BOOK 4 – CORPORATE FINANCE, PORTFOLIO MANAGEMENT, AND ANALYSIS OF EQUITY INVESTMENTS

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READINGS AND LEARNING OUTCOME STATEMENTS

READINGS

The following material is a review of the Corporate Finance, Portfolio Management, and Analysis of Equity Investments principles designed to address the learning outcome statements set forth by CFA Institute.

STUDY SESSION 11

Reading Assignments

47. "Capital Budgeting," John D. Stowe and Jacques R. Gagné (CFA Institute, 2006) page 10
48. "Cost of Capital," Yves Courtois, Gene C. Lai, and Pamela P. Peterson (CFA Institute, 2006) page 30
49. "Capital Structure and Leverage," Raj Aggarwal, Cynthia Harrington, Adam Kobor, and Pamela P. Peterson (CFA Institute, 2006) page 42
50. "Dividends and Dividend Policy," George H. Troughton and Catherine E. Clark (CFA Institute, 2006) page 55
51. "The Corporate Governance of Listed Companies: A Manual for Investors," (CFA Institute, 2006) page 71

STUDY SESSION 12

Reading Assignments

52. "The Asset Allocation Decision," Ch. 2, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 82
53. "An Introduction to Portfolio Management," Ch. 7, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 88
54. "An Introduction to Asset Pricing Models," Ch. 8, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 106

STUDY SESSION 13

Reading Assignments

55. "Organization and Functioning of Securities Markets," Ch. 4, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 123
56. "Security-Market Indicator Series," Ch. 5, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 135
57. "Efficient Capital Markets," Ch. 6, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 145
58. "Market Efficiency and Anomalies," Ch. 1, *Beyond The Random Walk: A Guide to Stock Market Anomalies and Low-Risk Investing*, Vijay Singal (Oxford University Press, 2004) page 155

STUDY SESSION 14

Reading Assignments

59. "An Introduction to Security Valuation," Ch. 11, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 160
60. "Industry Analysis," Ch. 13, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 160
61. "Equity: Concepts and Techniques," Ch. 6, pp. 256–273, *International Investments*, 5th edition, Bruno Solnik and Dennis McLeavey (Addison Wesley, 2005) page 180
62. "Company Analysis and Stock Valuation," Ch. 14, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 186
63. "Technical Analysis," Ch. 15, *Investment Analysis and Portfolio Management*, 8th edition, Frank K. Reilly and Keith C. Brown (South-Western, 2005) page 192
64. "Introduction to Price Multiples," John D. Stowe, Thomas R. Robinson, Jerald E. Pinto, and Dennis W. McLeavey (AIMR, 2003) page 203

LEARNING OUTCOME STATEMENTS (LOS)

STUDY SESSION 11

The topical coverage corresponds with the following CFA Institute assigned reading:

47. **Capital Budgeting**

The candidate should be able to:

a. define the capital budgeting process, explain the administrative steps of the process, and categorize the capital projects which can be evaluated. (page 10)
b. summarize and explain the principles of capital budgeting, including the choice of the proper cash flows and the identification of the proper discount rate. (page 11)
c. explain how the following project interactions affect the evaluation of a capital project: (1) independent versus mutually exclusive projects, (2) project sequencing, and (3) unlimited funds versus capital rationing. (page 12)
d. calculate and interpret the results produced from each of the following methods when evaluating a single capital project: net present value (NPV), internal rate of return (IRR), payback period, discounted payback period, average accounting rate of return (AAR), and profitability index (PI). (page 13)
e. explain the NPV profile, compare and contrast the NPV and IRR methods when evaluating more than one capital project, and describe the multiple IRR and no-IRR problems that can arise when calculating an IRR. (page 20)
f. describe the relative popularity of the various capital budgeting methods and explain the importance of the NPV in estimating the value of a stock price. (page 22)

The topical coverage corresponds with the following CFA Institute assigned reading:

48. **Cost of Capital**

The candidate should be able to:

a. determine and interpret the weighted average cost of capital (WACC) of a company, and explain the adjustments to it that an analyst should make in developing a cost of capital for a specific project. (page 30)
b. describe the role of taxes in the cost of capital from the different capital sources. (page 30)
c. describe alternative methods of calculating the weights used in the weighted average cost of capital, including the use of the company's target capital structure. (page 32)

d. explain the analyst's concern with the marginal cost of capital in evaluating investment projects, and explain the use of the marginal cost of capital and the investment opportunity schedule in determining the optimal capital budget for a company. (page 32)
e. explain the marginal cost of capital's role in determining the net present value of a project. (page 33)
f. calculate and analyze the cost of fixed rate debt capital using the yield-to-maturity approach and the debt-rating approach. (page 34)
g. calculate the cost of noncallable, nonconvertible preferred stock. (page 34)
h. calculate and analyze the cost of equity capital using the capital asset pricing model approach, the dividend discount approach, and the bond yield plus risk premium approach. (page 35)

The topical coverage corresponds with the following CFA Institute assigned reading:

49. **Capital Structure and Leverage**

The candidate should be able to:

a. define and explain leverage, business risk, sales risk, operating risk, and financial risk (page 42)
b. calculate and interpret the degree of operating leverage, the degree of financial leverage, and the degree of total leverage. (page 42)
c. characterize the operating leverage, financial leverage, and total leverage of a company given a description of it. (page 45)
d. calculate the breakeven quantity of sales and determine the company's net income at various sales levels. (page 46)
e. describe the effect of financial leverage on a company's net income and return on equity. (page 48)
f. compare and contrast the risks of creditors and owners. (page 50)

The topical coverage corresponds with the following CFA Institute assigned reading:

50. **Dividends and Dividend Policy**

The candidate should be able to:

a. review cash dividends, stock dividends, stocks splits, and reverse stock splits and calculate and discuss their impact on a shareholder. (page 55)
b. compare the impact on shareholder wealth of a share repurchase and a cash dividend of equal amount. (page 58)
c. calculate the earnings per share effect of a share repurchase when the repurchase is made with borrowed funds and the company's after-tax cost of debt is greater (less) than its earnings yield. (page 59)
d. calculate the book value effect of a share repurchase when the market value of a share is greater (less) than book value per share. (page 60)
e. compare and contrast share repurchase methods. (page 61)
f. review dividend payment chronology including declaration, holder-of-record, ex-dividend, and payment dates and indicate when the share price will most likely reflect the dividend. (page 57)
g. summarize the factors affecting dividend payout policy. (page 61)
h. calculate the effective tax rate on a dollar of corporate earnings distributed as a dividend using the double-taxation, split-rate, and tax imputation systems. (page 62)
i. discuss the types of information that dividend initiations, increases, decreases, and omissions may convey, and cross-country differences in the signalling content of dividends. (page 64)

The topical coverage corresponds with the following CFA Institute assigned reading:

51. **The Corporate Governance of Listed Companies: A Manual for Investors**

The candidate should be able to:

a. define corporate governance. (page 71)

b. discuss and critique characteristics and practices related to board and committee independence, experience, compensation, external consultants and frequency of elections and determine whether they are supportive of shareowner protection. (page 71)
c. define board independence and explain the importance of independent board members in corporate governance. (page 72)
d. identify factors that indicate a board and its members possess the experience required to govern the company for the benefit of its shareowners. (page 72)
e. explain the provisions that should be included in a strong corporate code of ethics and the implications of a weak code of ethics with regard to related-party transactions and personal use of company assets. (page 73)
f. state the key areas of responsibility for which board committees are typically created and explain the criteria for assessing whether each committee is able to adequately represent shareowner interests. (page 74)
g. evaluate, from a shareowner's perspective, company policies related to voting rules, shareowner sponsored proposals, common stock classes and takeover defenses. (page 75)

STUDY SESSION 12

The topical coverage corresponds with the following CFA Institute assigned reading:

52. **The Asset Allocation Decision**

The candidate should be able to:

a. describe the steps in the portfolio management process and explain the reasons for a policy statement. (page 82)
b. explain why investment objectives should be expressed in terms of both risk and return and list the factors that may affect an investor's risk tolerance. (page 82)
c. describe the return objectives of capital preservation, capital appreciation, current income, and total return and describe the investment constraints of liquidity, time horizon, tax concerns, legal and regulatory factors, and unique needs and preferences. (page 83)
d. describe the importance of asset allocation, in terms of the percentage of a portfolio's return that can be explained by the target asset allocation and list reasons for the differences in the average asset allocation among citizens of different countries. (page 84)

The topical coverage corresponds with the following CFA Institute assigned reading:

53. **An Introduction to Portfolio Management**

The candidate should be able to:

a. define risk aversion and discuss evidence that suggests that individuals are generally risk averse. (page 88)
b. list the basic assumptions behind the Markowitz Portfolio Theory. (page 89)
c. compute the expected return for an individual investment and for a portfolio. (page 89)
d. compute the variance and standard deviation for an individual investment. (page 91)
e. compute the covariance of rates of return, and show how it is related to the correlation coefficient. (page 93)
f. list the components of the portfolio standard deviation formula, and explain which component is most important to consider when adding an investment to a portfolio. (page 96)
g. describe the efficient frontier and explain the implications for incremental returns as an investor assumes more risk. (page 99)
h. define optimal portfolio and show how each investor may have a different optimal portfolio. (page 100)

The topical coverage corresponds with the following CFA Institute assigned reading:

54. An Introduction to Asset Pricing Models

The candidate should be able to:

a. list the assumptions of the capital market theory. (page 106)
b. explain what happens to the expected return, the standard deviation of returns, and possible risk-return combinations when a risk-free asset is combined with a portfolio of risky assets. (page 106)
c. identify the market portfolio, and describe the role of the market portfolio in the formation of the capital market line (CML). (page 108)
d. define systematic and unsystematic risk and explain why an investor should not expect to receive additional return for assuming unsystematic risk. (page 109)
e. describe the capital asset pricing model, diagram the security market line (SML), and define beta. (page 111)
f. calculate and interpret using the SML, the expected return on a security, and evaluate whether the security is undervalued, overvalued, or properly valued. (page 113)
g. describe the effect on the SML of relaxing each of its main underlying assumptions line. (page 115)

STUDY SESSION 13

The topical coverage corresponds with the following CFA Institute assigned reading:

55. Organization and Functioning of Securities Markets

The candidate should be able to:

a. describe the characteristics of a well-functioning securities market. (page 123)
b. distinguish between competitive bids, negotiated sales, and private placements for issuing bonds. (page 123)
c. distinguish between primary and secondary capital markets, and explain how secondary markets support primary markets. (page 124)
d. distinguish between call and continuous markets. (page 124)
e. compare and contrast the structural differences among national stock exchanges, regional stock exchanges, and the over-the-counter (OTC) markets. (page 124)
f. compare and contrast major characteristics of exchange markets, including exchange membership, types of orders, and market makers. (page 125)
g. describe the process of selling a stock short and discuss an investor's likely motivation for selling short. (page 126)
h. describe the process of buying a stock on margin, compute the rate of return on a margin transaction, define maintenance margin and determine the stock price at which the investor would receive a margin call. (page 127)
i. discuss major effects of the institutionalization of securities markets. (page 128)

The topical coverage corresponds with the following CFA Institute assigned reading:

56. Security-Market Indexes

The candidate should be able to:

a. discuss the source and direction of bias exhibited by each of the three predominant weighting schemes, and compute a price-weighted, a market-weighted, and an unweighted index series for three stocks. (page 135)
b. compare and contrast major structural features of domestic and global stock indexes, bond indexes, and composite stock-bond indexes. (page 140)

The topical coverage corresponds with the following CFA Institute assigned reading:

57. **Efficient Capital Markets**

The candidate should be able to:

a. define an efficient capital market, discuss arguments supporting the concept of efficient capital markets, describe and contrast the forms of the efficient market hypothesis (EMH): weak, semistrong, and strong, and describe the tests used to examine the weak form, the semistrong form, and the strong form of the EMH. (page 145)
b. identify various market anomalies and explain their implications for the EMH, and explain the overall conclusions about each form of the EMH. (page 148)
c. explain the implications of stock market efficiency for technical analysis and fundamental analysis, discuss the implications of efficient markets for the portfolio management process and the role of the portfolio manager, and explain the rationale for investing in index funds. (page 148)

The topical coverage corresponds with the following CFA Institute assigned reading:

58. **Market Efficiency and Anomalies**

The candidate should be able to:

a. explain limitations to fully efficient markets. (page 155)
b. describe the limits of arbitrage to correct anomalies. (page 155)
c. illustrate why investors should be skeptical of anomalies. (page 156)

STUDY SESSION 14

The topical coverage corresponds with the following CFA Institute assigned reading:

59. **An Introduction to Security Valuation**

The candidate should be able to:

a. explain the top-down approach, and its underlying logic, to the security valuation process. (page 160)
b. explain the various forms of investment returns. (page 161)
c. calculate and interpret the value of a preferred stock, or of a common stock, using the dividend discount model (DDM). (page 161)
d. show how to use the DDM to develop an earnings multiplier model, and explain the factors in the DDM that affect a stock's price-to-earnings (P/E) ratio. (page 167)
e. explain the components of an investor's required rate of return (i.e., the real risk-free rate, the expected rate of inflation, and a risk premium) and discuss the risk factors to be assessed in determining a country risk premium for use in estimating the required return for foreign securities. (page 168)
f. estimate the implied dividend growth rate, given the components of the required return on equity and incorporating the earnings retention rate and current stock price. (page 169)
g. describe a process for developing estimated inputs to be used in the DDM, including the required rate of return and expected growth rate of dividends. (page 170)

The topical coverage corresponds with the following CFA Institute assigned reading:

60. **Industry Analysis**

The candidate should be able to describe how structural economic changes (e.g., demographics, technology, politics, and regulation) may affect industries. (page 171)

The topical coverage corresponds with the following CFA Institute assigned reading:

61. **Equity: Concepts and Techniques**

The candidate should be able to:

a. classify business cycle stages and identify, for each stage, attractive investment opportunities. (page 180)
b. discuss, with respect to global industry analysis, the key elements related to return expectations. (page 180)
c. describe the industry life cycle and identify an industry's stage in its life cycle. (page 181)
d. interpret and explain the significance of a concentration ratio and a Herfindahl index. (page 181)
e. discuss, with respect to global industry analysis, the elements related to risk, and describe the basic forces that determine industry competition. (page 182)

The topical coverage corresponds with the following CFA Institute assigned reading:

62. **Company Analysis and Stock Valuation**

The candidate should be able to:

a. differentiate between 1) a growth company and a growth stock, 2) a defensive company and a defensive stock, 3) a cyclical company and a cyclical stock, 4) a speculative company and a speculative stock and 5) a value stock and a growth stock. (page 186)
b. describe and estimate the expected earnings per share (EPS) and earnings multiplier for a company. (page 187)
c. calculate and compare the expected rate of return (based on the estimate of intrinsic value) to the required rate of return. (page 188)

The topical coverage corresponds with the following CFA Institute assigned reading:

63. **Technical Analysis**

The candidate should be able to:

a. explain the underlying assumptions of technical analysis and explain how technical analysis differs from fundamental analysis. (page 192)
b. discuss the advantages and challenges of technical analysis. (page 193)
c. identify examples of each of the major categories of technical indicators. (page 194)

The topical coverage corresponds with the following CFA Institute assigned reading:

64. **Introduction to Price Multiples**

The candidate should be able to:

a. discuss the rationales for the use of price to earnings (P/E), price to book value (P/BV), price to sales (P/S), and price to cash flow (P/CF) in equity valuation and discuss the possible drawbacks to the use of each price multiple. (page 203)
b. calculate and interpret P/E, P/BV, P/S, and P/CF. (page 203)

The following is a review of the Corporate Finance principles designed to address the learning outcome statements set forth by CFA Institute®. This topic is also covered in:

CAPITAL BUDGETING

Study Session 11

EXAM FOCUS

If you recollect little from your basic financial management course in college (or if you didn't take one) you will need to spend some time on this review and go through the examples quite carefully. To be prepared for the exam you need to know how to calculate all of the measures used to evaluate capital projects and the decision rules associated with them. Be sure you can interpret an NPV profile; one could be given as part of a question. Finally, know the reasoning behind the facts that (1) IRR and NPV give the same accept/reject decision for a single project and (2) IRR and NPV can give conflicting rankings for mutually exclusive projects.

LOS 47.a: Define the capital budgeting process, explain the administrative steps of the process, and categorize the capital projects which can be evaluated.

The **capital budgeting process** is the process of identifying and evaluating capital projects, that is, projects where the cash flow to the firm will be received over a period longer than a year. Any corporate decisions with an impact on future earnings can be examined using this framework. Decisions about whether to buy a new machine, expand business in another geographic area, move the corporate headquarters to Cleveland, or replace a delivery truck, to name a few, can be examined using a capital budgeting analysis.

For a number of good reasons, capital budgeting may be the most important responsibility that a financial manager has. First, since a capital budgeting decision often involves the purchase of costly long-term assets with lives of many years, the decisions made may determine the future success of the firm. Second, the principles underlying the capital budgeting process also apply to other corporate decisions, such as working capital management and making strategic mergers and acquisitions. Finally, making good capital budgeting decisions is consistent with management's primary goal of maximizing shareholder value.

