weak form efficiency**

- a. if a market fully incorporates the info in past stock prices.
- b.  $P_t = P_{t-1} + \text{Expected return} + \text{Random error}_t$   
The expected return is a function of a security's risk and would be based on the models of risk and return in previous chapters. The random component is due to new info on the stock.  
**The random component in any one period is unrelated to the random component in any past period.** (follow a random walk)
- c. **We deny technical analysis:** which refers to attempts to predict the future from the patterns of past price movement.

#### 11. the **semistrong** and **strong forms** efficiency

- a. A market is semistrong-form efficient if prices **reflect (incorporate) all publicly available info.**
- b. A market is **strong-form** efficient if prices **reflect all info**, public or private.
- c. It seems reasonable to assume that the **market is semistrong-form efficient.**

#### 12. EMH

- a. All the EMH really says is that, on average, the manager will not be able to achieve an abnormal or excess return. It is wrongly argued that market efficiency means that it does not matter what you do because the efficiency of the market will protect the unwary. What efficiency does say is that **the price that a firm will obtain when it sells a share is a fair price in the sense that it reflects the value of that stock given the info that is available about it.** Shareholders need not worry that they are paying too much for a stock with a low dividend or some other characteristic; b/c the market has already incorporated it into the price. However, investors still have to worry about such things as their level of risk exposure and their degree of diversification.
- b. The stock price can reflect the available info even if many stockholders never follow the stock and are not considering trading in the near future, and even if some stockholders trade with little or no info.

#### 13. The Evidence

- a. **Serial correlation of one security test supports weak form efficiency.**
- b. Info in any one time period affects only that period's abnormal return.  
**Event studies are statistical studies that examine whether the release of info influences returns on other days.** The event-study



tests generally support the view that the market is semistrong-form efficient.

- c. Mutual funds, on average, do not beat broad-based indices. This finding is consistent with semi-strong-form and weak-form efficiency. This does not imply that mutual funds are bad investments for individuals. They do permit the investor to buy a portfolio that has a large number of stocks in it.
- d. Studies support the view that **insider trading were abnormally profitable**. Thus, **strong-form efficiency does not seem to be substantiated by the evidence**.

#### 14. Accounting and efficient markets:

- a. **Accounting choice should not affect stock price if two conditions hold.** First, enough info must be provided in the annual report so that financial analysts can construct earnings under the alternative accounting methods. Second, the market must be efficient in the semistrong form.
- b. Kaplan and Roll (1972) found that the switch from accelerated to straight-line depreciation generally did not significantly affect stock prices.
- c. Sloane (1996): Earnings = cash flow + Accruals. Accountants have long argued that the “quality” of earnings is high for firms with low accruals, while the quality of earnings is low for firms with high accruals. **Sloane finds that the one-year stock returns on firms that recently had a reduction in accruals is quite high, while the one-year returns on firms experiencing an increase in accruals is negative.** This suggests that investors react slowly to this type of accounting info.(??)

#### 15. The timing decision

- a. EMH implies that stock is always sold for its true worth, the timing decision becomes unimportant.
- b. Loughran and Ritter (1995) present evidence that annual returns over the five years following an IPO are, on average, approximately 7% less for the issuing company than the return on a non-issuing company of similar market capitalization. Over the 5 years following an SEO, the annualized return on the issuing firm’s stock is, on average, 8% less than the return on a comparable nonissuing company. This paper suggests that **corporate managers issue stock when it is overpriced. In other words, they are successfully able to time the market.**
- c. Ikenberry, et, al (1995) find that stock returns of repurchasing firms are abnormally high in the two years following the repurchase, suggesting that timing is effective here.

#### 16. Price-pressure effects

- a. **If capital markets are efficient, a firm should be able to sell as many shares as it desires without depressing the price.**
- b. Scholes (1972) found that the market's ability to absorb large blocks of stock was virtually unlimited.
- c. **Keim and Madhavan (1996) find that the stock price drops, on average about 3.66% from the closing trade on the previous day to the block trade itself.** However, the stock rebounds by 1.86% by the close of the day after the block trade. **They argue that the difference of 1.8% reflects the market's belief that the block seller has special (negative) info concerning the stock.** This drop in price and subsequent rebound of 1.86% is evidence of price pressure.

## Chapter 14 Long-Term Financing: An Introduction

### 1. Common Stock

- I. There is usually a stated value on each stock certificate called the **par value**. The total par value is the number of shares issued multiplied by the par value of each share and is referred to as the **dedicated capital** of a corporation.
- II. **Capital surplus:** refers to amounts of directly contributed equity capital in excess of the par value. In most states the par value is locked in and cannot be distributed to stockholders except upon the liquidation of the corporation.
- III. The shares bought back are called **treasury stock**.
- IV. **Cumulative voting:** the effect of it is to permit minority participation. **Straight voting can freeze out minority shareholders; that is the reason many states have mandatory cumulative voting.**
- V. **The payment of dividends is at the discretion of the board of directors.** The payment of dividends is not a business expense. Dividends are paid out of after-tax profits of the corporation. Dividends received by individual shareholders are for the most part considered ordinary income by the IRS and are fully taxable.
- VI. Harry and Linda DeAngelo (1985) found that **managements' holdings of common stock are usually tilted toward the stock with the superior voting rights.** Lease, McConnell, and Mikkelsen (1983) found the **market prices of stocks with superior voting rights to be about 5% higher than the prices of otherwise identical stocks with inferior voting rights.**

### 2. Corporate long-term debt:

- I. The payment of interest on debt is considered a cost of doing business and is fully tax-deductible. Because interest expense can be used to reduce taxes, the government is providing a direct tax subsidy on the use of debt when compared to equity.

- II. When corporations try to create a debt security that is really equity, they are trying to obtain the tax benefits of debt while eliminating its bankruptcy costs.
- III. Long-term debt almost always has a par value equal to the face value, and debt price is often expressed as a percentage of the par value.
- IV. **A debenture is an unsecured corporate debt**, whereas a bond is secured by a mortgage on the corporate property. However, in common usage the word Bond often refers to both secured and unsecured debt. **A note usually refers to an unsecured debt with a maturity shorter than that of a debenture**, perhaps under 10 years.
- V. Repayment: long-term debt is typically repaid in regular amounts over the life of the debt. The payment of long-term debt by installment is called **amortization**. At the end of the amortization the entire indebtedness is said to be **extinguished**.
- VI. **Indenture**: the written agreement b/w the corporate debt issuer and the lender, setting forth maturity date, interest rate, and all other terms, is called an indenture.

### 3. Preferred stock:

- I. Preferred shares have a stated liquidating value, usually \$100 per share. The dividend per share is described in terms of dollars per share.
- II. **The board of directors may decide not to pay the dividends on preferred shares.** Dividends payable on preferred stock are either cumulative or noncumulative. Usually both the cumulated preferred dividends plus the current preferred dividends must be paid before the common shareholders can receive anything.
- III. **Unlike debt, preferred stock dividends cannot be deducted as interest expense when determining taxable corporate income.** For individual investors, preferred dividends are ordinary income for tax purpose. **For corporate investors, 70% of the amounts are exempt from income taxes.** Therefore, **most preferred stock in US is owned by corporate investors.**

### 4. Patterns of financing:

- I. Firms use cash flow for capital spending and NWC. Historically, U.S. firms have spent about 80% of cash flow on capital spending and 20% on NWC.
- II. Internal financing comes from **internally generated cash flow and is defined as net income plus depreciation minus dividends.**
- III. Internally generated cash flow has dominated as a source of financing **(70-90% of total long-term financing).**
- IV. In general, the financial deficit is covered by borrowing and issuing new equity. However, **new issues of equity in the aggregate seem to be unimportant.** Net new issues of equity typically account for a small part of total financing; in the late 1980s and 1990s, this figure was negative.

- V. **Firms in US generate more financing from internally generated cash flow than firms in other countries.**
- 5. Recent trends in Capital Structure
  - I. **U.S. firms from 1984 to 1990 and after 1993 issued large amounts of new debt to finance the retirement of shares of stock.**
  - II. Did the capital structure of firms change significantly during these periods? **If we use book values, the answer would be yes. If we used market values, this would not have been the case. In fact, the market debt ratio is remarkably stable over time and has trended downward in recent years.**
  - III. In general, financial economists prefer the use of market values when measuring debt ratios.

## Chapter 15 Capital Structure: Basic Concepts

1. **The value of the firm = market value of the debt + the market value of the equity.**
2. Changes in capital structure benefit the stockholders iff the value of the firm increases. Managers should choose the capital structure that they believe will have the highest firm value b/c this capital structure will be most beneficial to the firm's stockholders.
3. **MM proposition I (no taxes):** the value of the levered firm is the same as the value of the unlevered firm. If levered firms are priced too high, rational investors will simply borrow on their personal accounts to buy shares in unlevered firms. This substitution is oftentimes called **homemade leverage**. As long as individuals borrow (and lend) on the same terms as the firms, they can duplicated the effects of corporate leverage on their own.
4. **No taxes: MM I implies that  $r_{WACC}$  is a constant for a given firm, regardless of the capital structure.** Let  $r_0$  be the cost of capital for an all-equity firm.  $r_{WACC} = r_0$ .
5. **MM Proposition II (no taxes):**  $r_s = r_0 + \frac{B}{S}(r_0 - r_B)$ . The required return on equity is a linear function of the firm's debt-to-equity ratio.
6. **Market value balance sheet:** Accountants value items in terms of historical cost, whereas financial people value items in terms of market value.
7. **MM I implies that firms' debt-equity ratios could be anything.** They are what they are b/c of whimsical and random managerial decisions about how much to borrow and how much stock to issue. However, in the real world, almost any industry has a debt-to-equity ratio to which companies in that industry adhere.

## 8. Taxes:

- I. **Tax shield** = corporate tax rate X dollar amount of interest  

$$= T_C \times r_B \times B$$

As long as the firm expects to be in a positive tax bracket, we can assume that the cash flow from tax shield has the same risk as the interest on the debt.

- II. Present value of the tax shield is  $= T_C B$ , by assuming that the cash flows are perpetual.

III. **MM Proposition I (corporate taxes):**

$$V_L = \frac{EBIT \times (1 - T_C)}{r_0} + \frac{T_C r_B B}{r_B} = V_U + T_C B$$

, where  $r_0$  is the cost of capital to an all-equity firm, it now discounts after-tax cash flows.

**The value of the levered firm is the value of an all-equity firm plus the present value of the tax shield.**

IV. **MM Proposition II (corporate taxes):**

$$r_s = r_0 + \frac{B}{S} (1 - T_C) (r_0 - r_B), \quad S = \frac{(EBIT - r_B B) \times (1 - T_C)}{r_s}$$

- V.  $r_{WACC} = \frac{B}{V} r_B (1 - T_C) + \frac{S}{V} r_s$ ,  $r_{WACC}$  declines with leverage in a world with corporate taxes.