The capital budgeting process has four administrative steps:

Step 1: *Idea generation.* The most important step in the capital budgeting process is generating good project ideas. Ideas can come from a number of sources including senior management, functional divisions, employees, or outside the company.

Step 2: *Analyzing project proposals.* Since the decision to accept or reject a capital project is based on the project's expected future cash flows, a cash flow forecast must be made for each project to determine its expected profitability.

Step 3: *Create the firm-wide capital budget.* Firms must prioritize profitable projects according to the timing of the project's cash flows, available company resources, and the company's overall strategic plan. Many projects that are attractive individually may not make sense strategically.

Step 4: *Monitoring decisions and conducting a post-audit.* It is important to follow up on all capital budgeting decisions. An analyst should compare the actual results to the projected results, and project managers should explain why projections did or did not match actual performance. Since the capital budgeting process is only as good as the estimates of the inputs into the model used to forecast cash flows, a post-audit should be used to identify systematic errors in the forecasting process and improve company operations.

Categories of Capital Budgeting Projects

Capital budgeting projects may be divided into the following categories:

- *Replacement projects to maintain the business* are normally made without detailed analysis. The only issues are whether the existing operations should continue and, if so, whether existing procedures or processes should be maintained.
- *Replacement projects for cost reduction* determine whether equipment that is obsolete, but still usable, should be replaced. A fairly detailed analysis is necessary in this case.
- *Expansion projects* are taken on to grow the business and involve a complex decision making process since they require an explicit forecast of future demand. A very detailed analysis is required.
- *New product or market* development also entails a complex decision making process that will require a detailed analysis due to the large amount of uncertainty involved.
- *Mandatory projects* may be required by a governmental agency or insurance company and typically involve safety-related or environmental concerns. These projects typically generate little to no revenue, but they accompany new revenue-producing projects undertaken by the company.
- *Other projects.* Some projects are not easily analyzed through the capital budgeting process. Such projects may include a pet project of senior management (e.g., corporate perks), or a high-risk endeavor that is difficult to analyze with typical capital budgeting assessment methods (e.g., research and development projects).

LOS 47.b: Summarize and explain the principles of capital budgeting, including the choice of the proper cash flows and the identification of the proper discount rate.

The capital budgeting process involves five key principles:

1. *Decisions are based on cash flows, not accounting income.* The relevant cash flows to consider as part of the capital budgeting process are **incremental cash flows**, the changes in cash flows that will occur if the project is undertaken.

   Sunk costs are costs that cannot be avoided, even if the project is not undertaken. Since these costs are not affected by the accept/reject decision, they should not be included in the analysis. An example of a sunk cost is a consulting fee paid to a marketing research firm to estimate demand for a new product prior to a decision on the project.

   Externalities are the effects the acceptance of a project may have on other firm cash flows. The primary one is a negative externality called **cannibalization**, which occurs when a new project takes sales from an existing product. When considering externalities, the full implication of the new project (loss in sales of existing products) should be taken into account. An example of cannibalization is when a soft drink company introduces a diet version of an existing beverage. The analyst should subtract the lost sales of the existing beverage from the expected new sales of the diet version when estimated incremental project cash flows. A positive externality exists when doing the project would have a positive effect on sales of a firm's other project lines.

2. *Cash flows are based on opportunity costs.* Opportunity costs are cash flows that a firm will lose by undertaking the project under analysis. These are cash flows generated by an asset the firm already owns, that would be forgone if the project under consideration is undertaken. Opportunity costs should be included in project costs. For example, when building a plant, even if the firm already owns the land, the cost of the land should be charged to the project since it could be sold if not used.

3. *The timing of cash flows is important.* Capital budgeting decisions account for the time value of money, which means that cash flows received earlier are worth more than cash flows to be received later.

4. *Cash flows are analyzed on an after-tax basis.* The impact of taxes must be considered when analyzing all capital budgeting projects. Firm value is based on cash flows they get to keep, not those they send to the government.

5. *Financing costs are reflected in the project's required rate of return.* Do not consider financing costs specific to the project when estimating incremental cash flows. The discount rate used in the capital budgeting analysis takes account of the firm's cost of capital. Only projects that are expected to return more than the cost of the capital needed to fund them will increase the value of the firm.

LOS 47.c: Explain how the following project interactions affect the evaluation of a capital project: (1) independent versus mutually exclusive projects, (2) project sequencing, and (3) unlimited funds versus capital rationing.

Independent Versus Mutually Exclusive Projects

Independent projects are projects that are unrelated to each other, and allow for each project to be evaluated based on its own profitability. For example, if projects A and B are independent, and both projects are profitable, then the firm could accept both projects. **Mutually exclusive** means that only one project in a set of possible projects can be accepted and that the projects compete with each other. If projects A and B were mutually exclusive, the firm could accept either Project A or Project B, but not both. A capital budgeting decision between two different stamping machines with different costs and output would be an example of choosing between two mutually exclusive projects.

Project Sequencing

Some projects must be undertaken in a certain order, or sequence, so that investing in a project today creates the opportunity to invest in other projects in the future. For example, if a project undertaken today is profitable, that may create the opportunity to invest in a second project a year from now. However, if the project undertaken today turns out to be unprofitable, the firm will not invest in the second project.

Unlimited Funds Versus Capital Rationing

If a firm has unlimited access to capital, the firm can undertake all projects with expected returns that exceed the cost of capital. Many firms have constraints on the amount of capital they can raise, and must use *capital rationing*. If a firm's profitable project opportunities exceed the amount of funds available, the firm must ration, or prioritize, its capital expenditures with the goal of achieving the maximum increase in value for shareholders given its available capital.

LOS 47.d: Calculate and interpret the results produced from each of the following methods when evaluating a single capital project: net present value (NPV), internal rate of return (IRR), payback period, discounted payback period, average accounting rate of return (AAR), and profitability index (PI).

Net Present Value (NPV)

We first examined the calculation of net present value (NPV) in Quantitative Methods. The NPV is the sum of the present values of all the expected incremental cash flows if a project is undertaken. The discount rate used is the firm's cost of capital, adjusted for the risk level of the project. For a normal project, with an initial cash outflow followed by a series of expected after-tax cash inflows, the NPV is the present value of the expected inflows minus the initial cost of the project.

$$NPV = CF_0 + \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \ldots + \frac{CF_n}{(1+k)^n} = \sum_{t=0}^{n} \frac{CF_t}{(1+k)^t}$$

where:
CF_0 = the initial investment outlay (a negative cash flow)
CF_t = after tax cash flow at time t
k = required rate of return for project

A positive NPV project is expected to increase shareholder wealth, a negative NPV project is expected to decrease shareholder wealth, and a zero NPV project has no expected effect on shareholder wealth.

For *independent* projects, the *NPV decision rule* is simply to accept any project with a positive NPV and to reject any project with a negative NPV.

Example: NPV analysis

Using the project cash flows presented in Figure 1, compute the NPV of each project's cash flows and determine for each project whether it should be accepted or rejected. Assume that the cost of capital is 10%.

Figure 1: Expected Net After-Tax Cash Flows

Year (t)	*Project A*	*Project B*
0	–$2,000	–$2,000
1	1,000	200
2	800	600
3	600	800
4	200	1,200

Answer:

$$NPV_A = -2{,}000 + \frac{1{,}000}{(1.1)^1} + \frac{800}{(1.1)^2} + \frac{600}{(1.1)^3} + \frac{200}{(1.1)^4} = \$157.64$$

$$NPV_B = -2{,}000 + \frac{200}{(1.1)^1} + \frac{600}{(1.1)^2} + \frac{800}{(1.1)^3} + \frac{1{,}200}{(1.1)^4} = \$98.36$$

You may calculate the NPV directly by using the cash flow (CF) keys on your calculator. The process is illustrated in Figures 2 and 3 for project A.

Figure 2: Calculating NPV_A With the TI Business Analyst II Plus

Key Strokes	*Explanation*	*Display*
[CF] [2nd] [CLR WORK]	Clear memory registers	CF0 = 0.00000
2,000 [+/–] [ENTER]	Initial cash outlay	CF0 = –2,000.00000
[↓] 1,000 [ENTER]	Period 1 cash flow	C01 = 1,000.00000
[↓]	Frequency of cash flow 1	F01 = 1.00000
[↓] 800 [ENTER]	Period 2 cash flow	C02 = 800.00000
[↓]	Frequency of cash flow 2	F02 = 1.00000
[↓] 600 [ENTER]	Period 3 cash flow	C03 = 600.00000
[↓]	Frequency of cash flow 3	F03 = 1.00000
[↓] 200 [ENTER]	Period 4 cash flow	C04 = 200.00000
[↓]	Frequency of cash flow 4	F04 = 1.00000
[NPV] 10 [ENTER]	10% discount rate	I = 10.00000
[↓] [CPT]	Calculate NPV	NPV = 157.63951

Figure 3: Calculating NPV_A With the HP12C

Key Strokes	*Explanation*	*Display*
[f]→[FIN] → [f] → [REG]	Clear memory registers	0.00000
[f] [5]	Display 5 decimals. You only need to do this once.	0.00000
2,000 [CHS] [g] [CF0]	Initial cash outlay	–2,000.00000
1,000 [g] [CFj]	Period 1 cash flow	1,000.00000
800 [g] [CFj]	Period 2 cash flow	800.00000
600 [g] [CFj]	Period 3 cash flow	600.00000
200 [g] [CFj]	Period 4 cash flow	200.00000
10 [i]	10% discount rate	10.00000
[f] [NPV]	Calculate NPV	157.63951

Both Project A and Project B have positive NPVs, so both should be accepted.

Internal Rate of Return (IRR)

For a normal project, the **internal rate of return** (IRR) is the discount rate that makes the present value of the expected incremental after-tax cash inflows just equal to the initial cost of the project. More generally, the IRR is the discount rate that makes the present values of a project's estimated cash inflows equal to the present value of the project's estimated cash outflows. That is, IRR is the discount rate that makes the following relationship hold:

PV (inflows) = PV (outflows)

The IRR is also the discount rate for which the NPV of a project is equal to zero.

$$NPV = 0 = CF_0 + \frac{CF_1}{(1+IRR)^1} + \frac{CF_2}{(1+IRR)^2} + \ldots + \frac{CF_n}{(1+IRR)^n} = \sum_{t=0}^{n} \frac{CF_t}{(1+IRR)^t}$$

To calculate the IRR, you may use the trial-and-error method. That is, just keep guessing IRRs until you get the right one, or you may use a financial calculator.

IRR decision rule: First, determine the required rate of return for a given project. This is usually the firm's cost of capital. Note that the required rate of return may be higher or lower than the firm's cost of capital to adjust for differences between project risk and the firm's average project risk.

If IRR > the required rate of return, accept the project.

If IRR < the required rate of return, reject the project.

Example: IRR

Continuing with the cash flows presented in Figure 1 for projects A and B, compute the IRR for each project and determine whether to accept or reject each project under the assumptions that the projects are independent and that the required rate of return is 10%.

Answer:

$$\text{Project A: } 0 = -2{,}000 + \frac{1{,}000}{(1+IRR_A)^1} + \frac{800}{(1+IRR_A)^2} + \frac{600}{(1+IRR_A)^3} + \frac{200}{(1+IRR_A)^4}$$

$$\text{Project B: } 0 = -2{,}000 + \frac{200}{(1+IRR_B)^1} + \frac{600}{(1+IRR_B)^2} + \frac{800}{(1+IRR_B)^3} + \frac{1{,}200}{(1+IRR_B)^4}$$

With the cash flows entered as in Figures 2 or 3, (if you haven't changed them, they are still there from the calculation of NPV)

With the TI calculator the IRR can be calculated with:

[IRR] [CPT] to get 14.4888(%) for Project A and 11.7906(%) for Project B.

With the HP12C, the IRR can be calculated with:

[f] [IRR]

Both projects should be accepted because their IRRs are greater than the 10% required rate of return.

Payback Period

The **payback period** (PBP) is the number of years it takes to recover the initial cost of an investment.

Example: Payback period

Calculate the payback periods for the two projects that have the cash flows presented in Figure 1. Note the Year 0 cash flow represents the initial cost of each project.

Answer:

Note that the cumulative net cash flow (NCF) is just the running total of the cash flows at the end of each time period. Payback will occur when the cumulative NCF equals zero. To find the payback periods, construct the following table:

Figure 4: Cumulative Net Cash Flows

	Year (t)	*0*	*1*	*2*	*3*	*4*
Project A	Net cash flow	–2,000	1,000	800	600	200
	Cumulative NCF	–2,000	–1,000	–200	400	600
Project B	Net cash flow	–2,000	200	600	800	1,200
	Cumulative NCF	–2,000	–1,800	–1,200	–400	800

The payback period is determined from the cumulative net cash flow table as follows:

$$\text{payback period} = \text{full years until recovery} + \frac{\text{unrecovered cost at the beginning of last year}}{\text{cash flow during the last year}}$$

$$\text{payback period A} = 2 + \frac{200}{600} = 2.33 \text{ years}$$

$$\text{payback period B} = 3 + \frac{400}{1200} = 3.33 \text{ years}$$

Since the payback period is a measure of liquidity, for a firm with liquidity concerns, the shorter a project's payback period, the better. However, project decisions should not be made on the basis of their payback periods because of its drawbacks.

The main drawbacks of the payback period are that it does not take into account either the time value of money or cash flows beyond the payback period, which means terminal or salvage value wouldn't be considered. These drawbacks mean that the payback period is useless as a measure of profitability.

The main benefit of the payback period is that it is a good measure of project liquidity. Firms with limited access to additional liquidity often impose a maximum payback period, and then use a measure of profitability, such as NPV or IRR, to evaluate projects that satisfy this maximum payback period constraint.

Professor's Note: If you have the Professional model of the TI calculator, you can easily calculate the payback period and the discounted payback period (which follows). Once NPV is displayed, use the down arrow to scroll through NFV (net future value), to PB (payback), and DPB (discounted payback). You must use the compute key when "PB=" is

displayed. If the annual net cash flows are equal, the payback period is simply project cost divided by the annual cash flow.

Discounted Payback Period

The **discounted payback method** uses the present values of the project's estimated cash flows. It is the number of years it takes a project to recover its initial investment in present value terms, and therefore must be greater than the payback period without discounting.

Example: Discounted payback method

Compute the discounted payback period for projects A and B described in Figure 5. Assume that the firm's cost of capital is 10% and the firm's maximum discounted payback period is four years.

Figure 5: Cash Flows for Projects A and B

	Year (t)	*0*	*1*	*2*	*3*	*4*
Project A	Net Cash Flow	–2,000	1,000	800	600	200
	Discounted NCF	–2,000	910	661	451	137
	Cumulative DNCF	–2,000	–1,090	–429	22	159
Project B	Net Cash Flow	–2,000	200	600	800	1,200
	Discounted NCF	–2,000	182	496	601	820
	Cumulative DNCF	–2,000	–1,818	–1,322	–721	99

Answer:

$$\text{discounted payback A} = 2 + \frac{429}{451} = 2.95 \text{ years}$$

$$\text{discounted payback B} = 3 + \frac{721}{820} = 3.88 \text{ years}$$

The discounted payback period addresses one of the drawbacks of the payback period by discounting cash flows at the project's required rate of return. However, the discounted payback period still does not consider any cash flows beyond the payback period, which means that it is a poor measure of profitability. Again, its use is primarily as a measure of liquidity.

Average Accounting Rate of Return (AAR)

The **average accounting rate of return** (AAR) is defined as the ratio of a project's average net income to its average book value. In equation form, this is expressed as:

$$\text{AAR} = \frac{\text{average net income}}{\text{average book value}}$$

Example: Average accounting rate of return

Presstech Printing Company invests $400,000 in a project that is depreciated on a straight-line basis over four years to a zero salvage value. Sales revenues, operating expenses, and net income for each year are shown in Figure 6. Calculate the AAR of the project.

Figure 6: Net Income for Calculating AAR

	Year 1	*Year 2*	*Year 3*	*Year 4*
Sales	$320,000	$360,000	$420,000	$280,000
Cash expenses	150,000	140,000	200,000	160,000
Depreciation	100,000	100,000	100,000	100,000
Earnings before taxes	70,000	120,000	120,000	20,000
Taxes (at 30%)	21,000	36,000	36,000	6,000
Net income	49,000	84,000	84,000	14,000

Answer:

For the 4-year period, the average net income is:

($49,000 + $84,000 + $84,000 + $14,000) / 4 = $57,750

The initial book value is $400,000, declining by $100,000 per year until the final book value is $0. The average book value for this asset is:

($400,000 – $0) / 2 = $200,000

The average accounting rate of return is:

$$\text{AAR} = \frac{\text{average net income}}{\text{average book value}} = \frac{\$57,750}{\$200,000} = 0.28875 = 28.9\%$$

The primary advantage of the AAR is that it is relatively easy to calculate. However, the AAR has some important disadvantages. The AAR is based on accounting income, and not on cash flows, which violates one of the basic principles of capital budgeting. In addition, the AAR does not account for the time value of money, making it a poor measure of profitability.

Professor's Note: In the accounting material, we usually calculated depreciation with an estimate of the actual salvage value of the asset. In capital budgeting, we usually assume a zero salvage value because, for tax reporting, the firm benefits from taking the most rapid depreciation allowed. For financial reporting, the goal should be to give users of financial statements the most accurate information on the true economic depreciation of the asset.

Profitability Index (PI)

The **profitability index** (PI) is the present value of a project's future cash flows divided by the initial cash outlay.

$$\text{PI} = \frac{\text{PV of future cash flows}}{\text{CF}_0} = 1 + \frac{\text{NPV}}{\text{CF}_0}$$

As you can see, the profitability index is closely related to the NPV. The PI is the ratio of the present value of future cash flows to the initial cash outlay, while the NPV is the difference between the present value of future cash flows and the initial cash outlay.

If the NPV of a project is positive, the PI will be greater than one. If the NPV is negative, the PI will be less than one. It follows that the *decision rule* for the PI is:

If PI > 1.0, accept the project.

If PI < 1.0, reject the project.

Example: Profitability index

Going back to our original example, calculate the PI for Projects A and B. Note that Figure 1 has been reproduced as Figure 7.

Figure 7: Expected Net After-Tax Cash Flows

Year (t)	*Project A*	*Project B*
0	–$2,000	–$2,000
1	1,000	200
2	800	600
3	600	800
4	200	1,200

Answer:

$$\text{PV future cash flows}_A = \frac{1{,}000}{(1.1)^1} + \frac{800}{(1.1)^2} + \frac{600}{(1.1)^3} + \frac{200}{(1.1)^4} = \$2{,}157.64$$

$$PI_A = \frac{\$2{,}157.64}{\$2{,}000} = 1.079$$

$$\text{PV future cash flows}_B = \frac{200}{(1.1)^1} + \frac{600}{(1.1)^2} + \frac{800}{(1.1)^3} + \frac{1{,}200}{(1.1)^4} = \$2{,}098.36$$

$$PI_B = \frac{\$2{,}098.36}{\$2{,}000} = 1.049$$

Decision: If projects A and B are independent, accept both projects A and B since PI > 1 for both projects.

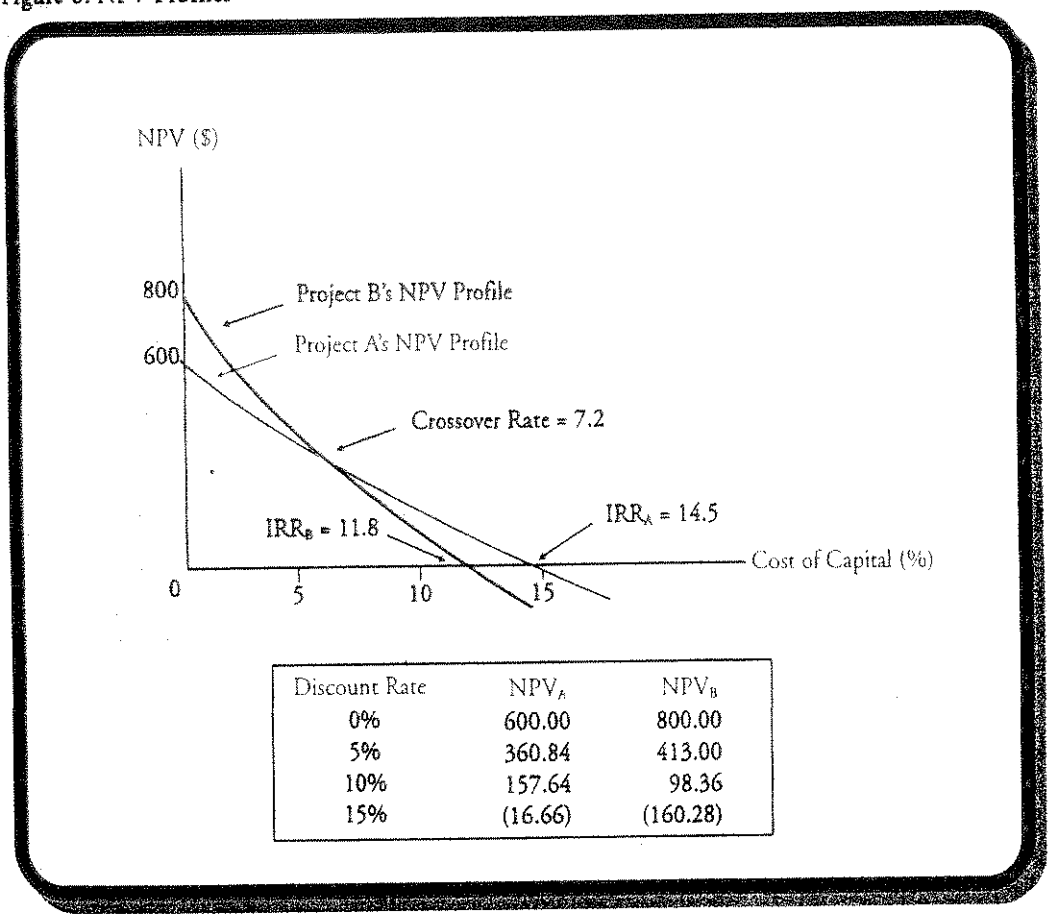
Professor's Note: The accept/reject decision rule here is exactly equivalent to both the NPV and IRR decision rules. That is, if PI > 1, then the NPV must be positive, and the IRR must be greater than the discount rate. Note also that once you have the NPV, you can just add back the initial outlay to get the PV of the cash inflows used here. Recall that the NPV of Project B is $98.36 with an initial cost of $2,000. PI is simply (2,000 + 98.36) / 2000.

LOS 47.e: Explain the NPV profile, compare and contrast the NPV and IRR methods when evaluating more than one capital project, and describe the multiple IRR and no-IRR problems that can arise when calculating an IRR.

A project's **NPV profile** is a graph that shows a project's NPV for different discount rates. The NPV profiles for the two projects described in Figure 1 are presented in Figure 8. The discount rates are on the x-axis of the NPV profile, and the corresponding NPVs are plotted on the y-axis.

Note that the projects' IRRs are the discount rates where the NPV profiles intersect the x-axis, since these are the discount rates for which NPV equals zero. Recall that the IRR is the discount rate that results in an NPV of zero.

Figure 8: NPV Profiles



Discount Rate	NPV_A	NPV_B
0%	600.00	800.00
5%	360.84	413.00
10%	157.64	98.36
15%	(16.66)	(160.28)

Also notice in Figure 8 that the NPV profiles intersect. They intersect at the discount rate for which NPVs of the projects are equal. At discount rates below 7.2% (to the left of the intersection), Project B has the greater NPV, and at discount rates above 7.2%, Project A has a greater NPV. Clearly, the discount rate used in the analysis can determine which one of two mutually exclusive projects will be accepted.

The NPV profiles for Projects A and B intersect because of a difference in the timing of the cash flows. Examining the cash flows for the projects (Figure 2), we can see that the total cash inflows for Project B are greater ($2,800) than those of Project A ($2,600). Since they both have the same initial cost ($2,000), at a discount rate of zero, Project B has a greater NPV (2,800 – 2,000 = $800) than Project A (2,600 – 2000 = $600).

We can also see that the cash flows for Project B come later in the project's life. That's why the NPV of Project B falls faster than the NPV of Project A as the discount rate increases, and the NPVs are eventually equal at a discount rate of 7.2%. At discount rates above 7.2%, the fact that the total cash flows of Project B are greater in

nominal dollars is overridden by the fact that Project B's cash flows come later in the project's life than those of Project A.

The Relative Advantages and Disadvantages of the NPV and IRR Methods

A key advantage of NPV is that it is a direct measure of the expected increase in the value of the firm. NPV is the theoretically best method. Its main weakness is that it does not include any consideration of the size of the project. For example, an NPV of $100 is great for a project costing $100 but not so great for a project costing $1 million.

A key advantage of IRR is that it measures profitability as a percentage, showing the return on each dollar invested. The IRR provides information on the margin of safety that the NPV does not. From the IRR, we can tell how much below the IRR (estimated return) the actual project return could fall, in percentage terms, before the project becomes uneconomic (has a negative NPV).

The *disadvantages* of the IRR method are (1) the possibility of producing rankings of mutually exclusive projects different from those from NPV analysis, and (2) the possibility that there are multiple IRRs or no IRR for a project.

Conflicting Project Rankings

For Projects A and B from our examples we noted that $IRR_A > IRR_B$, 14.5% > 11.8%. In Figure 8 we illustrated that for discount rates less than 7.2%, the $NPV_B > NPV_A$. When such a conflict occurs, the NPV method is preferred because it identifies the project that is expected to produce the greater increase in the value of the firm. Recall that the reason for different NPV rankings at different discount rates was the difference in the timing of the cash flows between the two projects.

Another reason, besides cash flow timing differences, that NPV and IRR may give conflicting project rankings is differences in project size. Consider two projects, one with an initial outlay of $100,000, and one with an initial outlay of $1 million. The smaller project may have a higher IRR, but the increase in firm value (NPV) may be small compared to the increase in firm value (NPV) of the larger project, even though its IRR is lower.

It is sometimes said that the NPV method implicitly assumes that project cash flows can be reinvested at the discount rate used to calculate NPV. This is a realistic assumption, since it is reasonable to assume that project cash flows could be used to reduce the firm's capital requirements. Any funds that are used to reduce the firm's capital requirements allow the firm to avoid the cost of capital on those funds. Just by reducing its equity capital and debt, the firm could "earn" its cost of capital on funds used to reduce its capital requirements. If we were to rank projects by their IRRs, we would be implicitly assuming that project cash flows could be reinvested at the project's IRR. This is unrealistic and, strictly speaking, if the firm could earn that rate on invested funds, that rate should be the one used to discount project cash flows.

The "Multiple IRR" and "No IRR" Problems

If a project has cash outflows during its life or at the end of its life in addition to its initial cash outflow, the project is said to have a *non-normal* cash-flow pattern. Projects with such cash flows may have more than one IRR (there may be more than one discount rate that will produce an NPV equal to zero).

It is also possible to have a project where there is no discount rate that results in a zero NPV, that is, the project does not have an IRR. A project with no IRR may actually be a profitable project. The lack of an IRR results from the project having non-normal cash flows, where mathematically, no IRR exists. NPV does not have this problem and produces theoretically correct decisions for projects with non-normal cash flow patterns.

Neither of these problems can arise with the NPV method. If a project has non-normal cash flows, the NPV method will give the appropriate accept/reject decision.

LOS 47.f: Describe the relative popularity of the various capital budgeting methods and explain the importance of the NPV in estimating the value of a stock price.

Despite the superiority of NPV and IRR methods for evaluating projects, surveys of corporate financial managers show that a variety of methods are used. The surveys show that the capital budgeting method used by a company varied according to four general criteria:

- **Location.** European countries tended to use the payback period method as much or more than the IRR and NPV methods.
- **Size of the company.** The larger the company, the more likely it was to use discounted cash flow techniques such as the NPV and IRR methods.
- **Public vs. private.** Private companies used the payback period more often than public companies. Public companies tended to prefer discounted cash flow methods.
- **Management education.** The higher the level of education (i.e., MBA), the more likely the company was to use discounted cash flow techniques such as the NPV and IRR methods.

The Relationship Between NPV and Stock Price

Since the NPV method is a direct measure of the expected change in firm value from undertaking a capital project, it is also the criterion most related to stock prices. In theory, a positive NPV project should cause a proportionate increase in a company's stock price.

Example: Relationship Between NPV and Stock Price

Presstech is investing $500 million in new printing equipment. The present value of the future after-tax cash flows resulting from the equipment is $750 million. Presstech currently has 100 million shares outstanding, with a current market price of $45 per share. Assuming that this project is new information and is independent of other expectations about the company, calculate the effect of the new equipment on the value of the company, and the effect on Presstech's stock price.

Answer:

NPV of the new printing equipment project = $750 million – $500 million = $250 million.

Value of company prior to new equipment project = 100 million shares × $45 per share = $4.5 billion.

Value of company after new equipment project = $4.5 billion + $250 million = $4.75 billion.

Price per share after new equipment project = $4.75 billion / 100 million shares = $47.50

The stock price should increase from $45.00 per share to $47.50 per share as a result of the project.

In reality, the impact of a project on the company's stock price is more complicated than the example above. A company's stock price is a function of the present value of its expected future earnings stream. As a result, changes in the stock price will result more from changes in *expectations* about a project's profitability. If a company announces a project for which managers expect a positive NPV, but analysts expect a lower level of profitability from the project than the company does, the stock price may actually drop on the announcement. In another example, a project announcement may be taken as a signal about other future capital projects, resulting in a stock price increase that is much greater than what the NPV of the announced project would justify.

KEY CONCEPTS

1. Capital budgeting is the process of evaluating expenditures on assets whose cash flows are expected to extend beyond one year.
2. There are four administrative steps to the capital budgeting process:
   - Generating investment ideas.
   - Analyzing project ideas.
   - Creating the firm-wide capital budget.
   - Monitoring decisions and conducting a post-audit.
3. Categories of capital projects include:
   - Replacement projects for maintaining the business.
   - Replacement projects for cost reduction purposes.
   - Expansion projects.
   - New product/market development.
   - Mandatory environmental/regulatory projects.
   - Other projects, such as pet projects of the CEO.
4. The capital budgeting process is based on five key principles:
   - Decisions are based on after-tax cash flows, not accounting income.
   - Cash flow estimates include cash opportunity costs.
   - Timing of cash flows is important.
   - Financing costs and the project's risk are reflected in the required rate of return used to evaluate the project.
5. Mutually exclusive means that only one of a set of projects can be selected. Independent projects are unrelated to one another, so each can be evaluated on its own.
6. Project sequencing refers to projects that follow a certain sequence so that investing in a project today creates opportunities to invest in other projects in the future.
7. If a firm has unlimited funds, it can undertake all profitable projects. If additional capital is limited, the firm must ration its capital to fund that group of projects that are expected to produce the greatest increase in firm value.
8. The NPV of a project is the present value of future cash flows discounted at the firm's cost of capital, less the project's initial cost, and can be interpreted as the expected change in shareholder wealth from undertaking the project.
9. The IRR is the rate of return that equates the PVs of the project's expected cash inflows and outflows, and is also the discount rate that will produce an NPV of zero.
10. The payback period is the number of years required to recover the original cost of the investment, and the discounted payback period is the time it takes to recover the investment using the present values of future cash flows.
11. The AAR is the ratio of a project's average net income to its average book value.
12. The PI is the ratio of the present value of a project's future cash flows to its initial cash outlay.
13. The NPV profile shows a project's NPV as a function of the discount rate used.
14. The IRR is easily interpreted because it's a rate of return, can provide information on a project's margin of safety, and gives identical accept/reject decisions to the NPV method for independent projects. However, it can give project rankings that conflict with the NPV method when project size or cash flow patterns differ, and non-normal projects can have no IRR or multiple IRRs.
15. NPV analysis is theoretically preferred in all applications.
16. Despite the theoretical superiority of discounted cash flow techniques such as NPV, studies show that companies use a variety of methods to evaluate capital projects, with small companies, private companies, and companies outside the U.S. more likely to use simpler techniques such as payback period.
17. The NPV method is a direct measure of the expected change in firm value, and as a result, is also the criterion most closely related to stock price changes.

CONCEPT CHECKERS: CAPITAL BUDGETING

1. Which of the following statements concerning the principles underlying the capital budgeting process is TRUE?
   A. Cash flows are analyzed on a pre-tax basis.
   B. Financing costs should be added to the required rate of return on the project.
   C. Cash flows should be based on opportunity costs.
   D. The net income for a project is essential for making a correct capital budgeting decision.

2. Which of the following statements about the payback period method is FALSE? The:
   A. payback period provides a rough measure of a project's liquidity.
   B. payback method considers all cash flows throughout the entire life of a project.
   C. cumulative net cash flow is the running total through time of a project's cash flows.
   D. payback period is the number of years it takes to recover the original cost of the investment.

3. Which of the following statements about NPV and IRR is FALSE?
   A. The discount rate that gives an NPV of zero is the project's IRR.
   B. The IRR is the discount rate that equates the present value of the cash inflows with the present value of outflows.
   C. For mutually exclusive projects, if the NPV method and the IRR method give conflicting rankings, you should use the IRRs to select the project.
   D. The NPV method assumes that cash flows will be reinvested at the cost of capital, while IRR rankings implicitly assume that cash flows are reinvested at the IRR.

4. Which of the following statements is FALSE? The discounted payback:
   A. method frequently ignores terminal values.
   B. method can give results that conflict with the NPV method.
   C. period is generally shorter than the regular payback.
   D. period is the time it takes for the present value of the project's cash inflows to equal the initial cost of the investment.

5. Which of the following statements about NPV and IRR is FALSE?
   A. The IRR can be positive even if the NPV is negative.
   B. The NPV method is not affected by the multiple IRR problem.
   C. When the IRR is equal to the cost of capital, the NPV will be zero.
   D. The NPV will be positive if the IRR is less than the cost of capital.

Use the following data to answer Questions 6 through 10.