- VI. When a firm lowers its  $r_{WACC}$ , the firm's value will increase:

$$V_L = \frac{EBIT \times (1 - T_C)}{r_{WACC}}$$

## Chapter 16 Capital Structure: Limits to the Use of Debt

### 1. Costs of Financial Distress:

The possibility of bankruptcy has a negative effect on the value of the firm. However, **it is not the risk of bankruptcy itself that lowers value. Rather it is the costs associated with bankruptcy that lower value.**

If bondholders are paying a fair price if they are realistic about both the probability and the cost of bankruptcy. **It is the stockholders who bear these future bankruptcy costs.**

### 2. Description of Costs:

- I. **Direct costs** of financial distress: **legal and administrative costs** of liquidation or reorganization.
- II. **Indirect costs** of financial distress: **impaired ability to conduct business**. Andrad and Kaplan (1998) estimate total distress costs to be b/w 10% and 20% of firm value.

- III. **Agency costs: conflicts of interest b/w stockholders and bondholders.**
  - a. **Incentive to take large risks when near bankruptcy.**  
Stockholders expropriate value from the bondholders by selecting high-risk projects.
  - b. **Incentive toward underinvestment:** in both a and b, leverage results in distorted investment policy. Whereas the unlevered corporation always chooses projects with positive NPV, the levered firm may deviate from this policy.
  - c. **Milking the property:** pay out extra dividends or other distributions in times of financial distress.
  - d. It is ultimately the stockholders who pays for the cost of selfish investment strategies, because bondholders protect themselves accordingly by raising the interest rate that they require on the bonds.
3. **How to reduce the costs of debts:**
  - I. **Protective covenants:** are incorporated as part of the indenture in hopes of lower rates. Negative and positive covenants. Smith and Warner (1979) found that **91% of the bond indentures included covenants that restricted the issuance of additional debt**, 23% restricted dividends, 39% restricted mergers and 36% limited the sale of assets. **Protective covenants should reduce the costs of bankruptcy, ultimately increasing the value of the firm.** Thus, stockholders are likely to favor all reasonable covenants. They can be the lowest-cost solution to the stockholder-bondholder conflict.
  - II. **Repurchase of debt prior to bankruptcy**
  - III. **Consolidation of debt.**
4. Integration of tax effects and financial distress costs:
  - I. **Static trade-off theory:** a firm's capital structure decisions can be thought of as a trade-off b/w the tax benefits of debt and the costs of financial distress.
  - II. The implication is that **there is an optimum amount of debt for any individual firm (debt capacity).**
  - III. Total value of the firm = market claims (debt + equity) + non-marketed claims (taxes, potential lawsuits and bankruptcy claims). Marketed claims can be bought and sold in financial markets, and the non-marketed claims cannot.
5. **Shirking, perquisites, and bad investments:** a note on **agency cost of equity:**
  - I. **Adam Smith:** "the directors of such companies, however, being the managers of other people's money than of their own, it cannot well be expected that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. In short, an individual will work harder for a

firm if she is one of its owners than if she is just an employee. In addition, the individual will work harder if she owns a large percentage of the company than if she owns a small percentage.

- II. **By issuing new equity, the owner-manager is likely to shirk**, obtain more perquisites and take on capital-budgeting projects with negative NPV (managerial salaries generally rise with firm size). It is our opinion that **losses from accepting bad projects are far greater than losses from either shirking or excessive perquisites.**
- III. **LBOs significantly reduce the above cost of equity.**
- IV. **Extended static trade-off model:** when debt is substituted for equity, the change in the value of the firm is **1) the tax shield on debt plus 2) the reduction in the agency costs of equity minus 3) the increase in the costs of financial distress (including the agency costs of debt).** The optimal debt-equity ratio would be higher in a world with agency costs of equity than in a world without these costs.
- V. **Free cash flow hypothesis (Jensen (1986)):** we might expect to see more wasteful activity in a firm with a capacity to generate large cash flows than in one with a capacity to generate only small flows. It implies that a shift from equity to debt will boost firm value, because debt reduces the opportunity for managers to waste resources. Dividends also reduce free cash flow. **According to this hypothesis, an increase in dividends should benefit the stockholders by reducing the ability of managers to pursue wasteful activities.**

#### 6. **The Pecking-order theory:**

- I. The key of timing is **asymmetric info**; the manager must know more about his firm's prospects than does the typical investor.
- II. **Pure pecking-order theory:** to issue debt instead of equity when the stock is undervalued; to issue debt also when the firm is overvalued. In fact only the most over-valued firms have any incentive to issue equity. Thus, the end result is that virtually no one will issue equity.
- III. **This pure version assumes that timing is the financial manager's only consideration. In reality**, a manager must consider taxes, financial distress costs, and agency costs as well. Thus, a firm may issue debt only up to a point. If financial distress becomes a real possibility beyond that point, the firm may issue equity instead.
- IV. **Rules of the pecking order:**
  - a. **Use internal financing:** if outside financing is required, debt should be issued before equity. Only when the firm's debt capacity is reached should the firm consider equity.
  - b. **Issue the safest securities first.**
- V. **Pecking-Order vs. trade-off:**
  - a. There is no target amount of leverage in PO: In TO, the optimal amount of leverage occurs where the marginal benefit of debt equals the marginal cost of debt. In PO, the amount of leverage is

determined by the happenstance of available projects. Firms do not pursue a target ratio of debt to equity.

- b. **Profitable firms use less debt in PO:** profitable firms generate cash internally, implying less need for outside financing. Because firms desiring outside capital turn to debt first, **profitable firms end up relying on less debt. The TO doesn't have this implication.** The greater cash flow of more profitable firms creates greater debt capacity. These firms will use that debt capacity to capture the tax shield and the other benefits of leverage.

7. Growth and the debt-equity ratio:

- I. Berens and Cuny (1995) argue that **growth implies significant equity financing, even in a world with low bankruptcy costs.**
- II. 100% debt financing is suboptimal, holds whether growth opportunities and/or inflation is present.
- III. **High-growth firms will have lower debt ratios than low-growth firms.**

8. Personal taxes:

- I. Effective personal tax rate on distributions to stockholders is likely to be **below** the personal tax rate on interest.
- II. Interest receives a tax deduction at the corporate level. **Equity distributions may be taxed at a lower rate (by using stock dividends) than interest at the personal level.** Total tax at all levels may either increase or decrease with debt, depending on the tax rates in effect.
- III. Miller model:

$$V_L = V_U + \left[1 - \frac{(1 - T_C) \times (1 - T_S)}{1 - T_B}\right] B$$
,  $T_B$  is the personal tax rate on ordinary income, such as interest, and  $T_S$  is the personal tax rate on equity distributions.

IV. Critics of the model:

- a. **Tax rates in the real world:** Graham (1999) finds that for almost every year of his sample period of 1980-1994, the personal tax rate disadvantage of debt reduce, but does not eliminate, the corporate tax incentive to use debt. Thus, the Miller model implies all-debt financing over Graham's sample period.
- b. **Unlimited tax deductibility: in reality, firms can deduct interest only to the extent of profits.** Thus, the expected tax benefits of debt financing under this real-world assumption are clearly less than under the assumption of unlimited deductibility. Two effects are likely to result. First, corporations should supply less debt, reducing the interest rate. Second, the first unit of debt



should increase firm value more than the last unit, because the interest on later units may not be deductible.

9. How firms establish Capital STRUCTURE:

- I. **Most corporations have low debt-asset ratios.** Most U.S. corporations use less debt than equity financing.
- II. **A number of firms use no debt.** Agrawal and Nagarajan (1990) examined approximately 100 firms on NYSE without long-term debt. Typically, **the managers of these firms have high equity ownership.** There is significantly greater family involvement in all-equity firms than in levered firms.
- III. **Changes in financial leverage affect firms' value:** Shah (1994) examines the effect of announcements of changes in capital structure on stock prices: **stock prices rise substantially on the date when an exchange offer increasing leverage is announced.** Conversely, stock price falls substantially when an offer decreasing leverage is announced. **Shah's results are consistent with a Signaling version of the trade-off model.** That is, **managers are likely to raise the amount of debt if they believe that the probability of bankruptcy has been decreased and lower debt if they believe that the probability has been increased.** Shah's results are also consistent with the Pecking-order theory. Here, managers are more likely to turn debt into equity through an exchange offer when they believe the equity is overvalued. The market understands this motive, leading to a stock-price decline.
- IV. **Debt ratios tend to be very low in high growth industries with ample future investment opportunities** such as the drugs and electronics industries.
- V. Three important factors affecting the target debt-equity ratio:
  - a. **Taxes:** if corporate tax rates are higher than bondholder tax rates, there is value from using debt.
  - b. **Types of assets:** if a firm has a large investment in land, buildings, and other tangible assets, it will have smaller costs of financial distress than a firm with a large investment in R&D. R&D typically has less resale value than land; thus, most of its value disappears in financial distress.
  - c. **Uncertainty of operating income:** firms with uncertain operating income have a high probability of experiencing financing distress, even without debt. Thus, these firms must finance mostly with equity. E.g. pharmaceutical firms.

10. **The Miller model (1977)** and the graduated income tax:

- I. In aggregate, the corporate sector will issue just enough debt so that individuals with tax brackets equal to and below the corporate tax rate,

- Transport costs, will hold debt, and individuals with higher tax brackets will not hold debt. They will hold stock.
- II. **Capital-structure decision is a matter of indifference to an individual firm because of competition.**
  - III. The return on bonds will be higher than the return on stocks of comparable risk.

## Chapter 17 Valuation and Capital Budgeting for the Levered Firm

### 1. Adjusted-Present-Value Approach (APV)

- I. **APV = NPV + NPVF**, the value of a project to a levered firm is equal to the value of the project to an unlevered firm (NPV) plus the NPV of the financing side effects:

$$\sum_{t=1}^{\infty} \frac{UCF_t}{(1+r_0)^t} + \text{additional effects of debt} - \text{Initial investment}$$

- II. **Four side effects:** the tax subsidy to debt; the costs of issuing new securities; the costs of financial distress; subsidies to debt financing.
- III. In real world, firms usually have fixed debt-to-market-value ratio. Commercial banks typically lend to real estate developers a fixed percentage of the market value of a project, not a fixed percentage of the initial investment.

### 2. Flow-to-Equity Approach (FTE)

- I. **FTE = cash flow from project to equity holders of the levered firm/**  $r_s$
- II.  $\sum_{t=1}^{\infty} \frac{LCF_t}{(1+r_s)^t} - (\text{Initial investment} - \text{amount borrowed})$

### 3. WACC method

$$\text{NPV of the project} = \sum_{t=1}^{\infty} \frac{UCF_t}{(1+r_{WACC})^t} - \text{Initial investment.}$$

Discount the unlevered cash flow of the project at the WACC.

### 4. A Comparison of the APV, FET, and WACC approaches:

- I. **APV versus WACC: both approaches put the UCF in the numerator.** They adjust the basic NPV formula for unlevered firms in order to reflect the tax benefit of leverage. The APV approach makes this adjustment directly. It simply adds in the present value of the tax shield as a separate term. The WACC approach makes the adjustment in a more subtle way. Here the discount rate  $r_{WACC}$  is lowered below  $r_0$ .