A company is considering the purchase of a copier that costs $5,000. Assume a required rate of return of 10% and the following cash flow schedule:

- Year 1: $3,000.
- Year 2: $2,000.
- Year 3: $2,000.

6. What is the project's payback period?
   A. 1.5 years.
   B. 2.0 years.
   C. 2.5 years.
   D. 3.0 years.

7. What is the project's discounted payback period?
   A. 1.4 years.
   B. 2.0 years.
   C. 2.4 years.
   D. 2.6 years.

8. What is the project's NPV?
   A. –$309.
   B. +$243.
   C. +$883.
   D. +$1,523.

9. What is the project's IRR (approximately)?
   A. 5%.
   B. 10%.
   C. 15%.
   D. 20%.

10. What is the project's profitability index (PI)?
    A. 0.18.
    B. 0.72.
    C. 1.18.
    D. 1.72.

11. An analyst has gathered the following information about a company:
    - Cost $10,000.
    - Annual cash inflow $4,000.
    - Life 4 years.
    - Cost of capital 12%.

    Which of the following statements about the project is FALSE? The:
    A. payback period is 2.5 years.
    B. IRR of the project is 21.9%; accept the project.
    C. discounted payback period is 3.5 years.
    D. NPV of the project is +$2,149; accept the project.

Use the following data for Questions 12 and 13.

An analyst has gathered the following data about two projects, each with a 12% required rate of return.

	Project A	*Project B*
Initial cost	$15,000	$20,000
Life	5 years	4 years
Cash inflows	$5,000/year	$7,500/year

12. If the projects are independent, the company should:
    A. reject both projects.
    B. accept Project A and reject Project B.
    C. reject Project A and accept Project B.
    D. accept both projects.

13. If the projects are mutually exclusive, the company should:
A. reject both projects.
B. accept A and reject B.
C. reject A and accept B.
D. accept both projects.

14. The NPV profiles of two projects will intersect if the projects have different:
A. sizes and different lives.
B. IRRs and different lives.
C. IRRs and different costs of capital.
D. sizes and different costs of capital.

15. The post-audit is used to:
A. improve cash flow forecasts and stimulate management to improve operations and bring results into line with forecasts.
B. improve cash flow forecasts and eliminate potentially profitable but risky projects.
C. stimulate management to improve operations and bring results into line with forecasts and eliminate potentially profitable but risky projects.
D. improve cash flow forecasts, stimulate management to improve operations and bring results into line with forecasts, and eliminate potentially profitable but risky projects.

16. Columbus Sign Company invests $270,000 in a project that is depreciated on a straight-line basis over three years to a zero salvage value. The relevant details for the project over its 3-year life are shown below:

	Year 1	*Year 2*	*Year 3*
Sales	$220,000	$190,000	$200,000
Cash expenses	50,000	40,000	60,000
Depreciation	90,000	90,000	90,000
Earnings before taxes	80,000	60,000	50,000
Taxes (at 30%)	24,000	18,000	15,000
Net income	56,000	42,000	35,000

The AAR for the project is *closest* to:
A. 8.9%.
B. 16.4%.
C. 32.8%.
D. 49.3%.

17. Based on surveys of comparable firms, which of the following firms would be *most likely* to use NPV as its preferred method for evaluating capital projects?
A. A small public industrial company located in France.
B. A private company located in the United States.
C. A small public retailing firm located in the United States.
D. A large public company located in the United States.

18. Fullen Machinery is investing $400 million in new industrial equipment. The present value of the future after-tax cash flows resulting from the equipment is $700 million. Fullen currently has 200 million shares of common stock outstanding, with a current market price of $36 per share. Assuming that this project is new information and is independent of other expectations about the company, what is the theoretical effect of the new equipment on Fullen's stock price?
A. The stock price will remain unchanged.
B. The stock price will increase to $37.50.
C. The stock price will decrease to $33.50.
D. The stock price will increase to $39.50.

ANSWERS – CONCEPT CHECKERS: CAPITAL BUDGETING

1. C Cash flows are based on opportunity costs. The cost of capital is implicit in the project's required rate of return; adding the cost of capital to the required return would be double counting. Cash flows are analyzed on an after-tax basis. Accounting net income, which includes non-cash expenses, is irrelevant; incremental cash flows are essential for making correct capital budgeting decisions.

2. B The payback period ignores cash flows that go beyond the payback period.

3. C NPV should always be used if NPV and IRR give conflicting decisions.

4. C The discounted payback is longer than the regular payback because cash flows are discounted to their present value.

5. D If IRR is less than the cost of capital, the result will be a negative NPV.

6. B Cash flow (CF) after year 2 = –5,000 + 3,000 + 2,000 = 0. Cost of copier is paid back in the first two years.

7. C Year 1 discounted cash flow = 3,000 / 1.10 = 2,727; year 2 DCF = 2,000 / 1.10^2 = 1,653; year 3 DCF = 2,000 / 1.10^3 = 1,503. CF required after year 2 = –5,000 + 2,727 +1,653 = -$620. 620 / year 3 DCF = 620 / 1,503 = 0.41, for a discounted payback of 2.4 years.

   Using a financial calculator:
   Year 1: I = 10%; FV = 3,000; N = 1; PMT = 0; CPT → PV = –2,727
   Year 2: N = 2; FV = 2,000; CPT → PV = –1,653
   Year 3: N = 3; CPT → PV = –1,503
   [5,000 – (2,727 + 1,653) = 620]. 620 / 1,503 = 0.413, so discounted payback = 2 + 0.4 = 2.4.

8. C NPV = CF_0 + (discounted cash flows years 0 to 3 calculated in Question 7) = –5,000 + (2,727 + 1,653 + 1,503) = –5,000 + 5,833 = $883

9. D Intuition: You know the NPV is positive, so the IRR must be greater than 10%. You only have two choices, 15% and 20%. Pick one and solve the NPV; if it's not close to zero, you guessed wrong—pick the other one. Alternatively, you can solve directly for the IRR as CF_0 = –5,000, CF_1 = 3,000, CF_2 = 2,000, CF_3 = 2,000. IRR = 20.64%.

10. C PI = PV of future cash flows / CF_0 (discounted cash flows years 0 to 3 calculated in Question 7). PI = (2,727 + 1,653 + 1,503) / 5,000 = 1.177.

11. C The discounted payback period of 3.15 is calculated as follows:

$$CF_0 = -10{,}000;\ PVCF_1 = \frac{4{,}000}{1.12} = 3{,}571;\ PVCF_2 = \frac{4{,}000}{1.12^2} = 3{,}189;\ PVCF_3 = \frac{4{,}000}{1.12^3} = 2{,}847;$$

$$\text{and } PVCF_4 = \frac{4{,}000}{1.12^4} = 2{,}542.\ \text{CF after year 3} = -10{,}000 + 3{,}571 + 3{,}189 + 2{,}847 = -393$$

$$\frac{393}{\text{year 4 DCF}} = \frac{393}{2{,}542} = 0.15,\ \text{for a discounted payback period of 3.15 years.}$$

12. D Independent projects accept all with positive NPVs or IRRs greater than cost of capital. NPV computation is easy—treat cash flows as an annuity.

NPV_A: N = 5; I = 12; PMT = 5,000; FV = 0; CPT → PV = –18,024
NPV_A = 18,024 – 15,000 = $3,024
NPV_B: N = 4; I = 12; PMT = 7,500; FV = 0; CPT → PV = –22,780
NPV_B = 22,780 – 20,000 = $2,780

13. B Accept the project with the highest NPV.

14. A NPV profiles will intersect due to different sizes and lives.

15. A A post-audit identifies what went right and what went wrong. It is used to improve forecasting and operations.

16. C For the three year period, the average net income is (56,000 + 42,000 + 35,000) / 3 = $44,333. The initial book value is $270,000, declining by $90,000 per year until the final book value is $0. The average book value for this asset is ($270,000 – $0) / 2 = $135,000. The average accounting rate of return is ($44,333 / $135,000) = 0.328, or 32.8%.

17. D According to survey results, large companies, public companies, U.S. companies, and companies managed by a corporate manager with an advanced degree, are more likely to use discounted cash flow techniques like NPV to evaluate capital projects.

18. B The NPV of the new equipment is $700 million – $400 million = $300 million. The value of this project is added to Fullen's current market value. On a per-share basis, the addition is worth $300 million / 200 million shares, for a net addition to the share price of $1.50. $36.00 + $1.50 = $37.50.

The following is a review of the Corporate Finance principles designed to address the learning outcome statements set forth by CFA Institute®. This topic is also covered in:

COST OF CAPITAL

Study Session 11

EXAM FOCUS

The firm must decide how to raise the capital to fund its business or finance its growth, dividing it among common equity, debt, and preferred stock. The mix that produces the minimum overall cost of capital will maximize the value of the firm (share price). From this topic review, you must get an understanding of weighted average cost of capital and its calculation, and be ready to calculate the costs of retained earnings, new common stock, preferred stock, and the after-tax cost of debt. Don't worry about choosing among the methods for calculating the cost of retained earnings; the information given in the question will make it clear which one to use. This is very testable material and you must know all these formulas and understand why the marginal cost of capital increases as greater amounts of capital are raised over a given period (usually taken to be a year).

LOS 48.a: Determine and interpret the weighted average cost of capital (WACC) of a company, and explain the adjustments to it that an analyst should make in developing a cost of capital for a specific project.

LOS 48.b: Describe the role of taxes in the cost of capital from the different capital sources.

The capital budgeting process involves discounted cash flow analysis. To conduct such analysis, you must know the firm's proper discount rate. This topic review discusses how, as an analyst, you can determine the proper rate at which to discount the cash flows associated with a capital budgeting project. This discount rate is the firm's **weighted average cost of capital** (WACC) and is also referred to as the **marginal cost of capital** (MCC).

Basic definitions. On the right (liability) side of a firm's balance sheet, we have debt, preferred stock, and common equity. These are normally referred to as the *capital components* of the firm. Any increase in a firm's total assets will have to be financed through an increase in at least one of these capital accounts. The cost of each of these components is called the *component cost* of capital.

Throughout this review we focus on the following capital components and their component costs:

k_d The rate at which the firm can issue new debt. This is the yield to maturity on existing debt. This is also called the before-tax component cost of debt.

$k_d(1 - t)$ The after-tax cost of debt. Here, t is the firm's marginal tax rate. The after-tax component cost of debt, $k_d(1 - t)$, is used to calculate the WACC.

k_{ps} The cost of preferred stock.

k_{ce} The cost of common equity. It is the required rate of return on common stock and is generally difficult to estimate.

In many countries, the interest paid on corporate debt is tax deductible. Since we are interested in the after-tax cost of capital, we adjust the cost of debt, k_d, for the firm's marginal tax rate, t. Since there is typically no tax

deduction allowed for payments to common or preferred stockholders, there is no equivalent deduction to k_{ps} or k_{ce}.

How a company raises capital and how they budget or invest it are considered independently. Most companies have separate departments for the two tasks. The financing department is responsible for keeping costs low and using a balance of funding sources: common equity, preferred stock, and debt. Generally, it is necessary to raise each type of capital in large sums. The large sums may temporarily overweight the most recently issued capital, but in the long run, the firm will adhere to target weights. Because of these and other financing considerations, each investment decision must be made assuming a WACC which includes each of the different sources of capital and is based on the long-run target weights. A company creates value by producing a return on assets that is higher than the required rate return on the capital needed to fund those assets.

The WACC as we have described it is the cost of financing firm assets. We can view this cost as an opportunity cost. Consider how a company could reduce its costs if it found a way to produce its output using fewer assets, say less working capital. If we need less working capital, we can use the funds freed up to buy back our debt and equity securities in a mix that just matches our target capital structure. Our after-tax savings would be the WACC based on our target capital structure, times the total value of the securities that are no longer outstanding.

For these reasons, any time we are considering a project that requires expenditures, comparing the return on those expenditures to the WACC is the appropriate way to determine whether undertaking that project will increase the value of the firm. This is the essence of the capital budgeting decision. Since a firm's WACC reflects the average risk of the projects that make up the firm, it is not appropriate for evaluating all new projects. It should be adjusted upward for projects with greater-than-average risk and downward for projects with less-than-average risk.

The weights in the calculation of a firm's WACC are the proportions of each source of capital in a firm's capital structure.

Calculating a Company's Weighted-Average Cost of Capital

The WACC is given by:

$$WACC = (w_d)[k_d (1 - t)] + (w_{ps})(k_{ps}) + (w_{ce})(k_{ce})$$

where:
w_d = the percentage of debt in the capital structure
w_{ps} = the percentage of preferred stock in the capital structure
w_{ce} = the percentage of common stock in the capital structure

Example: Computing WACC

Suppose Dexter's target capital structure is as follows:

$w_d = 0.45$, $w_{ps} = 0.05$, and $w_{ce} = 0.50$

Its before-tax cost of debt is 8%, its cost of equity is 12%, its cost of preferred stock is 8.4%, and its marginal tax rate is 40%. Calculate Dexter's WACC.

Answer:

Dexter's WACC will be:
$WACC = (w_d)(k_d)(1 - t) + (w_{ps})(k_{ps}) + (w_{ce})(k_{ce})$
$WACC = (0.45)(0.08)(0.6) + (0.05)(0.084) + (0.50)(0.12) = 0.0858 \cong 8.6\%$

LOS 48.c: Describe alternative methods of calculating the weights used in the weighted average cost of capital, including the use of the company's target capital structure.

The weights in the calculation of WACC should be based on the firm's target capital structure, that is, the proportions (based on market values) of debt, preferred stock, and equity that the firm expects to achieve over time. In the absence of any explicit information about a firm's target capital structure from the firm itself, an analyst may simply use the firm's current capital structure (based on market values) as the best indication of its target capital structure. If there has been a noticeable trend in the firm's capital structure, the analyst may want to incorporate this trend into his estimate of the firm's target capital structure. For example, if a firm has been reducing its proportion of debt financing each year for two or three years, the analyst may wish to use a weight on debt that is lower than the firm's current weight on debt in constructing the firm's target capital structure.

Alternatively, an analyst may wish to use the industry average capital structure as the target capital structure for a firm under analysis.

Example: Determining target capital structure weights

The market values of a firm's capital are as follows:

- Debt outstanding: $8 million
- Preferred stock outstanding: $2 million
- Common stock outstanding: $10 million
- Total capital: $20 million

What is the firm's target capital structure based on its existing capital structure?

Answer:

debt 40%, $w_d = 0.40$

preferred stock 10%, $w_{ps} = 0.10$

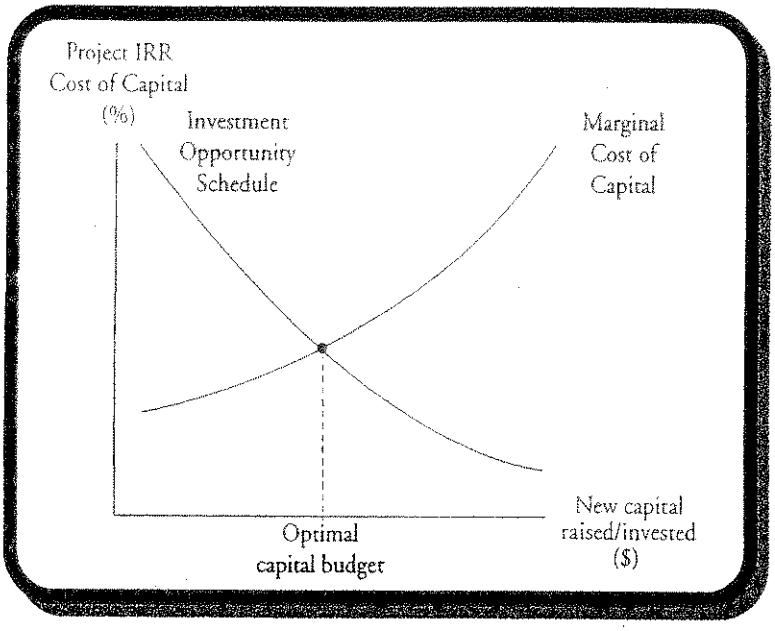
common stock 50%, $w_{ce} = 0.50$

For the industry average approach, we would simply use the arithmetic average of the current market weights (for each capital source) from a sample of industry firms.

LOS 48.d: Explain the analyst's concern with the marginal cost of capital in evaluating investment projects, and explain the use of the marginal cost of capital and the investment opportunity schedule in determining the optimal capital budget for a company.

A company increases its value and creates wealth for its shareholders by earning more on its investment in assets than is required by those who provide the capital for the firm. A firm's WACC may increase as larger amounts of capital are raised. Thus, its marginal cost of capital, the cost of raising additional capital, can increase as larger amounts are invested in new projects. This is illustrated by the upward sloping **marginal cost of capital curve** in Figure 1. Given the expected returns (IRRs) on potential projects, we can order the expenditures on additional projects from highest to lowest IRR. This will allow us to construct a downward slopinginvestment opportunity schedule such as that shown in Figure 1.

Figure 1: The Optimal Capital Budget



The intersection of the investment opportunity schedule with the marginal cost of capital curve identifies the amount of the optimal capital budget. The intuition here is that the firm should undertake all those projects with IRRs greater than the cost of funds, the same criterion developed in the capital budgeting topic review. This will maximize the value created. At the same time, no projects with IRRs less than the marginal cost of the additional capital required to fund them should be undertaken, as they will erode the value created by the firm.

LOS 48.e: Explain the marginal cost of capital's role in determining the net present value of a project.

One cautionary note regarding the simple logic behind Figure 1 is in order. All projects do not have the same risk. The WACC is the appropriate discount rate for projects that have approximately the same level of risk as the firm's existing projects. This is because the component costs of capital used to calculate the firm's WACC are based on the existing level of firm risk. To evaluate a project with greater than (the firm's) average risk, a discount rate greater than the firm's existing WACC should be used. Projects with below-average risk should be evaluated using a discount rate less than the firm's WACC.

An additional issue to consider when using a firm's WACC (marginal cost of capital) to evaluate a specific project is that there is an implicit assumption that the capital structure of the firm will remain at the target capital structure over the life of the project.

These complexities aside, we can still conclude that the NPVs of potential projects of firm-average risk should be calculated using the marginal cost of capital for the firm. Projects for which the present value of the after-tax cash inflows is greater than the present value of the after-tax cash outflows, should be undertaken by the firm.

LOS 48.f: Calculate and analyze the cost of fixed rate debt capital using the yield-to-maturity approach and the debt-rating approach.

The **after-tax cost of debt**, $k_d(1 - t)$, is used in computing the WACC. It is the interest rate at which firms can issue new debt (k_d) net of the tax savings from the tax-deductibility of interest, $k_d(t)$.

after-tax cost of debt = interest rate – tax savings = $k_d - k_d(t) = k_d(1 - t)$
after-tax cost of debt = $k_d(1 - t)$

Example: Cost of debt

Dexter, Inc., is planning to issue new debt at an interest rate of 8%. Dexter has a 40% marginal federal-plus-state tax rate. What is Dexter's cost of debt capital?

Answer:

$k_d (1 - t) = 8\% (1 - 0.4) = 4.8\%$

Professor's Note: It is important that you realize that the cost of debt is the market interest rate (YTM) on new (marginal) debt, not the coupon rate on the firm's existing debt. CFA Institute may provide you with both rates, and you need to select the current market rate.

If a market YTM is not available because the firm's debt is not publicly traded, the analyst may use the rating and maturity of the firm's existing debt to estimate the before-tax cost of debt. If, for example the firm's debt carries a single-A rating and has an average maturity of 15 years, the analyst can use the yield curve for single-A rated debt to determine the current market rate for debt with a 15-year maturity.

If any characteristics of the firm's anticipated debt would affect the yield (e.g. covenants or seniority), the analyst should make the appropriate adjustment to his estimated before-tax cost of debt. For firms that primarily employ floating-rate debt, the analyst should estimate the longer-term cost of the firm's debt using the current yield curve (term structure) for debt of the appropriate rating category.

LOS 48.g: Calculate the cost of noncallable, nonconvertible preferred stock.

The **cost of preferred stock** (k_{ps}) is:

$$k_{ps} = D_{ps} / P$$

where:
D_{ps} = preferred dividends
P = market price of preferred

Example: Cost of preferred stock

Suppose Dexter has preferred stock that pays an $8 dividend per share and sells for $100 per share. What is Dexter's cost of preferred stock?

Answer:

$k_{ps} = D_{ps} / P$
$k_{ps} = \$8 / \$100 = 0.08 = 8\%$

Note that the equation $k_{ps} = D_{ps} / P$ is just a rearrangement of the preferred stock valuation model $P = D_{ps} / k_{ps}$, where P is the market price.

LOS 48.h: Calculate and analyze the cost of equity capital using the capital asset pricing model approach, the dividend discount approach, and the bond yield plus risk premium approach.

The opportunity **cost of equity capital** (k_{ce}) is the required rate of return on the firm's common stock. The rationale here is that the firm could avoid part of the cost of common stock outstanding by using retained earnings to buy back shares of its own stock. The cost of (i.e., the required return) on common equity can be estimated using one of the following three approaches:

1. **The capital asset pricing model approach.**

   Step 1: Estimate the risk-free rate, RFR. The short-term Treasury bill (T-bill) rate is usually used, but some analysts feel the long-term Treasury rate should be used.

   Step 2: Estimate the stock's beta, β. This is the stock's risk measure.

   Step 3: Estimate the expected rate of return on the market $E(R_{mkt})$.

   Step 4: Use the capital asset pricing model (CAPM) equation to estimate the required rate of return:

   $$k_{ce} = RFR + \beta[E(R_m) - RFR]$$

   Example: Using CAPM to estimate k_{ce}

   Suppose RFR = 6%, R_{mkt} = 11%, and Dexter has a beta of 1.1.

   Answer:

   Then the required rate of return for Dexter's stock is:

   $$k_{ce} = 6\% + 1.1(11\% - 6\%) = 11.5\%$$

2. **The dividend discount model approach.** If dividends are expected to grow at a constant rate, g, then the current price of the stock is given by the dividend growth model:

   $$P_0 = \frac{D_1}{k_{ce} - g}$$

   where:
   D_1 = next year's dividend
   k_{ce} = the required rate of return on common equity
   g = the firm's expected constant growth rate

   Rearranging the terms, you can solve for k_{ce}:

   $$k_{ce} = \frac{D_1}{P_0} + g$$

   In order to use $k_{ce} = \frac{D_1}{P_0} + g$, you have to estimate the expected growth rate, g. This can be done by:

   - Using the growth rate as projected by security analysts.
   - Using the following equation to estimate a firm's sustainable growth rate:

     g = (retention rate)(return on equity) = (1 – payout rate)(ROE)

   The difficulty with this model is estimating the firm's future growth rate.

Example: Estimating k_{ce} using the dividend discount model

Suppose Dexter's stock sells for $21.00, next year's dividend is expected to be $1.00, Dexter's expected ROE is 12%, and Dexter is expected to pay out 40% of its earnings. What is Dexter's cost of equity?

Answer:

g = (ROE)(retention rate)
g = (0.12)(1 – 0.4) = 0.072 = 7.2%
k_{ce} = (1 / 21) + 0.072 = 0.12 or 12%

3. **Bond yield plus risk premium approach.** Analysts often use an ad hoc approach to estimate the required rate of return. They add a risk premium (3 to 5 percentage points) to the market yield on the firm's long-term debt.

k_{ce} = bond yield + risk premium

Example: Estimating k_{ce} with bond yields plus a risk premium

Dexter's interest rate on long-term debt is 8%. Suppose the risk premium is estimated to be 5%. Estimate Dexter's cost of equity.

Answer:

Dexter's estimated cost of equity is:

k_{ce} = 8% + 5% = 13%

Note that the three models gave us three different estimates of k_{ce}. The CAPM estimate was 11.5%, the dividend discount model estimate was 12%, and the bond yield plus risk premium estimate was 13%. Analysts must use their judgment to decide which is most appropriate.

KEY CONCEPTS

1. The WACC is given by WACC = $(w_d)(k_d)(1 - t) + (w_{ps})(k_{ps}) + (w_{ce})(k_{ce})$.
2. The pre-tax cost of debt must be reduced by the firm's tax rate to get an after-tax cost of debt capital.
3. Target weights can be simply the firm's current proportions of capital based on market values, current proportions adjusted for trends in the firm's capital structure, or based on average industry weights for capital sources.
4. The intersection of the investment opportunity schedule with the marginal cost of capital curve illustrates the optimal capital budget with which a firm can finance all positive NPV projects.
5. The marginal cost of capital (MCC) is the cost of additional capital.
6. The WACC for additional capital (the MCC) should be used as the discount rate when calculating project NPVs for capital budgeting decisions. Adjustments are appropriate for projects that differ in risk from the average risk of a firm's existing projects.
7. After-tax cost of debt = interest rate – tax savings = $k_d - k_d t = k_d(1 - t)$.
8. Cost of preferred stock = $k_{ps} = \frac{D_{ps}}{P}$.
9. Cost of retained earnings—three approaches:
   - Bond yield plus risk premium approach: k_{ce} = market yield on the firm's long-term debt + RP.
   - CAPM approach: $k_{ce} = RFR + \beta[E(R_{mkt}) - RFR]$.
   - Discounted cash flow approach: $k_{ce} = \frac{D_1}{P_0} + g$.

CONCEPT CHECKERS: THE COST OF CAPITAL

1. A company has $5 million in debt outstanding with a coupon rate of 12%. Currently the yield to maturity (YTM) on these bonds is 14%. If the firm's tax rate is 40%, what is the company's after-tax cost of debt?
   A. 8.4%.
   B. 5.6%.
   C. 12.0%.
   D. 14.0%.

2. The cost of preferred stock is equal to:
   A. the preferred stock dividend divided by its par value.
   B. the preferred stock dividend multiplied by the market price.
   C. [(1 – tax rate) times the preferred stock dividend] divided by price.
   D. the preferred stock dividend divided by the market price.

3. A company's $100, 8% preferred is currently selling for $85. What is the company's cost of preferred equity?
   A. 8.0%.
   B. 8.5%.
   C. 9.4%.
   D. 10.8%.

4. The expected dividend is $2.50 for a share of stock priced at $25. What is the cost of equity if the long-term growth in dividends is projected to be 8%?
   A. 15%.
   B. 16%.
   C. 18%.
   D. 19%.

5. An analyst gathered the following data about a company:

Capital Structure	Required Rate of Return
30% debt	10% for debt
20% preferred stock	11% for preferred stock
50% common stock	18% for common stock

   Assuming a 40% tax rate, what after-tax rate of return must the company earn on its investments?
   A. 10.0%.
   B. 13.0%.
   C. 14.2%.
   D. 18.0%.

6. A company is planning a $50 million expansion. The expansion is to be financed by selling $20 million in new debt and $30 million in new common stock. The before-tax required return on debt is 9% and 14% for equity. If the company is in the 40% tax bracket, what is the company's marginal cost of capital?
   A. 9.0%.
   B. 10.0%.
   C. 10.6%.
   D. 11.5%.

Use the following data to answer Questions 7 through 10.

- The company has a target capital structure of 40% debt and 60% equity.
- Bonds with face value of $1,000 pay a 10% coupon (semiannual), mature in 20 years, and sell for $849.54 with a yield to maturity of 12%.
- The company stock beta is 1.2.
- Risk-free rate is 10%, and market risk premium is 5%.
- The company is a constant-growth firm that just paid a dividend of $2.00, sells for $27.00 per share, and has a growth rate of 8%.
- The company's marginal tax rate is 40%.

7. The company's after-tax cost of debt is:
   A. 7.2%.
   B. 8.0%.
   C. 9.1%.
   D. 10.0%.

8. The company's cost of equity using the capital asset pricing model (CAPM) approach is:
   A. 13.6%.
   B. 16.0%.
   C. 16.6%.
   D. 16.9%.

9. The company's cost of equity using the dividend discount model is:
   A. 13.6%.
   B. 16.0%.
   C. 16.6%.
   D. 16.9%.

10. The company's weighted average cost of capital (using the cost of equity from CAPM) is:
    A. 12.5%.
    B. 13.0%.
    C. 13.5%.
    D. 14.0%.

11. What happens to a company's weighted average cost of capital (WACC) if the firm's corporate tax rate increases and if the Federal Reserve causes an increase in the risk-free rate, respectively? (Consider the events independently, and assume a beta of less than 1.) WACC will:

	Tax rate increase	Increase in risk-free rate
A.	Decrease	Increase
B.	Decrease	Decrease
C.	Increase	Increase
D.	Remain the same	Increase

12. Given the following information on a company's capital structure, what is the company's weighted average cost of capital? The marginal tax rate is 40%.

Type of capital	Percent of capital structure	Before-tax component cost
Bonds	40%	7.5%
Preferred stock	5%	11%
Common stock	55%	15%

A. 7.1%.
B. 10.0%.
C. 10.6%.
D. 13.3%.

ANSWERS – CONCEPT CHECKERS: THE COST OF CAPITAL

1. A $k_d(1 - t) = (0.14)(1 - 0.4) = 8.4\%$

2. D Cost of preferred stock = $k_{ps} = D_{ps} / P$

3. C $k_{ps} = D_{ps} / P_{ps}$, $D_{ps} = \$100 \times 8\% = \$8$, $k_{ps} = 8 / 85 = 9.4\%$

4. C Using the dividend yield plus growth rate approach: $k_{ce} = (D_1 / P_0) + g = (2.50 / 25.00) + 8\% = 18\%$.

5. B $WACC = (w_d)(k_d)(1 - t) + (w_{ps})(k_{ps}) + (w_{ce})(k_{ce}) = (0.3)(0.1)(1 - 0.4) + (0.2)(0.11) + (0.5)(0.18) = 13\%$

6. C $w_d = 20 / (20 + 30) = 0.4$, $w_{ce} = 30 / (20 + 30) = 0.6$

   $WACC = (w_d)(k_d)(1 - t) + (w_{ce})(k_{ce}) = (0.4)(9)(1 - 0.4) + (0.6)(14) = 10.56\% = MCC$

7. A $k_d(1 - t) = 12(1 - 0.4) = 7.2\%$

8. B Using the CAPM formula, $k_{ce} = RFR + [E(R_{mkt}) - RFR]Beta = 10 + (5)(1.2) = 16\%$.

9. B $D_1 = D_0 (1 + g) = 2(1.08) = 2.16$; $k_{ce} = (D_1 / P_0) + g = (2.16 / 27) + 0.08 = 16\%$

10. A $WACC = (w_d)(k_d)(1 - t) + (w_{ce})(k_{ce}) = (0.4)(7.2) + (0.6)(16) = 12.48\%$

11. A An increase in the corporate tax rate will reduce the after-tax cost of debt, causing the WACC to fall. More specifically, since the after-tax cost of debt = $(k_d)(1 - t)$, the term $(1 - t)$ decreases, decreasing the after-tax cost of debt. If the risk-free rate were to increase, the costs of debt and equity would both increase, thus causing the firm's cost of capital to increase.

12. C $WACC = (w_d)(k_d)(1 - t) + (w_{ps})(k_{ps}) + (w_{ce})(k_{ce}) = (0.4)(7.5)(1 - 0.4) + (0.05)(11) + (0.55)(15) = 10.6\%$

The following is a review of the Corporate Finance principles designed to address the learning outcome statements set forth by CFA Institute®. This topic is also covered in:

CAPITAL STRUCTURE AND LEVERAGE

Study Session 11

EXAM FOCUS

The focus of this topic review is how a firm's fixed operating costs and the proportion of debt in its capital structure affect its risk and expected earnings per share. You should be able to calculate and interpret the degree of operating leverage, degree of financial leverage, and degree of total leverage. You should also be able to discuss the impact of leverage on a firm's risk, return on equity, and share price.

LOS 49.a: Define and explain leverage, business risk, sales risk, operating risk, and financial risk.

Leverage, in the sense we use it here, refers to the amount of fixed costs a firm has. These fixed costs may be fixed operating expenses, such as building or equipment leases, or fixed financing costs, such as interest payments on debt. Greater leverage leads to greater variability of the firm's after-tax operating earnings and net income. A given change in sales will lead to a greater change in operating earnings when the firm employs operating leverage; a given change in operating earnings will lead to a greater change in net income when the firm employs financial leverage.

Professor's Note: The British refer to leverage as "gearing," which to me is actually more descriptive.

Business risk refers to the risk associated with a firm's operating income and is the result of uncertainty about a firm's revenues and the expenditures necessary to produce those revenues. Business risk is the combination of sales risk and operating risk.

- **Sales risk** is the uncertainty about the firm's sales.
- **Operating risk** refers to the additional uncertainty about operating earnings caused by fixed operating costs. The greater the proportion of fixed costs to variable costs, the greater a firm's operating risk.

Financial risk refers to the additional risk that the firm's common stockholders must bear when a firm uses fixed cost (debt) financing. When a company finances its operations with debt, it takes on fixed expenses in the form of interest payments. The greater the proportion of debt in a firm's capital structure, the greater the firm's financial risk.

LOS 49.b: Calculate and interpret the degree of operating leverage, the degree of financial leverage, and the degree of total leverage.

The **degree of operating leverage** (DOL) is defined as the percentage change in operating income (EBIT) that results from a given percentage change in sales:

$$DOL = \frac{\text{percentage change in EBIT}}{\text{percentage change in sales}} = \frac{\frac{\Delta EBIT}{EBIT}}{\frac{\Delta Q}{Q}}$$

To calculate a firm's DOL for a particular level of unit sales, Q, DOL is:

$$DOL = \frac{Q(P-V)}{Q(P-V)-F}$$

where:
Q = quantity of units sold
P = price per unit
V = variable cost per unit
F = fixed costs

Multiplying we have:

$$DOL = \frac{S-TVC}{S-TVC-F}$$

where:
S = sales
TVC = total variable costs
F = fixed costs

Note that in this form, the denominator is operating earnings (EBIT).

Example: Degree of operating leverage

Consider the costs for the projects presented in Figure 1. Assuming that 100,000 units are produced for each firm, calculate the DOL for Atom Company and Beta Company.