- II. Entity being valued. For the FTE approach, only the firm's contribution to the initial investment is subtracted out. LCFs are net of interest payments.
  - III. **Use WACC or FTE if the firm's target debt-to-value ratio applies to the project over its life. Use APV if the project's level of debt is known over the life of the project.** WACC is the most widely used method in the real world, by far.
5. Beta and Leverage:
- I. The no-Tax case:  

$$\beta_{Equity} = \beta_{Asset} \left(1 + \frac{Debt}{Equity}\right)$$
  - II. The corporate-tax case:  

$$\beta_{Equity} = \beta_{Unlevered \text{ firm}} \left(1 + \frac{(1 - T_c)Debt}{Equity}\right)$$
  - III. **If the firm is levered, use levered equity beta in SML to get  $r_s$ , and we can get levered equity beta from the above formula.**

## Chapter 18 Dividend policy: Why Does it Matter?

1. Different types of dividends:
  - I. **Dividend** usually refers to a cash distribution of earnings. If a distribution is made from sources other than current or accumulated retained earnings, the term **distribution** rather than dividend is used.
  - II. The common type of dividend is in the **form of cash**: public companies usually pay regular cash dividends four times a year.
  - III. **Stock dividend**: is commonly expressed as a ratio; e.g. with a 2% stock dividend a shareholder receives one new share for every 50 currently owned.
2. Standard method of cash dividend payment:
  - I. **Date of record**: the corporation prepares a list on the date of all individuals believed to be stockholders as of this date.
  - II. **Ex-dividend date**: **the second day before the date of record. Before this date the stock is said to trade cum dividend. The stock price should fall on the ex-dividend date.**
3. **MM indifference proposition**:
 

Assumptions:

  - I. **Perfect markets exist**: there are **neither taxes nor brokerage fees**, and no single participant can affect the market price of the security through this/her trades.
  - II. **Homogeneous expectations**: all individuals have the same beliefs concerning future investments, profits, and dividends.

- III. **The investment policy of the firm is set ahead of time**, and is not altered by changes in dividend policy. (Firms should never give up a positive NPV project to increase a dividend (or to pay a dividend for the first time)).

MM proves that investors are indifferent to dividend policy in the general algebraic case.

An increase (a reduction) in dividends through issuance of new shares (share repurchase) neither helps nor hurts the stockholders.

#### 4. Taxes, issuance costs, and dividends

- I. Cash dividends received are taxed as ordinary income. Capital gains are generally taxed at somewhat lower rates. In addition, dividends are taxable when distributed, whereas taxes on capital gains are deferred until the stock is sold. Thus, **for individual shareholders, the effective tax rate on dividend income is higher than the tax rate on capital gains.**
- II. For firms without sufficient cash to pay a dividend: Financial economists generally agree that, in a world of personal taxes, **one should not issue stock to pay a dividend.**
- III. **For firms with sufficient cash (after selecting all positive NPV projects)** to pay a dividend:
  - a. Select additional capital-budgeting projects: it is argued that managers who adopt negative NPV projects are ripe for takeover, leveraged buyouts, and proxy fights.
  - b. Acquire other companies: many researchers have argued that **mergers are not generally profitable to the acquiring company, even when firms are merged for a valid business purpose.**
  - c. Purchase financial assets: it depends on personal and corporate tax rates (for corporate tax rate, have to consider dividend-exclusion percentage: 70%).
- IV. Managers have an incentive to seek alternative uses for funds to reduce dividends.
- V. Though personal taxes mitigate against the payment of dividends, these taxes are not sufficient to lead firms to eliminate all dividends.

#### 5. Repurchase of stock:

- I. **Recently share repurchase has become an important way of distributing earnings to shareholders.** It is a potentially useful adjunct to dividend policy, when tax avoidance is important.
- II. In a perfect market, the firm is indifferent b/w a dividend payment and a share repurchase. But stockholders generally prefer a repurchase to a dividend under current tax law.
- III. The IRS is likely to penalize corporations repurchasing their own stocks if the only reason is to avoid the taxes that would be levied on dividends.

- IV. **Many companies buy back stock because they believe that a repurchase is their best investment.** This occurs more frequently when managers believe that the stock price is temporarily depressed.
- V. Empirically, **the immediate stock market reaction to the announcement of a stock repurchase is usually quite favorable.** Ikenberry, Lakonishok, and Vermaelen (1995) show that the long-term stock price performance of securities after a buyback is significantly better than the stock price performance of comparable companies that do not repurchase.

#### 6. Expected return, Dividends, and personal taxes

- I. **The expected pretax return on a security with a high dividend yield is greater than the expected pretax return on an otherwise identical security with a low dividend yield.** One implication is that an individual in a zero tax bracket should invest in securities with high dividend yields.
- II. **Theory indicates that the expected return on a security should be related to its dividend yield.** Empirically:
  - a. Brennan (1970), Litzenberger and Ramaswamy (1979) find a positive association b/w expected **pretax** returns and dividend yields.
  - b. Black and Scholes (1974) and Miller and Scholes (1982) find no relationship b/w expected pretax returns and dividend yields.
  - c. Fama and French (1992): a relationship b/w returns and the dividend yield is observed only b/c dividend yield is correlated with B/M ratio

#### 7. Real-world factors favoring a high-dividend policy

- I. **Desire for current income**
- II. **Uncertainty resolution:** Gordon: a high-dividend policy also benefits stockholders b/c it resolves uncertainty.
- III. **Tax arbitrage:** see Miller and Scholes (1978)
- IV. Agency costs:
  - a. Costs between stockholders and bondholders: bondholders frequently create loan agreements restricting dividend payments.
  - b. Costs between stockholders and managers: Managers find it easier to pursue these selfish goals when the firm has plenty of free cash flow. Several scholars have suggested that dividends can serve as a way to reduce agency costs.

#### 8. A resolution of real-world factors?

Information content of dividends:

Two different positions on dividends:

- 1). Because of tax effects, a firm's stock price may be negatively related to the current dividend when future earnings are held constant.
- 2). Because of the desire for current income and related factors, a firm's stock price may be positively related to its current dividend, even when future earnings are held constant.
  - I. It has been **empirically established that the price of a firm's stock will generally rise when its current dividend is increased and fall when its current dividend has been reduced or omitted.** The reality seems to support

- 2). **However, several authors have countered that the observation itself is consistent with two: companies don't like to cut a dividend. Thus, firms will raise the dividend only when future earnings, cash flow, and so on are expected to rise enough so that the dividend is not likely to be reduced later to its original level. A dividend increase is management's signal to the market that the firm is expected to do well.**
- II. The rise in the stock price following the dividend signal is called the **information-content effect of the dividend**.
  - III. Several models of dividend policy incorporate managerial incentive to communicate information via dividends.

### **The Clientele effect:**

Different investors in different tax-bracket, favor different firms with different dividend policies. At last, the demand and supply of high-dividend stocks is at equilibrium.

A firm can boost its stock price only if an unsatisfied clientele exists.

**It is showed that stocks with the highest dividend yields tend to be held by individual investors in low tax brackets.**

- 9. What we know and do not know about dividend policy
  - I. **Corporate dividends are substantial:** payout ratio is, on average, 43% for the period from 1963 to 1998.
  - II. **Fewer companies pay dividends:** FF (2001) point out that the percentage of companies paying dividends has fallen in recent years.
  - III. **Corporations smooth dividends: Lintner (1954):**
    - a. Real-world companies typically set **long-run target ratios of dividends to earnings**.
    - b. Managers know that only part of any change in earnings is likely to be permanent. Because managers need time to assess the permanence of any earnings rise, **dividend changes appear to lag earnings changes by a number of periods.**

### **10. Stock Dividends and Stock Splits**

- I. In a perfect market, both have no value to the firm.
- II. **Popular trading range: a security has a proper trading range.** When the security is priced above this level, many investors do not have the funds to buy the common trading unit of 100 shares, called a **round lot**. Although securities can be purchased in **odd-lot** form (fewer than 100 shares), the commissions are more expensive here. Thus firms will split the stock to keep its price in this trading range.
- III. Copeland argues that **two types of transaction costs** rise following a stock split: **brokerage fees**, measured in percentages, increase after a split; **the bid-ask spread**, expressed as a percentage of sales price, rises after a stock split.
- IV. **Reverse split:** one-for-three reverse split. **Three reasons:** a. **transaction costs** to shareholders are often less after the reverse split; b. **the liquidity and marketability** of a company's stock are improved when its price is raised to the "popular trading range". C. **stocks selling below a certain level are not**

considered “respectable”, implying that investors bias downward their estimates of these firms’ earnings, growth, and stability.

## Chapter 19 Issuing Securities to the Public

### 1. The Public Issue:

The basic procedure for a new issue

I. Obtain approval from the board of directors.

II. The firm must prepare and file a registration statement with the SEC.

**Registration statement:** A carefully prepared set of documents, including a **prospectus**, which is filed with the **SEC** prior to an **initial public offering**.

III. The SEC studies the registration statement during a **waiting period**. During this time, the firm may distribute copies of a preliminary prospectus.

A registration statement will become effective on the 20<sup>th</sup> day after its filing unless the SEC sends a letter of comment suggesting changes. After the changes are made, the 20-day waiting period anew.

### preliminary prospectus

The initial document published by an **underwriter** of a **new issue** of **stock** to be given to prospective investors. It is understood that the document will be modified significantly before the **final prospectus** is published. **also called red herring**.

### prospectus

A legal document **offering securities** or **mutual fund shares** for sale, required by the **Securities Act of 1933**. It must explain the **offer**, including the **terms**, **issuer**, **objectives** (if **mutual fund**) or planned use of the money (if securities), **historical financial statements**, and other information that could help an individual decide whether the **investment** is appropriate for him/her. **also called offering circular** or **circular**.

### waiting period

The period after a company's **prospectus** has been filed with the **SEC** and before the **IPO**, during which the company's relations with investors are greatly restricted. Usually lasts 20 days. **also called cooling-off period**.

IV. The registration statement does not initially contain the price of the new issue. On the effective date of the registration statement, a price is determined and a full-fledged selling effort gets under way. A final prospectus must accompany the delivery of securities or confirmation of sale, whichever comes first.

V. **Pricing the issue:** usually not before the last day of the registration period. **For seasoned offerings the price is set close to the prevailing market price.** For IPOs intensive research and analysis are required.

VI. **Tombstone advertisements** are used during and after the waiting period.

**tombstone**

An **advertisement** in a business newspaper or magazine, placed by an **investment bank**, announcing an **offering** and listing the **syndicate** members.

- VII. **Public offering and sale:** shortly after the last day of the registration period. In a typical **firm commitment contract**, the underwriter buys a stipulated amount of stock from the firm and sells it at a higher price. The selling group assists in the sale.
- VIII. **Market stabilization:** usually 30 days after the offering. The underwriter stands ready to place orders to buy at a specified price on the market.

2. Alternative Issue Methods:

Two kinds of public issues: the **general cash offer** and the **rights offer**. **Cash offers are sold to all interested investors**, and **right offers are sold to existing shareholders**. Equity is sold by both the cash offer and the rights offer, though **almost all debt is sold by cash offer**. **All IPOs are cash offers**.

3. Cash Offer:

I. **Firm commitment offering**

An arrangement in which an underwriter assumes the risk of bringing a new securities issue to market, by buying the issue from the issuer and guaranteeing sale of a certain number of shares to investors. **More common than best efforts offering**

In a firm commitment, underwriters act as a dealer and are responsible for any unsold inventory. The dealer profits from the spread between the purchase price and the public offering price. Also known as a "firm commitment underwriting."

II. **Best efforts offering**

An underwriting in which an investment bank, acting as an agent, agrees to do its best to sell the offering to the public, but does not buy the securities outright and does not guarantee that the issuing company will receive any set amount of money. Less common than a firm commitment offering.