Figure 1: Operating Costs for Atom Company and Beta Company

	Atom Company	*Beta Company*
Price	$4.00	$4.00
Variable costs	$3.00	$2.00
Fixed costs	$40,000	$120,000
Revenue	$400,000	$400,000

Answer:

For Atom Company:

$$DOL(Atom) = \frac{Q(P-V)}{[Q(P-V)-F]} = \frac{100{,}000(4-3)}{[100{,}000(4-3)-40{,}000]}$$

$$DOL(Atom) = \frac{100{,}000}{60{,}000} = 1.67$$

For Beta Company:

$$\text{DOL(Beta)} = \frac{Q(P-V)}{\left[Q(P-V)-F\right]} = \frac{100{,}000(4-2)}{\left[100{,}000(4-2)-120{,}000\right]}$$

$$\text{DOL(Beta)} = \frac{200{,}000}{80{,}000} = 2.50$$

The results indicate that if Beta Company has a 10% increase in sales, its EBIT will increase by 2.50 × 10% = 25%, while for Atom Company, the increase in EBIT will be 1.67 × 10% = 16.7%.

It is important to note that the degree of operating leverage for a company depends on the level of sales. For example, if Atom Company sells 300,000 units, the DOL is decreased:

$$\text{DOL(Atom)} = \frac{Q(P-V)}{\left[Q(P-V)-F\right]} = \frac{300{,}000(4-3)}{\left[300{,}000(4-3)-40{,}000\right]} = \frac{300{,}000}{260{,}000} = 1.15$$

DOL is highest at low levels of sales and declines at higher levels of sales.

The **degree of financial leverage** (DFL) is interpreted as the ratio of the percentage change in net income (or EPS) to the percentage change in EBIT.

$$\text{DFL} = \frac{\text{percentage change in EPS}}{\text{percentage change in EBIT}}$$

For a particular level of operating earnings, DFL is calculated as:

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT} - \text{interest}}$$

Professor's Note: The terms "earnings per share" (EPS) and "net income" are used interchangeably in this topic review.

Example: Degree of financial leverage

From the previous example, Atom Company's operating income for selling 100,000 units is $60,000. Assume that Atom Company has annual interest expense of $18,000. If Atom's EBIT increases by 10%, by how much will its earnings per share increase?

Answer:

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT} - \text{I}} = \frac{\$60{,}000}{\$60{,}000 - \$18{,}000} = 1.43$$

$$\%\Delta\text{EPS} = \text{DFL} \times \%\Delta\text{EBIT} = 1.43 \times 10\% = 14.3\%$$

Hence, earnings per share will increase by 14.3%.

Professor's Note: Look back at the formulas for DOL and DFL and convince yourself that if there are no fixed costs, DOL is equal to one, and that if there are no interest costs, DFL is equal to one. Values of one mean no leverage. No fixed costs, no operating leverage. No interest costs, no financial leverage. This should help tie these formulas to the

concepts and help you know when you have the formulas right (or wrong). If you plug in zero for fixed costs, DOL should be one, and if you plug in zero for interest, DFL should be one.

The degree of total leverage (DTL) combines the degree of operating leverage and financial leverage. DTL measures the sensitivity of EPS to change in sales. DTL is computed as:

$$DTL = DOL \times DFL$$

$$DTL = \frac{\%\Delta EBIT}{\%\Delta sales} \times \frac{\%\Delta EPS}{\%\Delta EBIT} = \frac{\%\Delta EPS}{\%\Delta sales}$$

$$DTL = \frac{Q(P-V)}{Q(P-V)-F-I}$$

$$DTL = \frac{S-TVC}{S-TVC-F-I}$$

Example: Degree of total leverage

Continuing with our previous example, how much will Atom's EPS increase if Atom increases its sales by 10%?

Answer:

From the previous examples:

$DOL_{Atom} = 1.67$

$DFL_{Atom} = 1.43$

$DTL = DOL \times DFL = 1.67 \times 1.43 = 2.39$

Professor's Note: There is some rounding here. If we use 1.6666 for DOL and 1.42857 for DFL, we obtain the DTL of 2.38.

Note that we also could have calculated the DTL the long way. From the previous example, the current value of Atom's dollar sales is $4 \times 100,000 = \$400,000$.

$$DTL = \frac{S-TVC}{S-TVC-F-I} = \frac{\$400,000-\$300,000}{\$400,000-\$300,000-\$40,000-\$18,000} = 2.38$$

$\%\Delta EPS = DTL \times \%\Delta sales = 2.38 \times 10\% = 23.8\%$

EPS will increase by 23.8%.

LOS 49.c: Characterize the operating leverage, financial leverage, and total leverage of a company given a description of it.

Operating leverage is the result of a greater proportion of fixed costs compared to variable costs in a firm's capital structure. A firm with high operating leverage will have EBIT that is highly sensitive to changes in revenues and, as a result, has high operating risk. A given percentage change in sales leads to a greater percentage change in EBIT. However, higher operating risk also means a greater opportunity for reward as the firm can earn larger

profits as the number of units sold increases. A firm with low operating leverage will have EBIT that is less sensitive to the number of units sold.

Software and pharmaceutical companies (e.g., Microsoft, Pfizer) typically have high operating leverage. These firms typically spend a large amount producing and bringing a new product to market, which results in high fixed costs, but the variable costs to distribute the product are usually quite small. Retailers (e.g., Target, Wal-Mart) tend to have a variable cost structure, meaning their operating leverage is low.

Financial leverage refers to the use of fixed cost financing, such as debt or preferred stock. Financial leverage magnifies the variability of earnings per share compared to the variability of operating earnings (EBIT). Firms with a high degree of financial leverage will experience large changes in EPS for a given change in EBIT. A firm without debt financing (and a constant tax rate) will have equal changes in operating earnings and EPS (in the absence of non-operating income and losses).

Industrial firms that have higher percentage of tangible assets, such as land and equipment, tend to have higher amounts of financial leverage. Debt financing is relatively more attractive for these firms because the fixed assets provide a measure of security that the debt will be repaid. Technology and pharmaceutical companies, which tend to have fewer fixed assets, tend to use less debt and have less financial leverage.

Total leverage, the combination of operating and financial leverage, measures the sensitivity of EPS to changes in sales. If a firm has operating leverage of 3 and financial leverage of 2, its total leverage is 6. If a firm has high total leverage, a small change in sales will produce a large change in EPS. The key is that the combination of fixed operating costs and fixed financing costs magnifies the volatility of earnings for the owners of a business.

LOS 49.d: Calculate the breakeven quantity of sales and determine the company's net income at various sales levels.

The level of sales that a firm must generate to cover all of its fixed and variable costs is called the breakeven point. The **breakeven quantity of sales** is the quantity where sales revenues equal operating costs. The important point to understand here is that we can calculate breakeven quantity by simply determining how many units must be sold to just cover fixed costs.

For each unit sold, P – V (the difference between price and variable cost per unit) is available to help cover fixed costs. At F / (P – V) units, fixed costs are just covered, and the firm will break even.

$$Q_{BE} = \frac{\text{fixed costs}}{\text{price} - \text{variable cost per unit}}$$

Example: Breakeven quantity

Consider the prices and costs for Atom Company and Beta Company shown in Figure 2. Compute and illustrate the breakeven point for each company.

Figure 2: Operating Costs for Atom Company and Beta Company

	Atom Company	*Beta Company*
Price	$4.00	$4.00
Variable costs	$3.00	$2.00
Fixed costs	$40,000	$120,000

Answer:

For Atom Company, the breakeven quantity is:

$$Q_{BE}(\text{Atom}) = \frac{\$40{,}000}{\$4.00 - \$3.00} = 40{,}000 \text{ units}$$

Similarly for Beta Company, the breakeven quantity is:

$$Q_{BE}(\text{Beta}) = \frac{\$120{,}000}{\$4.00 - \$2.00} = 60{,}000 \text{ units}$$

The breakeven quantity and the relationship between sales revenue, total operating cost, operating profit, and operating loss are illustrated in Figures 3 and 4.

Figure 3: Breakeven Analysis for Atom Company

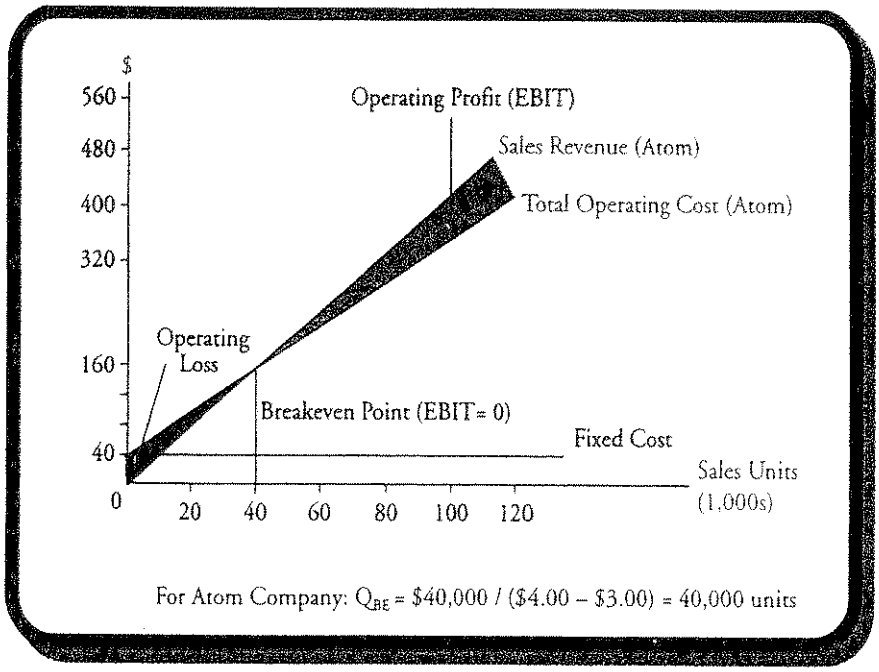
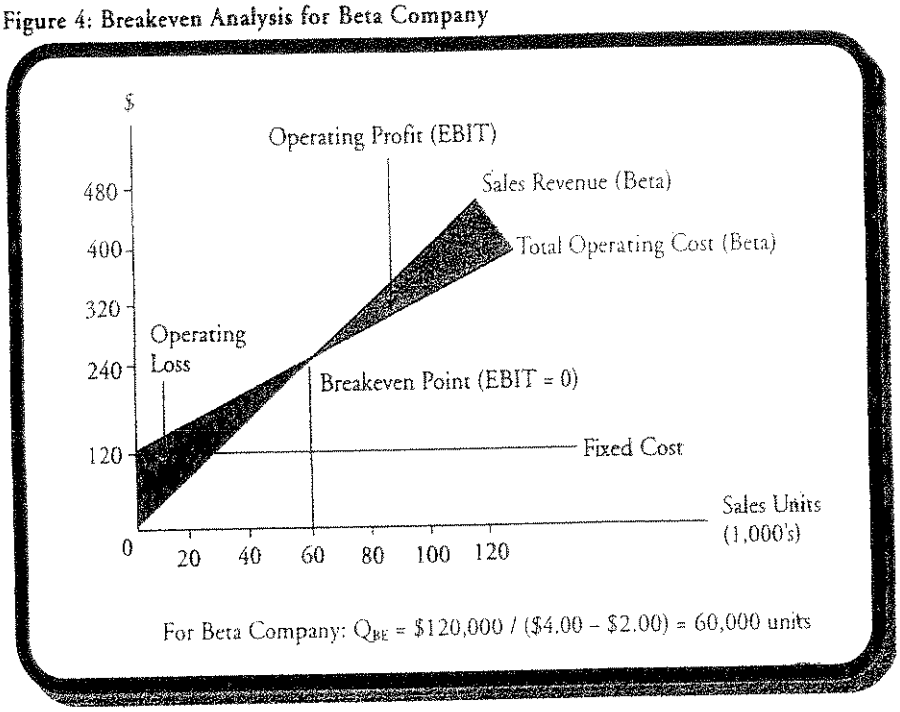


Figure 4: Breakeven Analysis for Beta Company



There may be different processes for manufacturing the same product, one that employs more variable costs (more labor) and one that involves greater fixed costs (a big automated machine). Beta company has chosen an operating structure with a greater proportion of fixed costs, and therefore, has more operating leverage. Beta Company's choice of greater operating leverage means that it has to generate more sales to cover its fixed costs and make a profit. However, once Beta generates enough sales to cover its fixed costs, the profit Beta generates beyond its breakeven point is greater than that of Atom. This reflects the greater risk and greater potential reward that Beta has as a result of its higher operating leverage.

LOS 49.e: Describe the effect of financial leverage on a company's net income and return on equity.

Earlier we defined financial leverage as the change in earnings per share (net income) for a given change in EBIT (operating income), and explained that the use of financial leverage significantly increases the risk and potential reward to common stockholders.

Let's look at a pair of examples involving Beta Company to quantify how financial leverage affects net income and shareholders' return on equity (ROE).

Example 1: Beta Company financed with 100% equity

Assume that the Beta Company has $500,000 in assets that are financed with 100% equity. Beta is expected to sell 100,000 units, resulting in operating income of [100,000 ($4 – $2)] – $120,000= $80,000. Calculate Beta's net income and return on equity if its EBIT increases or decreases by 10%. Beta's tax rate is 40%.

Answer:

Figure 5: Beta's Return on Equity with 100% Equity Financing

	EBIT Less 10%	*Expected EBIT*	*EBIT Plus 10%*
EBIT	$72,000	$80,000	$88,000
Interest expense	0	0	0
Income before taxes	$72,000	$80,000	$88,000
Taxes	28,800	32,000	35,200
Net income	**$43,200**	**$48,000**	**$52,800**
Shareholders' equity	$500,000	$500,000	$500,000
Return on equity (ROE)	**8.64%**	**9.60%**	**10.56%**

Example 2: Beta Company financed with 50% equity and 50% debt

Assume that Beta Company has $500,000 in assets that are financed with 50% equity and 50% debt. The interest rate on the debt is 6%. Beta is expected to sell 100,000 units, resulting in operating income of [100,000 ($4 – $2)] – $120,000 = $80,000. Calculate Beta's net income and return on equity if its EBIT increases or decreases by 10%. Beta's tax rate is 40%.

Answer:

Figure 6: Beta's Return on Equity with 50% Equity Financing

	EBIT Less 10%	*Expected EBIT*	*EBIT Plus 10%*
EBIT	$72,000	$80,000	$88,000
Interest expense (at 6%)	15,000	15,000	15,000
Income before taxes	$57,000	$65,000	$73,000
Taxes	22,800	26,000	29,200
Net income	**$34,200**	**$39,000**	**$43,800**
Shareholders' equity	$250,000	$250,000	$250,000
Return on equity (ROE)	**13.68%**	**15.60%**	**17.52%**

Comparing Figures 5 and 6, the interest expense associated with using debt represents a fixed cost that reduces net income. However, the lower net income value is spread over a smaller base of shareholders' equity, serving to magnify the ROE. In all three of the scenarios shown, ROE is higher using leverage than it is without leverage.

Further analyzing the differences between Figures 5 and 6, we can see that the use of financial leverage not only increases the *level* of ROE, it also increases the *rate of change* for ROE. In the unleveraged scenario, ROE varies directly with the change in EBIT. For an increase in EBIT of 10%, the ROE increases from 9.60% to 10.56%, for a rate of change of 10%. In the leveraged scenario, ROE is more volatile. For an increase in EBIT of 10%, the ROE increases from 15.60% to 17.52%, for a rate of change of 12.3%.

Bottom line: The use of financial leverage increases the risk of default, but also increases the potential return for equity holders.

Professor's Note: Note the relationship between this LOS and the DuPont formula used to analyze ROE. One of the components of the DuPont formula is the equity multiplier (assets/equity), which captures the effect of financial leverage on ROE.

LOS 49.f: Compare and contrast the risks of creditors and owners.

Creditors. In exchange for loaning money to a business, creditors receive interest and principal payments that must be made regardless of the business's profitability. If the business defaults on its debt payments, it can lead to bankruptcy. If bankruptcy occurs, creditors have a priority claim on the assets of the business, which gives them a higher level of safety compared to owners. Creditors have less risk than owners, but they also have less potential for return. Even if the business is extremely profitable, debt holders will not receive more than the interest and principal payments they have been promised.

Owners. The equity holders of a business have a claim to what is left over after all expenses, including scheduled principal and interest payments on debt, have been paid. In the event of bankruptcy, all creditors must be paid in full before equity holders are paid anything (strictly speaking). In many cases, the value of the equity stake in the business is reduced to zero as a result of bankruptcy. In exchange for this risk, equity holders make the business decisions, including the hiring or firing of managers and dividend payouts.

Professor's Note: Because decisions by equity owners can affect the risk of bondholders, bond covenants place restrictions on those actions of management that could significantly increase the risk of debt after the debt has been issued. This is covered in more detail in the study sessions on debt.

KEY CONCEPTS

1. Leverage increases the risk and potential return of a firm's earnings and cash flows.
2. Operating leverage results from fixed operating costs, while financial leverage results from the use of debt financing and its associated fixed costs.
3. Business risk is reflected in the variability of EBIT and results from a combination of sales risk and operating risk.
4. Financial risk is reflected in the greater variability of EPS compared to the variability of operating earnings (EBIT) as a result of using debt in the firm's capital structure.
5. The degree of operating leverage (DOL) is calculated as $\frac{Q(P-V)}{Q(P-V)-F}$ and is interpreted as $\frac{\%\Delta EBIT}{\%\Delta sales}$.
6. The degree of financial leverage (DFL) is calculated as $\frac{EBIT}{EBIT-I}$ and is interpreted as $\frac{\%\Delta EPS}{\%\Delta EBIT}$.
7. The degree of total leverage (DTL) is the combination of operating and financial leverage and is calculated as DOL × DFL and interpreted as $\frac{\%\Delta EPS}{\%\Delta sales}$.
8. The breakeven point is the number of units produced and sold where a company's fixed costs are just covered: $Q_{BE} = \frac{F}{P-V}$.
9. The use of debt in a company's capital structure reduces net income due to the added interest expense, but can increase equity owners' ROE.
10. A creditor of a firm has priority claim on the assets of the business in the event of bankruptcy, but the creditor's potential reward is limited to the promised interest and principal payments on the firm's debt.
11. A firm's owners have a residual claim on the firm's assets and earnings (they receive what is left after all expenses, including debt service, have been paid) and bear greater risk, but also have greater potential upside returns than creditors.

CONCEPT CHECKERS: CAPITAL STRUCTURE AND LEVERAGE

1. Business risk is the combination of:
   A. operating risk and financial risk.
   B. sales risk and financial risk.
   C. sales risk and liquidity risk.
   D. operating risk and sales risk.

2. Which of the following choices is a key determinant of operating leverage?
   A. The firm's beta.
   B. Level and cost of debt.
   C. The competitive nature of the business.
   D. The trade-off between fixed and variable costs.

3. Which of the following statements about capital structure and leverage is TRUE?
   A. Financial leverage is directly related to operating leverage.
   B. Increasing the corporate tax rate will not affect capital structure decisions.
   C. A firm with low operating leverage has a small proportion of its total costs in fixed costs.
   D. A firm with high business risk is more likely to increase its use of financial leverage than a firm with low business risk.

4. Jayco, Inc. sells blue ink for $4.00 a bottle. The ink's variable cost per bottle is $2.00. Ink has fixed cost of $10,000. What is Jayco's breakeven point, in units?
   A. 2,500.
   B. 5,000.
   C. 6,000.
   D. 7,500.

5. Jayco, Inc. has a division that makes red ink for the accounting industry. The unit has fixed costs of $10,000 per month and is expected to sell 40,000 bottles of ink per month. If the variable cost per bottle is $2.00, what price must the division charge in order to break even?
   A. $2.25.
   B. $2.50.
   C. $2.75.
   D. $3.25.

Use the following data to answer Questions 6 and 7.

If Jayco's sales increase by 10%, Jayco's EBIT increases by 15%. If Jayco's EBIT increases by 10%, Jayco's EPS increases by 12%.

6. Jayco's degree of operating leverage (DOL) and degree of financial leverage (DFL) are *closest* to:

	DOL	DFL
A.	1.8	1.2
B.	1.5	1.2
C.	1.8	1.4
D.	1.5	1.4

7. Jayco's degree of total leverage (DTL) is *closest* to:
   A. 1.2.
   B. 1.7.
   C. 1.8.
   D. 2.7.

Use the following data to answer Questions 8 and 9.

Jayco, Inc. sells 10,000 units at a price of $5 per unit. Jayco's fixed costs are $8,000, interest expense is $2,000, variable costs are $3 per unit, and EBIT is $12,000.

8. Jayco's degree of operating leverage (DOL) and degree of financial leverage (DFL) are *closest* to:

	DOL	DFL
A.	1.40	1.56
B.	1.40	1.20
C.	1.67	1.20
D.	1.67	1.56

9. Jayco's degree of total leverage (DTL) is *closest* to:
   A. 1.25.
   B. 1.50.
   C. 1.75.
   D. 2.00.

10. Vischer Concrete has $1.2 million in assets that are currently financed with 100% equity. Vischer's EBIT is $300,000 and its tax rate is 30%. If Vischer changes its capital structure (recapitalizes) to include 40% debt, what is Vischer's ROE before and after the change? Assume that the interest rate on debt is 5%.

	ROE at 100% equity	ROE at 60% equity
A.	17.5%	37.5%
B.	17.5%	26.8%
C.	25.0%	26.8%
D.	25.0%	37.5%

11. Which of the following statements regarding the risks and potential rewards for owners and creditors of a business is TRUE?
   A. The potential reward for creditors is virtually unlimited assuming the business is profitable.
   B. In the event of bankruptcy, creditors have a claim to the assets of the firm that must be met before equity owners receive anything.
   C. Owners have less risk than creditors.
   D. In exchange for the risk they bear, creditors have the authority to make decisions regarding how the business is run.

ANSWERS – CONCEPT CHECKERS: CAPITAL STRUCTURE AND LEVERAGE

1. D Business risk refers to the risk associated with a firm's operating income and is the result of uncertainty about a firm's revenues and the expenditures necessary to produce those revenues. Business risk is the combination of sales risk (the uncertainty associated with the price and quantity of goods and services sold) and operating risk (the leverage created by the use of fixed costs in the firm's operations).

2. D The extent to which costs are fixed determines operating leverage.

3. C Operating leverage is separate from financial leverage; increasing the tax rate would make the after-tax cost of debt cheaper; a firm that already has high operating risk will be less likely to take on more financial risk as the relationship is multiplicative.

4. B $Q_{BE} = \frac{F}{P-V} = \frac{10,000}{4-2} = 5,000$

5. A We can rearrange the formula $Q_{BE} = \frac{F}{P-V}$ as $P = \frac{F}{Q} + V$, or $P = \frac{10,000}{40,000} + 2 = \$2.25$

6. B $DOL = \frac{\text{increase in EBIT}}{\text{increase in sales}} = \frac{0.15}{0.10} = 1.5$; $DOL = \frac{\text{increase in EPS}}{\text{increase in EBIT}} = \frac{0.12}{0.10} = 1.2$

7. C $DTL = DOL \times DFL = 1.2 \times 1.5 = 1.8$

8. C $DOL = \frac{Q(P-V)}{[Q(P-V)-F]} = \frac{10,000(5-3)}{[10,000(5-3)-8,000]} = 1.67$

$DFL = \frac{EBIT}{EBIT-I} = \frac{12,000}{12,000-2,000} = 1.2$

9. D $DTL = \frac{Q(P-V)}{[Q(P-V)-F-I]} = \frac{10,000(5-3)}{[10,000(5-3)-8,000-2,000]} = 2$

or since we calculated the components in Question 8, $DTL = DOL \times DFL = 1.67 \times 1.2 = 2.0$

10. B With 100% equity:

EBIT	$300,000
Interest expense	0
Income before taxes	$300,000
Taxes at 30%	90,000
Net income	$210,000
Shareholder's equity	$1,200,000
ROE = NI/Equity	17.5%

With 60% equity:

EBIT	$300,000
Interest expense ($480,000 at 5%)	24,000
Income before taxes	$276,000
Taxes at 30%	82,800
Net income	$193,200
Shareholders' equity	$720,000
ROE = NI/Equity	26.8%

11. B In the event of bankruptcy, owners do not have a claim to corporate assets until creditors have been paid in full. Creditors have a less risky position since they are first in line to receive assets in the event of bankruptcy, but their potential reward is limited to the promised interest and principal payments on the debt.

The following is a review of the Corporate Finance principles designed to address the learning outcome statements set forth by CFA Institute®. This topic is also covered in:

DIVIDENDS AND DIVIDEND POLICY

Study Session 11

EXAM FOCUS

Besides the basics of dividend distribution and stock splits, the important topic here is share repurchases as an alternative to cash dividends. In recent years, firms have announced plans to repurchase record numbers of shares, making this an important and timely topic. Beyond this, make sure you can do the calculations indicated by the three LOS that begin with the word *calculate*. A basic understanding of the factors that affect a firm's payout policy, and of the signals investors may get from dividend changes, should be sufficient for any Level 1 questions.

LOS 50.a: Review cash dividends, stock dividends, stock splits, and reverse stock splits and calculate and discuss their impact on a shareholder.

Cash dividends, as the name implies, are payments made to shareholders in cash. They come in three forms:

- **Regular dividends** occur when a company pays out a portion of profits on a consistent schedule (e.g., quarterly). A long-term record of stable or increasing dividends is widely viewed by investors as a sign of a company's financial stability.
- **Special dividends** are used when the company does not have a regular dividend schedule or if favorable circumstances allow the firm to make a one-time cash payment to shareholders. Many cyclical firms (e.g., automakers) will use a special dividend to share profits with shareholders when times are good, but maintain the flexibility to conserve cash when profits are down. Other names for special dividends include "extra dividends" and "irregular dividends."
- **Liquidating dividends** occur when a company goes out of business and distributes the proceeds to shareholders. For tax purposes, a liquidating dividend is treated as a return of capital and amounts over the investor's tax basis are taxed as capital gains.

No matter which form cash dividends take, their net effect is to transfer cash from the company to its shareholders. The payment of a cash dividend reduces a company's assets and the market value of its equity. This means that immediately after a dividend is paid, the price of the stock should drop by the amount of the dividend. For example, if a company's stock price is $25 per share and the company pays $1 per share as a dividend, the price of the stock should immediately drop to $24 per share to account for the lower asset and equity values of the firm.

Stock dividends are dividends paid out in new shares of stock rather than cash. In this case, there will be more shares outstanding, but each one will be worth less. Stock dividends are commonly expressed as a percentage. A 20% stock dividend means every shareholder gets 20% more stock.

Example: Stock dividend

Dwight Craver owns 100 shares of Carson Construction Company at a current price of $30 per share. Carson has 1,000,000 shares of stock outstanding, and its earnings per share (EPS) for the last year were $1.50. Carson declares a 20% stock dividend to all shareholders of record as of June 30.

What is the effect of the stock dividend on the market price of the stock, and what is the impact of the dividend on Craver's ownership position in the company?

Answer:

Figure 1: Impact of 20% Stock Dividend on Shareholders

	Before Stock Dividend	*After Stock Dividend*
Shares outstanding	1,000,000	1,000,000 × 1.20 = 1,200,000
Earnings per share	$1.50	$1.50 / 1.20 = $1.25
Stock price	$30.00	$30.00 / 1.20 = $25.00
Total market value	1,000,000 × $30 = $30,000,000	1,200,000 × $25 = $30,000,000
Shares owned	100	100 × 1.20 = 120
Ownership value	100 × $30 = $3,000	120 × $25 = $3,000
Ownership stake	100 / 1,000,000 = 0.01%	120 / 1,200,000 = 0.01%

The effect of the stock dividend is to increase the number of shares outstanding by 20%. However, since company earnings stay the same, EPS decline and the price of the firm's stock drops from $30 to $25. Craver's receipt of more shares is exactly offset by the drop in stock price, and his wealth and ownership position in the company are unchanged.

Stock splits divide each existing share into multiple shares, thus creating more shares. There are now more shares, but the price of each share will drop correspondingly to the number of shares created, so there is no change in the owner's wealth. Splits are expressed as a ratio. In a 3-for-1 stock split, each old share is split into three new shares. Stock splits are more common today than stock dividends.

Example: Stock split

Carson Construction Company declares a 3-for-2 stock split. The current stock price is $30, earnings for last year were $1.50, dividends were $0.60 per share, and there are 1 million shares outstanding. What is the impact on Carson's shares outstanding, stock price, EPS, dividends per share, dividend yield, P/E, and market value?

Answer:

Figure 2: Impact of a 3-for-2 Stock Split on Shareholders

	Before Stock Split	*After Stock Split*
Shares outstanding	1,000,000	1,000,000 × (3/2) = 1,500,000
Stock price	$30.00	$30.00 / (3/2) = $20.00
Earnings per share	$1.50	$1.50 / (3/2) = $1.00
Dividends per share	$0.60	$0.60 / (3/2) = $0.40
Dividend yield	$0.60 / $30.00 = 2.0%	$0.40 / $20.00 = 2.0%
P/E ratio	$30.00 / $1.50 = 20	$20.00 / $1.00 = 20
Total market value	1,000,000 × $30 = $30,000,000	1,500,000 × $20 = $30,000,000

The number of shares outstanding increases, but the stock price, EPS, and dividends per share decrease by a proportional amount. The dividend yield, P/E ratio, and total market value of the firm remain the same.

The bottom line for stock splits and stock dividends is that they increase the total number of shares outstanding, but because the stock price and earnings per share are adjusted proportionally, a shareholder's total wealth is unchanged.

Some firms use stock splits and stock dividends to keep stock prices within a perceived optimal trading range of $20 to $80 per share. What does academic research have to say about this?

- Stock prices tend to rise after a split or stock dividend.
- Price increases appear to be because stock splits are taken as a positive signal from management about future earnings.
- If a report of good earnings does not follow a stock split, prices tend to revert to their original (split-adjusted) levels.
- Stock splits and dividends tend to reduce liquidity due to higher percentage brokerage fees on lower-priced stocks.

The conclusion is that stock splits and stock dividends just create more shares but don't increase shareholder value.

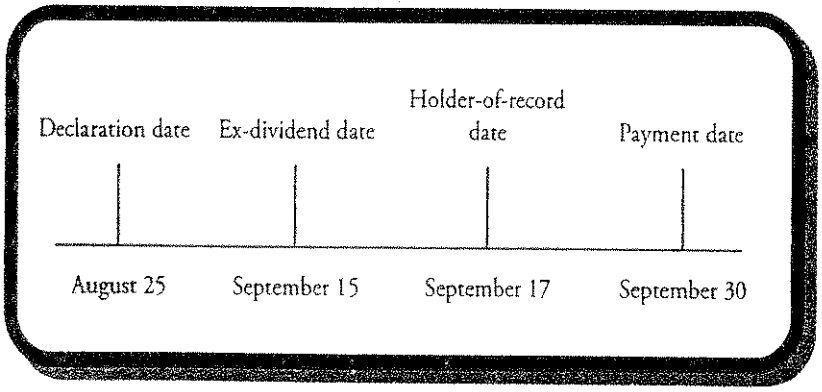
Reverse stock splits are the opposite of stock splits. After a reverse split there are fewer shares outstanding but higher stock prices. Since these factors offset one another, shareholder wealth is unchanged. The logic behind a reverse stock split is that the perceived optimal stock price range is $20 to $80 per share, and most investors consider a stock with a price less than $5 per share less than investment grade. A company in financial distress whose stock has fallen dramatically may declare a reverse stock split to increase the stock price.

LOS 50.f: Review dividend payment chronology including declaration, holder-of-record, ex-dividend, and payment dates and indicate when the share price will most likely reflect the dividend.

Professor's Note: This LOS has been taken out of order because some of the terms introduced here (e.g., ex-dividend) will be used in our discussion going forward.

An example of a typical dividend payment schedule is shown in Figure 3.

Figure 3: Dividend Payment Chronology



- **Declaration date.** The date the board of directors approves payment of the dividend.
- **Ex-dividend date.** The first day a share of stock trades without the dividend. The ex-dividend date is also the cut-off date for receiving the dividend and occurs two business days before the holder-of-record date. If you buy the share on or after the ex-dividend date, you will not receive the dividend.

- **Holder-of-record date.** The date on which the shareholders of record are designated to receive the dividend.
- **Payment date.** The date the dividend checks are mailed out, or when the payment is electronically transferred to shareholder accounts.

Stocks are traded ex-dividend on and after the ex-dividend date, so stock prices should fall by the amount of the dividend on the ex-dividend date. Because of taxes, however, the drop in price may be closer to the after-tax value of dividends.

Professor's Note: The reason that the holder-of-record date is two days after the ex-dividend date has to with the fact that the settlement date for stocks is three days after the trade date (t + 3). If an investor buys a stock the day before the ex-dividend date, the trade will settle three days later on the holder-of-record date, and the investor will receive the dividend.

LOS 50.b: Compare the impact on shareholder wealth of a share repurchase and a cash dividend of equal amount.

A **share repurchase** is a transaction in which a company buys back shares of its own common stock. Since shares are bought using a company's own cash, a share repurchase can be considered an alternative to a cash dividend.

Example: Impact of share repurchase and cash dividend of equal amounts

Spencer Pharmaceuticals Inc. (SPI) has 20,000,000 shares outstanding with a current market value of $50 per share. SPI made $100 million in profits for the recent quarter, and since only 70% of these profits will be reinvested back into the company, SPI's Board of Directors is considering two alternatives for distributing the remaining 30% to shareholders:

- Pay a cash dividend of $30,000,000 / 20,000,000 shares = $1.50 per share.
- Repurchase $30,000,000 worth of common stock.

Assume that dividends are received when the shares go ex-dividend, the stock can be repurchased at the market price of $50 per share, and there are no differences in tax treatment between the two alternatives. How would the wealth of an SPI shareholder be affected by the board's decision on the method of distribution?

Answer:

(1) Cash dividend

After the shares go ex-dividend, a shareholder of a single share would have $1.50 in cash and a share worth $50 – $1.50 = $48.50.