Ritter (1987) found that **best-efforts offerings are generally used for small IPOs and firm-commitment offerings are generally used for large IPOs**.

III. **Green shoe**

A **provision** in an underwriting agreement which allows members of the underwriting syndicate to purchase additional shares at the original price. This is a useful provision for underwriters in the event of exceptional public demand. The name comes from the fact that Green Shoe Company was the first to grant such an option to underwriters. also called overallotment provision.

**The Green shoe option is a benefit to the underwriting syndicate and a cost to the issuer.** If the market price of the new issue goes above the offering price within 30 days, the underwriters can buy shares from the issuer and immediately resell the shares to the public.

IV. **Two basic methods for selecting the syndicate**

a. **negotiated underwriting**

Underwriting in which the purchase price and the public offering price are determined through negotiations **between the issuer and a**



**single syndicate**, as opposed to through multiple competitive bidding. **Most underwriting is negotiated.**

b. **Competitive Bid**

A process whereby an underwriter submits a sealed bid to the issuer. The issuer awards the contract to the underwriter with the best price and contract terms.

**Negotiated deals in investment banking occur with all but the largest issuing firms.** Except in the case of large issues, these underwriters could not expend the time and effort without the near certainty of receiving the contract.

Studies show that **issuing costs are higher in negotiated deals than in competitive ones.** However, **many financial economists argue that issuing firms are not necessarily hurt by negotiated deals.** They point out that the underwriter gains much info about the issuing firm through negotiation, info likely to increase the probability of a successful offering. (Hansen and Khanna (1994)).

V. **Robert Hansen on the economic rationale for the Firm commitment offer:**

**Underwriters provide four main functions: certification, monitoring, marketing, and risk bearing.**

- a. **Certification assures investors that the offer price is fair.**  
Certification increases issuer value by reducing investor doubt about fairness, making a better offer price possible.
- b. **Monitoring** of issuing firm management and performance builds value because it adds to shareholders' ordinary monitoring.  
**Underwriters provide collective monitoring on behalf of both capital suppliers and current shareholders.** Individual shareholder monitoring is limited b/c of free-riding problem.  
Due diligence and legal liability for the proceeds give investors assurance. However, what makes certification and monitoring credible is lead bank reputation in competitive capital markets, where they are disciplined over time. Evidence that irreputable behavior is damaging to a bank's future abounds.
- c. **Marketing is finding long-term investors who can be persuaded to buy the securities at the offer price.** Issuers and syndicates repeatedly invest in costly marketing practices, such as expensive road shows to identify and expand investor interest.
- d. **Underwriting risk** is like the risk of selling a put option. The risk is likely to be small, because offerings are typically well prepared for quick sell.

VI. **The offering price**

Ritter (1987) finds that the **average firm-commitment IPO rose in price 14.8% in the first day of trading following issuance. The comparable figure is 47.8% for best-efforts IPOs.**

A possible explanation for underpricing: to counteract the winner's curse and attract the average investor, underwriters underprice issues.

4. The Announcement of new equity and the value of the firm.

Asquith and Mullins (1986 JFE), and Masulis and Korwar (1986 JFE) all find that the **market value of existing equity drops on the announcement of a new issue of common stock**. Plausible reasons are:

- I. **Managerial info:** if managers have superior info about the market value of the firm, they may know when the firm is overvalued. The potential new shareholders will infer overvaluation from the new issue, thereby bidding down the stock price on the announcement date of the issue.
- II. **Debt capacity:** when the managers of a firm have special info that the probability of financial distress has risen, the firm is more likely to raise capital through stock than through debt. If the market infers this chain of events, the stock price should fall on the announcement date of an equity issue.
- III. **Falling earnings:** when managers raise capital in amounts that are unexpectedly large and if investors have a reasonable fix on the firm's upcoming investments and dividend payouts, the unanticipated financings are roughly equal to unanticipated shortfalls in earnings.

#### 5. The cost of new issues:

- I. **Spread or underwriting discount.**
- II. **Other direct expenses:** filing fees, legal fees, and taxes- all reported in the prospectus.
- III. **Indirect expenses:** these costs are not reported in the prospectus and include **management time on the new issue**.
- IV. **Abnormal returns:** in a seasoned issue of stock, the price drops by 3 to 4% upon the announcement of the issue. The drop protects new shareholders against the firm's selling overpriced stock to new shareholders.
- V. **Underpricing:** For IPOs, the stock typically rises substantially after the issue date. This is a cost to the firm because the stock is sold for less than its efficient price in the aftermarket.
- VI. **Green Shoe option.**

Lee, Lockhead, Ritter, and Zhao (1996, JF Reseach): report underwriting discount and other direct expense. Their findings for both equity offerings and debt offerings showed that:

- a. **the costs decline as the gross proceeds of the offering increase.** Thus, it appears that **issuance costs are subject to substantial economies of scale**.
- b. **Direct expenses are higher for equity offers than for debt offers.**
- c. The costs of issuing securities are quite large. Total direct expenses are approximately 17% for an IPO of less than \$10M. And underpricing costs are another 16%.

#### 6. Rights:

- I. **Rights offering:** Offering of common stock to investors who currently hold shares which entitle them to buy subsequent issues at a discount

from the offering price (within a fixed period). Rights are often transferable, allowing the holder to sell them on the open market.

- a. **one right for each share.**
  - b. Number of rights needed to buy a share of stock = “old” shares/”new” shares.
  - c. **ex-rights date:** The date on which the buyer of common stock is no longer entitled to rights that had been declared
- II. **Standby underwriting:** An agreement whereby an investment bank (the underwriter) will purchase the portion of a new securities issue that remains after a public offering. This eliminates the issuer's risk, but it increases the investment banker's risk
- III. **Stockholders can neither lose nor gain from exercising or selling rights.**
- IV. Smith (1977) calculated the issuance costs from **three alternative methods: an equity issue with underwriting, a rights issue with standby underwriting, and a pure rights issue.** The results suggest that **a pure rights issue is the cheapest of the three alternatives. Surprisingly, Smith points out that over 90% of new issues are underwritten.**

#### 7. Shelf Registration:

- I. A term used for the SEC rule 415, which **allows a corporation the ability to comply with registration requirements up to 2 years before doing a public offering.** The corporation must still file the required annual and quarterly reports to the SEC. **With a registration on the shelf, the corporation can go to market quickly when conditions become favorable. Rule 415:** An SEC rule allowing for shelf registrations of securities which will be issued in the future, when market conditions are more favorable.
- II. Dennis (1991, JB) shows that **shelf registration is almost never used for equity but is used about one-half of the time for debt.**
- III. The rule has been very controversial: against:
  - a. the timeliness of disclosure is reduced with shelf registration, b/c the master registration statement may have been prepared up to two years before the actual issue occurs.
  - b. Some argue that **shelf registration will cause a market overhang**, b/c registration informs the market of future issues. It has been suggested that this overhang will depress market prices. However, Bhagat, Marr, and Thompson (1985) found that it is less costly than conventional underwriting and found no evidence to suggest a market-overhang effect. Surprisingly, few eligible companies are currently selling equity by using shelf registration.

**Overhang:** A block of securities or commodities contracts which is large enough to put downward pressure on prices if sold all at once.

## 8. The private equity market.

- I. **In 1990, Rule 144A** was adopted by the SEC and established a framework for the issuance of private securities to certain qualified institutional investors. **Rule 144A: An SEC rule that modified a two-year holding period requirement on privately placed securities by permitting Qualified Institutional Buyers (QIBs) to trade these positions among themselves.** This has substantially increased the liquidity of the affected securities. To qualify to buy Rule 144A offerings, investors, must have at least \$100M in assets under management.
- II. The private equity market can be divided into **venture equity** and **nonventure equity markets**. **A large part of the nonventure market is made up of firms in financial distress.** Firms in financial distress are not likely to be able to issue public equity and typically cannot use traditional forms of debt such as bank loans or public debt. For them, the best alternative is to find a private equity market firm.
- III. **Private equity:** When equity capital is made available to companies or investors, but not quoted on a stock market. The funds raised through private equity can be used to develop new products and technologies, to expand working capital, to make acquisitions, or to strengthen a company's balance sheet.
  - a. **The average individual investor will not have access to private equity** because it requires a very large investment.
  - b. **Private equity firm:** the **limited partnership** is the dominant form of intermediation in this market. Typically, **the institutional investors act as the limited partners and the professional managers act as general partners.** The general partners are firms that specialize in funding and managing equity investments in closely held private firms.
- IV. **Stages of financing of venture capital\**
  - a. **Seed-Money stage:** a small amount of financing needed to prove a concept or develop a product. **Marketing is not included in this stage.**
  - b. **Start-up:** financing for firms that started within the past year. Funds are likely to pay for marketing and product development expenditures.
  - c. **First-round financing:** additional money to begin sales and manufacturing after a firm has spent its start-up funds.
  - d. **Second-round financing:** funds earmarked for working capital for a firm that is currently selling its product but still losing money.
  - e. **Third-round financing:** financing for a company that is **at least breaking even and is contemplating an expansion.** Also **Mezzanine financing.**
  - f. **Fourth-round financing:** money provided for firms that are **likely to go public within half a year.** Also **bridge financing.**

## Chapter 20 Long-Term Debt

1. **Long-term debt (funded debt)** has two major forms: **public issue** and **privately placed debt**.
2. **The public issue of bonds:**
  - I. the general procedures followed for a public issue of bonds are **the same as those for stocks**.
  - II. However, **an indenture is included**. **Indenture**: A contract between an issuer of bonds and a trust company. The trust company is appointed by the corporation to represent the bondholders. The trust company must (1) be sure the terms of the indenture are obeyed, (2) manage the sinking fund, and (3) represent bondholders if the company defaults on its payments. Another name for the bond contract terms, this is also referred to as a deed of trust.
  - III. **A typical bond indenture includes:**
    - a. the basic terms of the bonds.
    - b. A description of property used as security.
    - c. Details of the protective covenants.
    - d. The sinking-fund arrangements.
    - e. The call provision.
  - IV. **Basic terms:**
    - a. **Face value**: also called principal value or denomination.
    - b. Bearer form: A security not registered in the books of issuing corporation but that is payable to its bearer (the person possessing it). **Securities can be issued in two forms: registered or bearer**. **Registered form** means the issuing firm keeps records of a security's owner and mails out payments to him/her. **Bearer form** means the security is traded without any record of ownership, so physical possession of the security is the sole evidence of ownership. Most securities issued today are in registered form. A bearer bond, also known as a coupon bond, has coupons that must be clipped from the security and presented in order to receive interest payments. The issuer will not remind the bearer of coupon payments.
  - V. **Security:**
    - a. **Mortgage**: A loan, secured by the collateral of some specified real estate property, in which the borrower is obligated to make a predetermined set of payments to repay the loan.
    - b. **Mortgage-backed security**: MBS. Security backed by a pool of mortgages, such as those issued by Ginnie Mae and Freddie Mac. also called mortgage-backed certificate.
    - c. **A debenture is an unsecured bond**. Currently, almost all public bonds issued by industrial and finance companies are debentures. However, most utility and railroad bonds are secured by a pledge of assets.
  - VI. **Protective Covenants:**

In a direct placement of debt the repayment schedule is specified in the loan contract. **For public issues, the repayment takes place through the use of a sinking fund and a call provision.**

- a. a **sinking fund** is an account managed by the bond trustee for the purpose of repaying the bonds. A means of repaying funds advanced through a bond issue. The issuer makes periodic payments to a trustee, who retires part of the issue by purchasing the bonds in the open market. This means that every period (usually every year) a company will pay back a portion of their bonds.
- b. **Balloon maturity**: 1. A repayment schedule for a bond issue where a large number of the bonds come due at a one time (normally at the final maturity date). 2. A final loan payment that is considerably higher than prior payments. This is also known as a "balloon payment." When a balloon maturity occurs, a company must pay the principle back to borrowers on many bonds at once. If the company is short on cash then it may have trouble making all the payments.

#### VII. **Call Provision**:

- a. A call provision is a clause in a bond's indenture granting the issuer the right to buy back all or part of an issue prior to the maturity date.
- b. **Call premium**: The dollar amount over the par value of a convertible fixed income and debt security. This amount is given to holders when the security is called by the issuer due to the soft call provision. The call premium is a penalty paid by the issuer to the security holders

#### 3. **Bond refunding**:

- I. Replacing all or part of an issue of outstanding bonds is called bond refunding.
- II. **Should firms issue callable bonds?**
  - a. **Call provisions have value.** First, many publicly issued bonds have call provisions; second, a call works to the advantage of the issuer.
  - b. But, bondholders will take the call provision into account when they buy the bond. We can **expect that bondholders will demand higher interest rates on callable bonds** than on noncallable bonds. In fact, financial economists view call provisions as being zero-sum in efficient capital market.
- III. Since it is a zero-sum, **why are callable bonds issued?**
  - a. **Superior interest rate predictions**:  
Company insiders may know more about interest rate changes on its bonds than does the investing public.  
e.g. the firm may know its credit rating can go up, then its bond rate will go down.
  - b. **Taxes**: call provisions may have tax advantages if the bondholder is taxed at a lower rate than the company. Since callable bonds have higher coupon rates than noncallable bonds and because the coupons provide a deductible

interest expense to the firm and are taxable income to the bondholder, the firm will gain more than a bondholder in a low tax bracket will be. Presumably, some of the tax saving can be passed on to the bondholders in the form of a high coupon (like in a lease).

- c. **Future investment opportunities:** call option gives the firm an option to get out of restrictive covenant in face of good investment opportunity.
- d. **Less interest-rate risk:** the call provision will reduce the sensitivity of a bond's value to changes in the level of interest rates. As interest rates increase, the value of a callable bond will fall. Because the callable bond has a higher coupon rate, the value of a callable bond will fall less than the value of a noncallable bond.
- e. The firm shall call its bond when its price above (not equal) the call price because of the costs associated with issuing new bonds.

#### 4. Bond ratings:

- I. Firms frequently pay to have their debt rated.
- II. Investment grade: a bond with a rating of BBB (for Standard & Poor's or Baa for Moody's) or higher.
- III. **Junk bonds:** also called high-yield or low-grade. **The junk-bond market took on increased importance when these bonds were used to finance mergers and other corporate restructurings.** Whereas a firm can only issue a small amount of high-grade debt, **the same firm can issue much more debt if low-grade financing is allowed as well.** Therefore, the use of junk bonds lets acquirers effect takeovers that they could not do with only traditional bond-financing techniques.
- IV. It is not clear that the great growth in junk-bond financing has altered the returns on these instruments. **On the one hand, financial theory indicates that the expected returns on an asset should be negatively related to its marketability.** Because trading volume in junk bonds has greatly increased in recent years, the marketability has risen as well. This should lower the expected return on junk bonds, thereby benefiting corporate issuers. **On the other hand, the increased interest in junk-bond financing by corporations is likely to raise the expected returns on these assets.** The net effect of these two forces is unclear.
- V. Because the use of junk bonds increases the firm's interest deduction, Congress and the IRS have registered strong disapproval.

#### 5. Different types of bonds:

- I. **straight bond:** Bond which will pay back the principal on its maturity date, will pay a specified amount of interest on specific dates, and **does not carry a conversion privilege or other special features.**
- II. **Convertible bond:** A corporate bond, usually a junior debenture, that can be exchanged, at the option of the holder, for a specific number of shares of the company's preferred stock or common stock. Convertibility affects the performance of the bond in certain ways. First and foremost, **convertible bonds tend to have lower interest rates than non-convertibles** because they

also accrue value as the price of the underlying stock rises. In this way, convertible bonds offer some of the benefits of both stocks and bonds. Convertibles earn interest even when the stock is trading down or sideways, but when the stock prices rise, the value of the convertible increases. Therefore, convertibles can offer protection against a decline in stock price. Because they are sold at a premium over the price of the stock, convertibles should be expected to earn that premium back in the first three or four years after purchase. In some cases, convertibles may be callable, at which point the yield will cease.

- III. Floating-rate bond:** Bond whose interest is pegged to a benchmark, such as the Treasury Bill rate, and adjusted periodically. **The majority of floaters have put provisions and floor-and-ceiling provisions:**
- a. **Put provision:** A relatively uncommon feature of a bond that allows the holder to redeem the bond at par value on specific dates prior to maturity. An investor might exercise a put provision if interest rates have increased since the bond was issued.
  - b. **With floor-and-ceiling provisions** the coupon rate is subject to a minimum and maximum.
  - c. **The popularity of floating-rate bonds is connected to inflation risk.** The bond value is hardly affected by inflation. Since floaters always sell at or near par, they do not generally have call features.

**IV.** Deep-discount/zero-coupon bonds (zeros).

**V.** Income bond:

**Income bond:** A bond that promises to pay interest only when the issuer's income is sufficient; failure to pay interest does not result in default.

**Why don't firms issue more income bonds?**

- a. the **"smell of death"** explanation: firms that issue income bonds signal the capital markets of their increased prospect of financial distress.
- b. The **"dead-weight costs"** explanation: stockholders and bondholders will **not necessarily agree on how to calculate the income**. This **creates agency costs** associated with the firm's accounting methods.

6. Direct placement compared to public issues:

I. More than half of all debt is privately placed. There are **two basic forms of direct private long-term financing: term loans and private placement**.

**II. Term loan:** A loan which is repaid through regular periodic payments, usually over a period of one to 15 years.

**III. A private placement:** also involves the sale of a bond or loan directly to a limited member of investors, is very similar to a term loan except that the maturity is longer.

**IV. Differences b/w direct long-term financing and public issues:**

- a. a direct long-term loan avoids the cost of registration with the SEC;



- b. direct placement is likely to have more restrictive covenants.
- c. It is easier to renegotiate a term loan and a private placement in the event of a default. It is harder to renegotiate a public issue because hundreds of holders are usually involved.
- d. Life insurance companies and pension funds dominate the private-placement segment of the bond market. Commercial banks are significant participants in the term-loan market.
- e. The costs of distributing bonds are lower in the private market.
- f. **The interest rates on term loans and private placements are usually higher than those on an equivalent public issue.**

## Chapter 21 Leasing

**Long-term leasing** is a method of financing property, plant, and equipment. From the lessee's standpoint, long-term leasing is similar to buying the equipment with a secured loan. **The principal benefit of long-term leasing is tax reduction.** Leasing allows the transfer of tax benefits from those who need equipment but cannot take full advantage of the tax benefits associated with ownership to a party who can. **If the corporate income tax were repealed, long-term leasing would virtually disappear.**

1. Types of leases:
  - I. **Direct leases:** A contractual financing arrangement in which the **lessor**, typically a bank, purchases the property directly from the manufacturer and leases that property to the **lessee**.
  - II. **Sales-type lease:** the lessor is the manufacturer.
  - III. **Operating leases:**
    - a. Operating leases are usually not fully amortized. Thus, the lessor must expect to recover the costs of the asset by renewing the lease or by selling the asset for its residual value.
    - b. It usually requires the lessor to maintain and insure the leased assets.
    - c. It is also the cancellation option. This option gives the lessee the right to cancel the lease contract before the expiration date.
  - IV. **Financial leases:** are the exact opposite of operating leases:
    - a. they don't provide for maintenance or service by the lessor.
    - b. They are fully amortized.
    - c. The lessee usually has a right to renew the lease on expiration.
    - d. Generally, they cannot be canceled.
  - V. **Two types of financial leases:**
    - a. **Sale and lease-back:**  
It occurs when a company sells an asset it owns to another firm and immediately leases it back. Two things happen:

- 1). The lessee receives cash from the sale of the asset.
- 2). The lessee makes periodic lease payments, thereby retaining use the asset.
- b. **Leveraged leases:** is a three-sided arrangement among **the lessee, the lessor, and the lenders:**
  - 1). The lessor purchases the assets, delivers them to the lessee, and collects the lease payments. However, the lessor puts up no more than 40-50% of the purchase price.
  - 2). The lenders supply the remaining financing and receive interest payments from the lessor.
  - 3). **The lenders in a leveraged lease typically use a nonrecourse loan.** This means that the lessor is not obligated to the lender in case of a default. The lender is protected in two ways: a. the lender has a first lien on the asset. B. in the event of loan default, the lease payments are made directly to the lender.
  - 4). The lessor puts up only part of the funds but gets the lease payments and all the tax benefits of ownership. These lease payments are used to pay the debt service of the nonrecourse loan.
  - 5). The lessee benefits because, in a competitive market, the lease payment is lowered when the lessor saves taxes.
2. Accounting and leasing:
  - I. **Under FAS 13, certain leases are classified as capital leases. For a capital lease, the PV of the lease payments appears on the right-hand side of the balance sheet. The identical value appears on the left-hand side of the balance sheet as an asset. FASB classifies all other leases as operating leases, which lead to off-balance-sheet.**
  - II. **capital lease:** A lease that meets one or more of the following criteria, meaning it is classified as a purchase by the lessee: the lease term is greater than 75% of the property's estimated economic life; the lease contains an option to purchase the property for less than fair market value; ownership of the property is transferred to the lessee at the end of the lease term; or the present value of the lease payments exceeds 90% of the fair market value of the property.
  - III. **Operating lease:** A lease for which the lessee acquires the property for only a small portion of its useful life. An operating lease is commonly used to acquire equipment on a short-term basis. Any lease that is not a capital lease is an operating lease.
  - IV. **Off-balance-sheet financing:** Financing from sources other than debt and equity offerings, such as joint ventures, R&D partnerships, and operating leases.
3. Taxes, the IRS, and leases:
  - I. The lessee can **deduct lease payments for income tax purposes if the lease is qualified by IRS. All interested parties generally obtain an opinion form the IRS before agreeing to a major lease transaction.**
  - II. There are several guidelines from IRS:
    - a. the term of the lease must be less than 30 years.

- b. The lease should not have an option to acquire the asset at a price below its fair market value.
- c. The lease should not have a schedule of payments that is very high at the start of the lease term and thereafter very low...
- III. The reason the IRS is concerned about lease contracts is that **many times they appear to be set up solely to avoid taxes**. The speedup of lease payments would greatly benefit the firm and de facto give it a form of accelerated depreciation. If the tax rates of the lessor and the lessee are different, leasing can be a form of tax avoidance.

#### 4. Lease-versus-buy:

- I. **Use NPV of the incremental cash flows** (difference of cash flows between those from leasing the equipment and those from buying it).
- II. In a world with corporate taxes, the firm should **discount riskless cash flows at the after-tax riskless rate of interest**.
- III. In a world with corporate taxes, one determines the increase in the firm's optimal debt level by discounting a future guaranteed after-tax inflow at the after-tax riskless interest rate. (Hold for riskless or guaranteed cash flows).
- IV. **A lease payment is like the debt service on a secured bond issued by the lessee**, and the discount rate should be approximately the same as the interest rate on such debt.
- V. **Real-world companies discount both the depreciation shield and lease payments at the same rate** (theoretically, discount rate of depreciation shield should be higher).
- VI. **Why not use WACC as the discount rate?** Because cash flows are more like debt-service cash flows than operating cash flows and, as such, the risk is much less. The discount rate should reflect the risk of the incremental cash flows ( $= r_B (1 - T_c)$ ), the after-tax interest rate on secured debt issued by the lessee).

#### 5. Debt displacement and lease valuation:

- I. Instead of buying it, the lessee uses leases to displace debt.
- II. **Debt displacement is a hidden cost of leasing**. If a firm leases, it will not use as much regular debt as it would otherwise. The benefits of debt capacity will be lost. (the lessee thinks in terms of an **optimal liability-to-equity ratio** instead of optimal debt-equity-ratio)

#### 6. Zero-sum game?

**As long as (1) both parties (lessor and lessor) are subject to the same interest and tax rates and (2) transaction costs are ignored, there can be no leasing deal that benefits both parties.** However, there is a lease payment for which both parties would calculate an NPV of zero.

#### 7. Reasons for leasing:

##### Good reasons:

- I. **Taxes may be reduced by leasing.**

**Both parties can gain when tax rates to then differ.** The lessor uses the depreciation and interest tax shields that cannot be used by the lessee. The IRS lose tax revenue, and some of the tax gains to the lessor are passed on to the lessee in the form of lower lease payments.

**II. The lease contract may reduce certain types of uncertainty.**

When the lease contract is signed, there may be substantial uncertainty as to what the residual value of the asset will be. It is common sense that the party best able to bear a particular risk should do so. If the user is highly averse to risk, he should find a third-party lessor capable of assuming this burden. This situation frequently arises when the user is a small and/or newly formed firm.

**III. Transactions costs can be higher for buying an asset and financing it with debt or equity than for leasing the asset.**

The costs of changing an asset's ownership are generally greater than the costs of writing a lease agreement.

Unfortunately, **leases generate agency costs as well.** This cost will be implicitly paid by the lessee through a high lease payment.

Thus, leasing is most beneficial when the transaction costs of purchase and resale outweigh the agency costs and monitoring costs a lease.

**Bad reason:** leasing and accounting income: the firm's ROA is generally higher with an operating lease than with either a capitalized lease or a purchase.

(1). Leased assets do not appear on the balance sheet with an operating lease. Thus, the total asset value is less with an operating lease than it is with either a purchase or a capitalized lease.

(2) usually, yearly lease payment is less than the sum of yearly depreciation and yearly interest. Thus, accounting income, the numerator of the ROA is higher with an operating lease.

Ang and Peterson (1984 JF) find that **firms with high debt tend to lease frequently as well.**

Smith and Wakeman (1985, JF) have looked at nontax incentives affecting leasing. Their analysis suggests many asset and firm characteristics that are important in the lease-or-buy decision:

- a. **The more sensitive the value of an asset is to use and maintenance decisions, the more likely it is that asset will be purchased instead of leased.** They argued that ownership provides a better incentive to minimize maintenance costs than does leasing.
- b. **Price-discrimination opportunities may be important.** Leasing may be a way of circumventing laws against charging too low a price.

## V. Attachment:

### Equity Issues and Offering Dilution

Asquith and Mullins

JFE 1986

This is largely an event study paper that looks at 531 offerings (both primary as well as secondary offerings) from 1963-1981. As predicted by many models (agency cost, pecking order, and information asymmetry) the offerings were met with negative reactions. [Note: **primary transactions affect capital structure where secondary offerings would not.**] Overall 2 day reaction was -2.7% (-3% for primary issues, -2% for secondary issues.)

This negative reaction was not as pronounced in utility stocks, which suggests less informational asymmetry due to the regulations that were in place during this time period.

The paper also looks at **dilution (defined as the ratio of the change in equity value to the proceeds of the issue)**. For primary offering the average dilution is -31% (median 28%). For secondary offerings the average dilution was -77.6% (median 43.4%). **(In English the firms loses 31% of the new money they raised which may explain why firms are so hesitant to sell equity.)**

**More than 80% of the issues caused decreases in value of existing stock and more than 6% of the issues caused dilution of over 100%.** That is the firm is worth less AFTER issuing more equity.

Further the larger the issue the larger the price drop.

Both secondary and primary issuers sell after the stock has **done well** *relative to the market*.

Regressions looking at capital structure explanations were insignificant.

## Chapter 22 Options and Corporate Finance: Basic Concepts

### 1. Put-call Parity:

- I. The strategy of buying a put and buying the underlying stock is called a **protective put**.
- II. If investors have the **same payoffs** from the two strategies, the two strategies must have the **same cost**.
  - a. Buying a put and buying the underlying stock have the same payoff as buying a call and buying a zero-coupon bond. Therefore,

- b. **Put-call Parity:** price of underlying stock + price of put (cost of first strategy)= price of call + PV of exercise price (cost of second strategy).
- c. Put-call parity holds **only if the put and the call have both the same exercise price and the same expiration date**. In addition, the maturity date of the zero-coupon bond must be the same as the expiration date of the options.

### III. **Covered-call strategy:**

Price of underlying stock – price of call = - price of put + PV of exercise price.

## 2. **Valuing Option:**

- I. Two sets of factors that determine a call's value: the first set contains the features of the option contract: the expiration price and exercise date. The second set concerns characteristics of the stock and the market.
- II. **Exercise Price:** (-)/put: (+)
- III. **Expiration date:** (+)/put: (+)
- IV. **Stock price:** Other things being equal, the higher the stock price, the more valuable the call option will be. (+)/ put: (-)
- V. **Variability:** (+)/put (+). If investors in the marketplace are risk-averse, a rise in the variability of the stock will decrease its market value. However, the holder of a call receives payoffs from the positive tail of the probability distribution. As a consequence, a rise in the variability in the underlying stock increases the market value of the call.
- VI. **Interest rate:** (+)/put: (-) Buyers of calls do not pay the exercise price until they exercise the option. The ability to delay payment is more valuable when interest rates are high and less valuable when interest rates are low. Thus, the value of a call is positively related to interest rates.

## 3. Two ways to value a call

- I. **Determine the cost of a strategy to duplicate the call.** This strategy involves an investment in a fractional share of stock financed by partial borrowing.
- II. **Calculate the probabilities of a rise and a fall under the assumption of risk-neutrality.**

## 4. **Black-Scholes model:**

- I. The **fundamental insight of Black and Scholes is to shorten the time period**. They show that a specific combination of stock and borrowing can indeed duplicate a call over an infinitesimal time horizon.
- II. Two-state option model:

**Value of call = stock price \* Delta – Amount borrowed**

$$C = S[N(d_1)] - Ee^{-rt}N(d_2)$$

$$d_1 = [\ln(S/E) + (r + 1/2\sigma^2)t] / \sqrt{\sigma^2 t}$$

$$d_2 = d_1 - \sqrt{\sigma^2 t}$$

$$u = e^{\sigma/\sqrt{n}}$$

## 5. **Stocks and Bonds as options:**

**I. Firm expressed in terms of call options:**

- a. Stockholders have a call option on the firm (firm is a stock here, which price = total cash flows) with an exercise price = debt.
- b. Bondholders can be viewed as owning the firm but writing a call option to the stockholders as well.

**Applications: selecting high-risk projects leads to an increase in the volatility of the underlying asset, because the stock is a call option on the firm, a rise in the volatility of the firm increases the value of the stock.**

**II. Firm expressed in terms of put options:**

- a. Stockholders own the firm, owe the debt to the bondholders and buy a put option on the firm with an exercise price = debt.
- b. Bondholders: are owed the debt and have sold a put option.

**III. Loan Guarantees:**

**Value of default-free bond = value of risky bond + value of put option.**

Who benefits from a typical loan guarantee?

- a. If existing risky bonds are guaranteed, all gains accrue to the existing bondholders.
- b. If new debt is being issued and guaranteed, the new debtholders do not gain. The stockholders gain because they are able to issue debt at a low interest rate. Some of the gains accrue to the old bondholders because the firm's value is greater than would otherwise be true.

**6. Investment in real projects and options:**

A firm's ability to delay its investment and operating decisions until the release of info is an option. There is a serious deficiency in classical capital budgeting; **NPV calculations typically ignore the flexibility that real-world firms have.**

## Chapter 23 Options and Corporate Finance: Extensions and Applications

1. Many decisions have few **embedded options** and, in these cases, optionality can be ignored. However, in many cases, options are an important aspect of the decision and must be separately valued. In practice, there is a decision continuum. At one end of the continuum are decisions with little optionality and at the other are decisions with significant optionality.
2. Although Black-Scholes mode is more well known, the binominal model is probably used more frequently in the real world. The flexibility of the binomial model allows it to be applied to a wider range of situation.
3. **Executive Stock Options:**
  - I. **Executive compensation** is usually made up of **base salary plus** some or all of the following elements:
    - a. Long-term compensation.

- b. Annual bonuses.
- c. Retirement contributions
- d. Options.

## II. Why are options increasingly being granted to executives?

- a. **Options make executives share the same interests as the stockholders.** By aligning their interests, it is argued that executives will make better decisions for the benefit of the stockholders.
- b. Using options allows the company to **lower the executive's base pay.**
- c. **Options put an executive's pay at risk**, rather than guaranteeing it independent of the performance of the firm.
- d. **Options are a tax-efficient way** to pay employees.

## III. Valuing Executive compensation:

- a. The **exercise price is generally set equal to the market price of the stock** on the date the executive receives the options.
- b. A call option on a dividend-paying stock is worth less than a call on a stock that pays no dividends.
- c. When options are a large portion of an executive's new worth and **the executive is forced by the company to be undiversified, the total value of the position is worth less to the executive than the fair financial market value.**

## 4. Valuing a start-up

- a. **Two options:** the option to abandon under bad conditions and the option to expand under good conditions.
- b. **The notion of embedded options is at the heart of business.**

## 5. Binomial model: option problems can be handled most easily by assuming risk-neutral pricing.

**Step 1: Determining the risk-neutral probabilities:** determine the probabilities such that the expected return on the project (underlying asset) exactly equals the risk-free rate.

Under risk-neutrality, the expected return on any asset would equal the riskless rate of interest. No one would demand an expected return above this riskless rate, because risk-neutral individuals do not need to be compensated for risk-bearing.

**Step 2: value an option using risk-neutral pricing** (using risk-neutral probabilities on returns on options).

**Three-Date:** assume **the same variability** as we move forward from one date to the next.

Step 1: Determining the risk-neutral probabilities.

Step 2: valuing the option as of the last interval.

Step 3: valuing the option as of the second to last interval...

## Extension to many dates:

$$u = e^{\sigma/\sqrt{n}}, \text{ and } d = 1/u.$$



where  $\sigma$  is the standard deviation of the annualized return on the underlying asset and  $n$  is the number of intervals over a year.

Although the value of the call changes as the number of intervals increases, convergence occurs quite rapidly. Although Black-Scholes may save us time, it does not materially affect our estimate of value.

## Chapter 24 Warrants and Convertibles

A **warrant** gives the holder **the right to buy common stock for cash**. Warrants are **generally issued with privately placed bonds**, though they are also combined with new issues of common stock and preferred stock. In the case of new issues of common stock, warrants are sometimes given to investment bankers as compensation for underwriting services.

A **convertible bond** gives the holder the right to exchange the bond for common stock. There is also convertible preferred stock.

1. Convertible bonds and warrants are **like call options**. There are some important differences:
  - I. **Warrants and convertible securities are issued by corporations**. Call options are traded b/w individual investors.
    - a. **Warrants are usually issued privately and are combined with a bond**. In most cases the **warrants can be detached immediately after the issue**. In some cases warrants are issued with preferred stock, with common stock, or in executive compensation programs.
    - b. Convertibles are usually bonds that can be converted into common stock.
    - c. **Call options are sold separately by individual investors**.
  - II. Warrants and call options are exercised for cash. The holder of a warrant gives the company cash and **receives new shares** of the company's stock. The holder of a call option gives another individual cash in exchange for shares of stock. When someone converts a bond, it is exchanged for common stock. As a consequence, bonds with warrants and convertible bonds have different effects on corporate cash flow and capital structure.
  - III. **Warrants and convertibles cause dilution to the existing shareholders**. The percentage ownership of the existing shareholders will decline. New shares are not issued when call options are exercised. Firms with significant amounts of warrants and convertible issues must report earnings on a primary basis and a fully diluted basis.
  - IV. Firms can hurt warrant holders by paying existing shareholders a large dividend.
2. Warrant pricing:
  - I. **Gain from exercising a single call:**  
Firm's value net of debt/ the number of shares outstanding – Exercise price
  - II. **Gain from exercising a single warrant:**

$(\text{Firm's value net of debt} + \text{Exercise price} * \text{number of warrants}) / (\text{the number of shares outstanding} + \text{number of warrants}) - \text{Exercise price}$

III. Gain from exercising a single warrant =  $\# / (\# + \#w)$  (Gain from exercising a single call)

IV. **The warrant price is the call price multiplied by the ratio  $\# / (\# + \#w)$ .**

### 3. Convertibles:

- I. A convertible gives the holder the right to exchange it for a given number of shares of stock anytime up to and including the maturity date of the bond.
- II. **Conversion ratio:** the number of shares received for each bond.
- III. **market conversion price:** The price that an investor effectively pays for common stock by purchasing a convertible security and then exercising the conversion option. This is equal to the price on the convertible divided by the conversion ratio (the number of shares that the convertible can be converted into).
- IV. **Conversion premium:** The dollar or percentage amount by which the price of the convertible security exceeds the current market value of the common stock into which it could be converted.
- V. Convertibles are almost always protected against stock splits and stock dividends.

### 4. The value of convertibles:

- I. The value of a convertible can be described **in terms of three components: straight bond value, conversion value, and option value:**
- II. **Straight bond value:** is what the convertible bonds would sell for if they could not be converted into common stock.
- III. **Conversion value** is what the bonds would be worth if they were immediately converted into the common stock at current prices. Convertible bonds have **two minimum values: the straight bond value and the conversion value.**
- IV. **Option value:** When the value of the firm is low (high), the value of convertible bonds is most significantly influenced by their underlying value as straight debt (underlying conversion value).
- V. **Value of convertible = the greater of (straight bond value, conversion value) + Option value.**
- VI. Convertible debt pays a lower interest rate than does otherwise identical straight debt.

### 5. Reasons for issuing warrants and convertibles:

A convertible bond is a package of straight debt and an option to buy common stock. In general, if a company prospers, issuing convertible bonds will turn out to be worse than issuing straight bond and better than issuing common stock. In contrast, if a company does poorly, convertible bonds will turn out to be better than issuing straight bonds and worse than issuing common stock.

6. Firms that issue convertible bonds are different from other firms:
  - I. **The bond ratings of firms using convertibles are lower** than those of other firms.
  - II. Convertibles tend to **be used by smaller firms** with high growth rates and more financial leverage.
  - III. **Convertibles are usually subordinated and unsecured.**
7. Why are warrants and convertibles issued?
  - I. **Matching cash flows:**  
If financing is costly, it makes sense to issue securities whose cash flows match those of the firm. A young, risky, and growing firm might prefer to issue convertibles or bonds with warrants b/c these will have lower initial interest costs. When the firm is successful, the convertibles will be converted. This causes expensive dilution, but it occurs when the firm can most afford it.
  - II. **Risk Synergy:** they are useful when it is very costly to assess the risk of the issuing company. The yields on straight bond reflect the risk of default. The yields on convertibles are not so sensitive to default risk. Because, **if the firm turns out to be a high (low) -risk company, the straight component will have low (high) value and the call option will have high (low) value.**
  - III. **Agency costs:** shareholders have incentives to adopt high-risk projects. Creditors have incentives to force the firm into low-risk activities. If these conflicts cannot be resolved, the firm may be forced to pass up profitable investment opportunities. However, **b/c convertible bonds have an equity component**, less expropriation of wealth can occur when convertible debt is issued instead of straight debt. Thus, convertible bonds mitigate agency costs. One implication is that convertible bonds have less-restrictive debt covenants than do straight bonds in the real world.
  - IV. **Backdoor Equity:** Stein (1992, JEF): young, small, high-growth firms cannot usually issue debt on reasonable terms due to high financial distress costs. However, the owners may be unwilling to issue equity if current stock prices are too low.
8. **A puzzle vexes financial researchers: Convertible bonds usually have call provisions.** Companies appear to delay calling convertibles until the conversion value greatly exceeds the call price. From the shareholders' standpoint, the optimal call policy would be to call the convertibles when the conversion value equals the call price.

## Chapter 25

## Derivatives and Hedging Risk

1. A **derivative** is a financial instrument whose payoffs and values are derived from, or depend on, something else. Derivatives are tools for changing the firm's risk exposure. Someone once said that derivatives are to finance what scalpels are to

- surgery. When the firm reduces its risk exposure with the use of derivatives, it is said to be hedging.
2. A **forward contract** is an agreement by two parties to sell an item for cash at a later date. The price is set at the time the agreement is signed. However, cash changes hands on the date of delivery. Forward contracts are **generally not traded on organized exchanges**. Forward contracts have a big flaw. Whichever way the price of the deliverable instrument moves, one party has an incentive to default. Because of this default issue, forward contracts generally involve individuals and institutions who know and can trust each other.
  3. **Futures contracts** are also agreements for future delivery.
    - I. They have certain advantages, such as liquidity, that forward contracts do not. Futures contracts are **generally traded on exchanges**, whereas forward contracts are not traded on an exchange.
    - II. Futures contracts generally allow the seller a period of time (any day during the delivery month) in which to deliver, whereas forward contracts generally call for delivery on a particular day.
    - III. An unusual feature of futures contracts is the **mark-to-the-market convention**. If the price of a futures contract falls on a particular day, every buyer of the contract must pay money to the clearinghouse. Every seller of the contract receives money from the clearinghouse. Everything is reversed if the price rises. The **mark-to-the-market convention prevents defaults** on futures contracts.
    - IV. Futures contracts are traded in three areas: agricultural commodities, metals and petroleum, and financial assets.
  4. The mark-to-the-market convention has two related effects: the first concerns differences in net present value. E.g. a sudden drop in price immediately after purchase, then the buyer has to pay greater net present cash outflow. Second, the firm must have extra liquidity to handle a sudden outflow prior to expiration. This added risk may make the futures contract less attractive.
  5. Two types of hedges: **short hedges and long hedges**. An individual or firm that sells a futures contract to reduce risk is instituting a short hedge. Short hedges are generally appropriate for holders of inventory (plan to sell the inventory at a future time). An individual or firm that buys a futures contract to reduce risk is instituting a long hedge. Long hedges are typically used by firms with contracts to sell finished goods at a fixed price.
  6. An **interest-rate futures contract** employs a bond as the delivery instrument. Treasury bond futures contracts can be priced **using the same type of NPV analysis that is used to price** Treasury bonds themselves. As with other commodities, a short hedge involves the sale of a futures contract. Firms that are committed to buying mortgages or other bonds are likely to institute **short hedges**.

For instance, Mr. Yan made a commitment to loan a total of \$1 million to homeowners on May 1. the loans are 20-year mortgages carrying 12% coupon. Then, Mr. Yan is buying a forward contract on a mortgage. That is, he agree on march 1 to give \$1 million to his borrowers on May 1 in exchange for principal and interest from them every month for the next 20 years. Mr. Yan plans to sell the mortgage to an insurance company on April 15. To hedge interest rate risk between now and April 15, he writes June treasury-bond futures contracts on March 1. As with mortgages, Treasury-bond futures contracts fall in value if interest rate rises. Because he writes the contract, he makes money on these contracts if they fall in value. Therefore, with an interest rate rise, the loss he endures in the mortgages is offset by the gain he earns in the futures market.

**A long hedge** involves the purchase of a futures contract. Firms that have agreed to sell mortgages or other bonds at a fixed price are likely to institute long hedges.

7. Usually, mortgage bankers sell the mortgages to insurance companies. They can get two fees: one is an **origination fee**, which is paid to the mortgage banker from the insurance company on the date the loan is sold. And industry standard is about 1% of the value of the loan. Second, the banker will **act as a collection agent** for the insurance company. For this service, he will receive a small portion of the outstanding balance of the loan each month.
8. Duration measures the average maturity of all the cash flows in a bond. Bonds with high duration have high price variability. Firms frequently try to match the duration of their assets with the duration of their liabilities.  
**Duration of assets \* market value of assets = duration of liabilities \* market value of liabilities.**

## Chapter 30 Mergers and acquisitions

- I. Summary:
  1. Synergies: benefits from acquisitions.
  2. acquisitions are an important control device of shareholders.
  3. mergers and acquisitions sometimes involve unfriendly transactions. The sought-after firm may use defensive tactics, including poison pills, greenmail, and white knights.

The NPV of an acquisition candidate is the difference between the synergy from the merger and the premium to be paid.

Four types of synergy:

- a. revenue enhancement;
- b. cost reduction;
- c. lower taxes;
- d. lower cost of capital.

- II. The basic forms of acquisitions:

1. merger or consolidation:

Merger: the absorption of one firm by another.

Consolidation: the same as a merger except that an entirely new firm is created.

They are the least costly to arrange from a legal standpoint, but they require a vote of approval by the shareholders.

## 2. acquisition of stock

purchase the firm's voting stock in exchange for cash, shares of stock, or other securities. It is usually done by a **tender offer**, which is a public offer to buy shares of a target firm. In an acquisition of stock, no shareholder meetings must be held and no vote is required. The target firm's management and board of directors can be bypassed. Acquisition of stock is often unfriendly. Frequently a minority of shareholders will hold out in a tender offer, and thus the target firm cannot be completely absorbed. Complete absorption of one firm by another requires a merger. Many acquisitions of stock end with a formal merger later.

## 3. acquisition of assets

it is costly because it requires more difficult transfer of asset ownership.

Takeovers can occur by **acquisition, proxy contests, and going-private** transactions.

### III. The tax forms of acquisitions.

**Taxable acquisition:** the shareholders of the acquired firm are considered to have sold their shares, and they have realized capital gains or losses that will be taxed.

**Tax-free acquisition,** the selling shareholders are considered to have exchanged their old shares for new ones of equal value, and they have experienced no capital gains or losses. In a tax-free acquisition, the assets are not revalued.

### IV. Accounting for acquisitions

Firms keep two distinct sets of books: the **stockholders' books and the tax books.**

**The Purchase acquisition method:** the assets of the acquired firm be reported at their fair market value on the books of the acquiring firm. Goodwill is the excess of the purchase price over the sum of the fair market values of the individual assets acquired. Accounting method used in any merger, which is not treated as a pooling of interests. The purchasing company treats the acquired as an investment, adding the acquired's assets to its own balance sheet, and recording any premium paid above market price as goodwill, to be charged against future earnings.

Due to both goodwill and asset write-ups, purchase accounting will usually result in lower reported income on the stockholders' books than will pooling.

## pooling of interests

One method of accounting for a company merger, in which the balance sheets of the two companies are combined line by line without a tax impact. Only allowed under certain circumstances.

### V. Source of synergy from acquisition

Synergy =  $\sum_{t=1}^T \frac{\Delta CF_t}{(1+r)^t}$ ,  $r$  is the risk-adjusted discount rate appropriate for the incremental cash flows. This is generally considered to be the required rate of return on the equity of the target.

$$\Delta CF_t = \Delta Rev_t - \Delta Cost_t - \Delta Taxes_t - \Delta Capital Requirements_t$$

**Revenue enhancement:**

marketing gains: previously ineffective media programming; a weak existing distribution network; an unbalanced product mix.

strategic benefits: beachhead is used to describe the process of entering a new industry to exploit perceived opportunities. The beachhead is used to spawn new opportunities based on intangible relationships.

Market or monopoly power: the evidence doesn't suggest that increased market power is a significant reason for mergers.

**Cost reduction:** economies of scale (e.g. spreading overhead). Economies of vertical integration, complementary resources, elimination of inefficient management.

**Tax gains:**

the use of tax losses from net operating losses(NOL);

unused debt capacity(because some diversification occurs when firms merge, the cost of financial distress is likely to be less for the combined firm. Thus the acquiring firm might be able to increase its debt-equity ratio after a merger, creating additional tax benefits – and additional value.)

**surplus funds:** firms have several ways to spend the free cash flow: pay dividends, buy back its own shares, acquire shares in another firm and make acquisitions.

VI. A cost to stockholders from reduction in risk:

A reduction of the variability of firm values can occur if the values of the two firms are less than perfectly correlated, which can reduce the cost of borrowing and make the creditors better off than before.

Mergers and acquisitions in the aggregate will usually help bondholders. The size of the gain to bondholders depends on the reduction of bankruptcy states after the combination. Stockholders of the acquiring firm will be hurt by the amount that bondholders gain.

The conclusions apply to mergers and acquisitions where no synergy is present.

VII. Defensive tactics:

**Divestitures:** target-firm may decide a narrowing of strategic focus can increase stock price, thereby making a takeover too expensive.

A sale of assets:

A **spin-off:** the parent company distributes shares of a subsidiary to its shareholders.

Typically, the stock in the subsidiary is distributed pro rata to the parent-company shareholders. A variant of the spin-off is called an equity carveout, where the stock of the subsidiary is sold to the public in an IPO.

**carve-out** A situation in which a parent company sells a minority share of a child company, usually in an IPO, while retaining the rest. The child

company will have its own board of directors and financial statements, but will benefit from the parent company's resources and strategic support. Usually, the parent company will eventually sell the rest of the child company in the open market. also called partial spinoff

The issuance of a **tracking stock**: A stock issued by a parent company to create a financial vehicle to track the performance of a particular division or subsidiary. When a parent company issues a tracking stock, all revenues and expenses of the division are separated from the parent company's financial statements and attributed to the tracking stock. Often this is done to separate a high growth division with large losses from the financial statements of the parent company. Furthermore, the parent company and its shareholders still control operations.

Tracking stock differs from a spinoff in that it does not represent or require any change in business structure. Holders of tracking stock are considered to hold equity in the parent company and not the specific entity represented by the tracking stock. Tracking stock is often set up by companies that have several diverse divisions, both so that investors can take a share in a division of their interest, and so that the performance of these divisions can be tracked in terms of shareholder interest. A company will sometimes issue a tracking stock when it has a very successful division that it feels is underappreciated by the market and not fully reflected in the company's stock price.

**The corporate charter**: firms frequently amend corporate charters to make acquisitions more difficult. E.g. requiring 80% approval by the shareholders (supermajority amendment).

### Repurchase standstill agreements

**greenmail** A premium paid to a raider to get him/her to terminate a takeover attempt.

**Leveraged buyouts (LBOs)**: two reasons given for the ability of an LBO to create value: the extra debt provides a tax reduction; LBO usually turns the previous managers into owners, thereby increasing their incentive to work hard.

### VIII. Other devices of Takeovers:

**Golden parachutes**: A clause in an executive's employment contract specifying that he/she will receive large benefits in the event that the company is acquired and the executive's employment is terminated. These benefits can take the form of severance pay, a bonus, stock options, or a combination thereof.

**Crown jewels**: The most valuable unit of a corporation because of profitability, asset value, future prospects, etc. firms often sell crown jewels when faced with a takeover threat.

**Poison Pill** A strategy used by corporations to discourage a hostile takeover by another company. The target company attempts to make its stock less attractive to the acquirer. There are two types of poison pills:



1. A "flip-in" allows existing shareholders (except the acquirer) to buy more shares at a discount.
2. The "flip-over" allows stockholders to buy the acquirer's shares at a discounted price after the merger.
  1. By purchasing more shares cheaply (flip-in), investors get instant profits and, more importantly, they dilute the shares held by the competitors. As a result, the competitor's takeover attempt is made more difficult and expensive.
  2. An example of a flip-over is when shareholders have the right to purchase stock of the acquirer on a 2-for-1 basis in any subsequent merger.

This is similar to the macaroni defense, except it uses equity rather than bonds.

## Chapter 31 Financial Distress

1. Financial distress is a situation where a firm's operating cash flows are not sufficient to satisfy current obligations and the firm is forced to take corrective action.
  2. **Stock-based insolvency** occurs when a firm has negative net worth, and so the value of assets is less than the value of its debts. **Flow-based insolvency** occurs when operating cash flow is insufficient to meet current obligations.
  3. Firms **deal with financial distress** in several ways, such as:
    - 1). Selling major assets;
    - 2). Merging with another firm;
    - 3). Reducing capital spending and R&D;
    - 4). Issuing new securities;
    - 5). Negotiating with banks and other creditors;
    - 6). Exchanging debt for equity;
    - 7). Filing for bankruptcy.

1)-3) concern the firm's assets. Items 4)-7) involve the right-hand side of the firm's balance sheet and are examples of financial restructuring. Financial distress may involve both asset restructuring and financial restructuring.
  4. **bankruptcy**: A proceeding in a federal court in which an insolvent debtor's assets are liquidated and the debtor is relieved of further liability. **Chapter 7** of the Bankruptcy Reform Act **deals with liquidation**, while **Chapter 11 deals with reorganization**.
- Liquidate**: To sell all of a company's assets, pay outstanding debts, and distribute the remainder to shareholders, and then go out of business.
- Reorganization**: A process designed to revive a financially troubled or bankrupt firm. A reorganization involves the restatement of assets and liabilities, and communication with creditors in order to make arrangements for maintaining repayment. Reorganization is an

attempt to extend the life of a company facing bankruptcy through special arrangements and restructuring in order to minimize the possibility of past situations reoccurring.

**Chapter 7:** The part of the U.S. Bankruptcy Code describing the liquidation of a company after bankruptcy.

**Chapter 11:** The part of the U.S. Bankruptcy Code describing how a company or creditor can file for court protection. In the case of a corporation, reorganization occurs under the existing management.

5. **Absolute priority rule** The principle in bankruptcy proceedings that requires senior creditors to be fully paid before junior creditors and stockholders may receive any payment.  
Also known as liquidation preference.
6. One of the objectives of bankruptcy and other distressed workout arrangements is that creditors and other suppliers of capital clearly know their rights and expected recoveries in the event of a distressed situation. When these are not transparent and/or are based on outdated processes with arbitrary and possibly corrupt outcomes, then the entire economic system suffers and growth is inhibited.
7. A number of intriguing theoretical and empirical issues are related to the distressed firm. Among these are corporate debt capacity, manager-creditor-owner incentives, ability to predict distress, data and computations for default rate estimation, investment in securities of distressed firms and post-reorganization performance assessment.
8. Distress prediction models have evolved from univariate financial statement ratios to multivariate statistical classification models, to contingent claim and market value based approaches and finally to using artificial intelligence techniques.
9. the most intriguing by-product of corporate distress is the development of a relatively new class of investors known as **“vultures”**. **Distressed debt investors** have target annual rates return of 20-25%. Although these annual rates are sometimes earned, the overall annual rate of return from 1978-1997 has been about 12% - similar to high yield bonds but much below returns in the stock market.
10. Formal bankruptcy or private workout:
  - 1) Historically, one half of financial restructurings have been private workout, but, recently, formal bankruptcy has dominated.
  - 2) Firms that emerge from private workouts experience stock-price increases that are much greater than those for firms emerging from formal bankruptcies.
  - 3) The direct costs of private workouts are much less than the costs of formal bankruptcies.
  - 4) Top management usually loses pay and sometimes jobs in both private workouts and formal bankruptcies.

11. why do firms ever use formal bankruptcies to restructure?

- 1) The marginal firms: for some firms formal bankruptcy is better. Formal bankruptcy allows firms to issue debt that is senior to all previously incurred debt. This new debt is “debtor in possession” (DIP) debt. For firms that need a temporary injection of cash, DIP debt makes bankruptcy reorganization an attractive alternative to a private workout. There are some tax advantages to bankruptcy. Firms do not lose tax carryforwards in bankruptcy, and the tax treatment of the cancellation of indebtedness is better in bankruptcy. Also, interest on prebankruptcy unsecured debt stops accruing in formal bankruptcy.
- 2) Holdouts: bankruptcy is usually better for the equity investors than it is for the creditors. Using DIP debt and stopping prebankruptcy interest on unsecured debt helps the stockholders and hurts the creditors. Equity investors can usually hold out for a better deal in bankruptcy. The absolute priority rule, is usually violated in formal bankruptcies. 81% of recent bankruptcies the equity investor obtained some compensation.
- 3) Complexity: a firm with a complicated capital structure will have more trouble putting together a private workout.
- 4) Lack of information: the conflict of interest between equity investors and creditors.

Financial distress will be more expensive if complexity is high and information is incomplete. Complexity and lack of information make cheap workouts less likely.

12. Prepackaged bankruptcy: is a combination of private workout and legal bankruptcy. The firm and most of its creditors agree to private reorganization outside formal bankruptcy. After the private reorganization is put together, the firm files a formal bankruptcy under chapter 11. it requires that most creditors reach agreement privately. It doesn't seem to work when there are thousands of reluctant trade creditors. The main benefit of prepackaged bankruptcy is that it forces holdouts to accept a bankruptcy reorganization. It offers many of the advantages of a formal bankruptcy, but they are also more efficient.

13. it is axiomatic that the more complicated a firm's financial structure, the more difficult it will be to work out private arrangements to avoid bankruptcy.