The ex-dividend value of $48.50 can also be calculated as the market value of equity after the distribution of the $30 million, divided by the number of shares outstanding after the dividend payment.

$$\frac{(20{,}000{,}000)(\$50)-\$30{,}000{,}000}{20{,}000{,}000}=\$48.50$$

Total wealth from the ownership of one share = $48.50 + $1.50 = $50

(2) Share repurchase

With $30,000,000, SPI could repurchase $30,000,000 / $50 = 600,000 shares of common stock. The share price after the repurchase is calculated as the market value of equity after the $30,000,000 repurchase divided by the shares outstanding after the repurchase:

$$\frac{(20{,}000{,}000)(\$50)-\$30{,}000{,}000}{20{,}000{,}000-600{,}000}=\frac{\$970{,}000{,}000}{19{,}400{,}000}=\$50$$

Total wealth from the ownership of one share = $50

Assuming the tax treatment of the two alternatives is the same, a share repurchase has the same impact on shareholder wealth as a cash dividend payment of an equal amount.

LOS 50.c: Calculate the earnings per share effect of a share repurchase when the repurchase is made with borrowed funds and the company's after-tax cost of debt is greater (less) than its earnings yield.

In our previous example, we assumed that the company used cash to repurchase its stock. What if the company borrows funds to buy back the stock?

Example: Share repurchase when the after-tax cost of debt is less than the earnings yield

Spencer Pharmaceuticals, Inc. (SPI) plans to borrow $30 million that it will use to repurchase shares. SPI's Chief Financial Officer has compiled the following information:

- Share price at the time of buyback = $50.
- Shares outstanding before buyback = 20,600,000.
- EPS before buyback = $5.00.
- Earnings yield = $5.00 / $50 = 10%.
- After-tax cost of borrowing = 8%.
- Planned buyback = 600,000 shares.

Calculate the EPS after the buyback.

Answer:

total earnings = $5.00 × 20,600,000 = $103,000,000

$$\text{EPS after buyback}=\frac{\text{total earnings}-\text{after-tax cost of funds}}{\text{shares outstanding after buyback}}$$

$$=\frac{\$103{,}000{,}000-(600{,}000\text{ shares}\times\$50\times0.08)}{(20{,}600{,}000-600{,}000)\text{ shares}}$$

$$=\frac{\$103{,}000{,}000-\$2{,}400{,}000}{20{,}000{,}000\text{ shares}}$$

$$=\frac{\$100{,}600{,}000}{20{,}000{,}000\text{ shares}}$$

$$=\$5.03$$

Since the after-tax cost of borrowing of 8% is less than the 10% earnings yield (E/P) of the shares, the share repurchase will increase the company's EPS.

Example: Share repurchase with borrowed funds where after-tax cost of debt exceeds the earnings yield

Spencer Pharmaceuticals, Inc. (SPI) plans to borrow $30 million that it will use to repurchase shares; however, creditors perceive the company to be a significant credit risk, and the after-tax cost of borrowing has jumped to 15%. Using the other information from the previous example, calculate the EPS after the buyback.

Answer:

$$\text{EPS after buyback} = \frac{\text{total earnings} - \text{after-tax cost of funds}}{\text{shares outstanding after buyback}}$$

$$= \frac{\$103{,}000{,}000 - (600{,}000 \text{ shares} \times \$50 \times 0.15)}{(20{,}600{,}000 - 600{,}000) \text{ shares}}$$

$$= \frac{\$103{,}000{,}000 - \$4{,}500{,}000}{20{,}000{,}000 \text{ shares}}$$

$$= \frac{\$98{,}500{,}000}{20{,}000{,}000 \text{ shares}}$$

$$= \$4.93$$

Since the after-tax cost of borrowing of 15% exceeds the earnings yield of 10%, the added interest paid reduces earnings, and the EPS after the buyback is less than the original $5.00.

The conclusion is that a share repurchase using borrowed funds will increase EPS if the after-tax cost of debt used to buy back shares is less than the earnings yield of the shares before the repurchase. It will decrease EPS if the cost of debt is greater than the earnings yield, and it will not change EPS if the two are equal.

LOS 50.d: Calculate the book value effect of a share repurchase when the market value of a share is greater (less) than book value per share.

Share repurchases may also have an impact on the book value of a share of stock.

Example: Effect of a share repurchase on book value per share

The share prices of Blue Inc. and Red Company are both $25 per share, and each company has 20 million shares outstanding. Both companies have announced a $10 million stock buyback. Blue Inc. has a book value of $300 million, while Red Company has a book value of $700 million.

Calculate the book value per share (BVPS) of each company after the share repurchase.

Answer:

Share buyback for both companies = $10 million / $25 per share = 400,000 shares.

Remaining shares for both companies = 20 million – 400,000 = 19.6 million.

Blue Inc.:

Blue Inc.'s current BVPS = $300 million / 20 million = $15.
The market price per share of $25 is greater than the BVPS of $15.

Book value after repurchase: $300 million – $10 million = $290 million
BVPS = $290 million / 19.6 million = $14.80
BVPS decreased by $0.20.

Red Company:

Red Company's current BVPS = $700 million / 20 million = $35.
The market price per share of $25 is less than the BVPS of $35.

Book value after repurchase: $700 million – $10 million = $690 million
BVPS = $690 million / 19.6 million = $35.20
BVPS increased by $0.20.

The conclusion is that BVPS will decrease if the share price is greater than the original BVPS and increase if the share price is less than the original BVPS.

LOS 50.e: Compare and contrast share repurchase methods.

Three repurchase methods:

1. **Buy in the open market.** Companies may repurchase stock in the open market at the prevailing market price. A share repurchase is authorized by the board of directors for a certain number of shares. Buying in the open market gives the company the flexibility to choose the timing of the transaction.

2. **Buy a fixed number of shares at a fixed price.** A company may repurchase stock by making a *tender offer* to repurchase a specific number of shares at a price that is usually at a premium to the current market price. Shareholders may tender their shares according to the terms of the offer. If shareholders try to tender more shares than the total repurchase, the company will typically buy back a pro rata amount from each shareholder.

3. **Repurchase by direct negotiation.** Companies may negotiate directly with a large shareholder to buy back a block of shares, usually at a premium to the market price. A company may engage in direct negotiation in order to keep a large block of shares from coming into the market and reducing the stock price, or to repurchase shares from a potential acquirer after an unsuccessful takeover attempt. If the firm pays more than market value for the shares, the result is an increase in wealth for the seller and an equal decrease in wealth for remaining firm shareholders.

LOS 50.g: Summarize the factors affecting dividend payout policy.

A company's dividend payout policy is the approach a company follows in determining the amount and timing of dividend payments to shareholders. Six primary factors affect a company's dividend payout policy:

Signaling effect. Unexpected changes in a company's dividend policy are often viewed by investors as a signal from management about projections of the firm's future performance. In other words, stockholders perceive changes in dividend policy as conveying important information about the firm.

Taxation of dividends. Investors are concerned about after-tax returns. Investment income is taxed by most countries; however, the ways that dividends are taxed vary widely from country to country. The method and amount of tax applied to a dividend payment can have a significant impact on a firm's dividend policy.

Clientele effect. This refers to the varying preferences for dividends of different groups of investors, such as individuals, institutions, and corporations. The dividend clientele effect states that different groups desire different levels of dividends. Rationales for the existence of the clientele effect include:

- *Tax considerations.* High-tax-bracket investors (like some individuals) prefer low dividend payouts, and low-tax-bracket investors (like corporations and pension funds) prefer high dividend payouts.
- *Requirements of institutional investors.* Some institutional investors will invest only in companies that pay a dividend or have a dividend yield above some target threshold. Examples are dividend-focused mutual funds and some trusts that are required hold dividend-paying stocks.
- *Individual investor preference.* Some investors prefer to buy stocks so they can spend the dividends while preserving the principal.

Restrictions on dividend payments. Companies may be restricted from paying dividends either by legal requirements or by implicit restrictions caused by cash needs of the business. Common restrictions on dividend payments include:

- *The impairment of capital rule.* A legal requirement in some countries mandates that dividends paid cannot be in excess of retained earnings.
- *Debt covenants.* These are designed to protect bondholders and dictate things a company must or must not do. Many covenants require a firm to meet or exceed a certain target for liquidity ratios (e.g., current ratio) and coverage ratios (e.g., interest coverage ratio) before they can pay a dividend.
- *Cash flow.* A company may pay a dividend in excess of earnings for a short period of time, but most companies will not pay a dividend in excess of their cash from operations (CFO) unless the company is going out of business.
- *Industry life cycle.* A firm early in its life will not typically pay a dividend because the firm would prefer to reinvest profits back into the company to facilitate growth.

Flotation costs on new issues vs. cost of retained earnings. When a company issues new shares of common stock, a *flotation cost* of 3% to 7% is taken from the amount of capital raised to pay for investment bankers and other costs associated with issuing the new stock. Since retained earnings have no such fee, the cost of new equity capital is always higher than the cost of retained earnings. A company that has a sufficient amount of positive net present value (NPV) projects would prefer to fund those projects using retained earnings rather than paying a dividend and issuing new shares. Note also that flotation costs make it unprofitable for a company to fund its dividend payments by issuing new shares of stock.

Shareholder preference for current income vs. capital gains. A lower tax rate for dividends compared to capital gains does not necessarily mean companies will raise their dividend payouts. Investors may not prefer a higher dividend, even if the tax rate on dividends is more favorable, for multiple reasons:

- Taxes on dividends are paid when the dividend is received, while capital gains taxes are paid only when shares are sold.
- The cost basis of shares may receive a step-up in valuation at the shareholder's death. This means that taxes on capital gains may not have to be paid at all.
- Tax-exempt institutions such as pension funds and endowments will be indifferent between dividends or capital gains.

LOS 50.h: Calculate the effective tax rate on a dollar of corporate earnings distributed as a dividend using the double-taxation, split-rate, and tax imputation systems.

Dividends paid in the United States are taxed according to what is called a **double-taxation** system. Earnings are taxed at the corporate level regardless of whether they are distributed as dividends, and dividends are taxed again at the shareholder level. In 2003, new tax legislation was passed in the U.S. that reduced the maximum tax rate on dividends at the individual shareholder level from 39.6% to 15%.

Since a dollar of earnings distributed as dividends is the first taxed at the corporate level, with the after-corporate-tax amount taxed at the individual level, we can calculate the total effective tax rate as:

corporate tax rate + (1 – corporate tax rate)(individual tax rate) = effective tax rate

Example: Effective tax rate under a double taxation system

A U.S. company's annual earnings are $300, and the corporate tax rate is 35%. Assume that the company pays out 100% of its earnings as dividends. Calculate the effective tax rate on a dollar of corporate earnings paid out as dividends under the 2003 U.S. tax laws.

Answer:

0.35 + (1 – 0.35)(0.15) = 0.4475 or 44.75%.

A **split-rate** corporate tax system taxes earnings distributed as dividends at a lower rate than retained earnings. The effect is to offset the higher tax rate applied to dividends at the individual level. Germany has a split-rate system. The calculation of the effective tax rate on a euro of corporate income distributed as dividends is based on the corporate tax rate for distributed income.

Example: Effective tax rate under a split-rate system

A German company's annual pretax earnings are €300. The corporate tax rate on retained earnings is 35%, and the corporate tax rate that applies to earnings paid out as dividends is 20%. Assuming that the company pays out 50% of its earnings as dividends and the individual tax rate that applies to dividends is 35%, calculate the effective tax rate on one euro of corporate earnings paid out as a dividend.

Answer:

effective tax rate on income distributed as dividends = 20% + [(1 – 20%) × 35%] = 48%

Under a split-rate tax system, shareholders in a low individual bracket would prefer a higher dividend payout since distributed income is taxed at a lower rate. However, shareholders in a high individual bracket would prefer a lower dividend payout since the tax rate on capital gains would be more favorable in their situation.

Under an **imputation tax system**, taxes are paid at the corporate level but are attributed to the shareholder, so that *all taxes are effectively paid at the shareholder rate.* Shareholders deduct their portion of the taxes paid by the corporation from their tax return. If the shareholder tax bracket is lower than the company rate, the shareholder would receive a tax credit equal to the difference between the two rates. If the shareholder tax bracket is higher than the company rate, the shareholder pays the difference between the two rates.

Example: Effective tax rate under an imputation system

Phil Cornelius and Ian Todd both own 100 shares of stock in a British corporation that makes £1.00 per share in net income. The corporation pays out all of its income as dividends. Cornelius is in the 20% individual tax bracket, while Todd is in the 40% individual tax bracket. The tax rate applicable to the corporation is 30%. Calculate the effective tax rate on the dividend for each shareholder.

Answer:

Figure 4: Effective Tax Rate Under an Imputation System

	Cornelius: 20% Rate	*Todd: 40% Rate*
Pretax income	£100	£100
Taxes at 30% corporate tax rate	£30	£30
Net income after tax	£70	£70
Dividend assuming 100% payout	£70	£70
Shareholder taxes	£20	£40
Less tax credit for corporate payment	£30	£30
Tax due from shareholder	(£10)	£10
Effective tax rate on dividend	20 / 100 = 20%	40 / 100 = 40%

Under an imputation system, the effective tax rate on the dividend is simply the shareholder's individual tax rate.

LOS 50.i: Discuss the types of information that dividend initiations, increases, decreases, and omissions may convey, and cross-country differences in the signalling content of dividends.

The information conveyed by **dividend initiation** is ambiguous. On one hand, a dividend initiation could mean that a company is sharing its wealth with shareholders—a positive signal. On the other hand, initiating a dividend could mean that a company has a lack of profitable reinvestment opportunities—a negative signal.

An **unexpected dividend increase** can signal to investors that a company's future business prospects are strong and that managers will share the success with shareholders. Studies have found that companies with a long history of dividend increases, such as GE and Exxon Mobil, are dominant in their industries and have high returns on assets and low debt ratios.

Unexpected dividend decreases or omissions are typically negative signals that the business is in trouble and that management does not think the current dividend payment can be maintained. In rare instances, however, management can attempt to send a positive signal by cutting the dividend. Management may believe profitable investment opportunities are available and that shareholders would ultimately receive a greater benefit by having earnings reinvested in the company rather than being paid out as dividends.

The information content in dividend policy changes is viewed differently across countries. In the United States, investors infer that even small changes in a dividend send a major signal about a company's prospects. However, in Japan and other Asian countries, investors are less likely to assume that even a large change in dividend policy signals anything about a company's future. As a result, Asian companies are freer to raise and lower their dividends as circumstances change without being concerned about how investor reactions may affect the stock price.

KEY CONCEPTS

1. Cash dividends are a payment from a company to a shareholder that reduces both the value of the company's assets and the market value of equity. They can come in the forms of regular, special, or liquidating dividends.
2. Stock dividends are new share distributions rather than cash dividends. Stock splits divide each existing share into multiple shares. Both create more shares, but there is a proportionate drop in the price per share, so there is no effect on shareholder wealth.
3. The chronology of a dividend payout is:
   - Declaration date.
   - Ex-dividend date.
   - Holder-of-record date.
   - Payment date.

   Stocks traded on or after the ex-dividend date will not receive the dividend.
4. A share repurchase is economically equivalent to a cash dividend of an equal amount, assuming the tax treatment of the two alternatives is the same.
5. The effect of share repurchases using borrowed funds on EPS is:
   - If the company's E/P is equal to the after-tax cost of borrowing, there will be no effect on EPS.
   - If the company's E/P is greater than (less than) the after-tax cost of borrowing, EPS will increase (decrease).
6. The effect of a share repurchase on BVPS is:
   - If the share price is greater than the original BVPS, the post-repurchase BVPS will decline.
   - If the share price is less than the original BVPS, the post-repurchase BVPS will increase.
7. Companies can repurchase shares of their own stock by buying shares in the open market, buying back a fixed number of shares at a fixed price through a tender offer, or directly negotiating to buy a large block of shares from a large shareholder.
8. Six main factors affect dividend payout policy:
   - Taxation of dividends.
   - Shareholder preference for current income vs. capital gains.
   - Flotation costs on new issues vs. cost of retained earnings.
   - Restrictions on dividend payments.
   - Clientele effect.
   - Signaling effect.
9. The effective tax rate on a dollar of corporate income distributed as dividends depends on the tax system.
   - Under a double-taxation or a split-tax rate system: effective rate = corporate rate + (1 – corporate rate)(individual rate). This helps offset the higher individual tax rate applied to dividends compared to capital gains.
   - Under a tax-imputation system, the effective tax rate on a dollar of income distributed as dividends is equal to the shareholder's rate.
10. Clientele effect refers to the varying preferences for dividends of different groups of investors, such as individuals, institutions, and corporations.
11. The signaling effect is based on the idea that dividends convey information about future earnings from management to investors. In general, unexpected increases are good news and unexpected decreases are bad news as seen by U.S. investors. In other countries such as Japan, changes in dividend policy do not have the same signaling impact.

CONCEPT CHECKERS: DIVIDENDS AND DIVIDEND POLICY

1. The Board of Directors of Sarkel Systems Corporation is considering approving an 8-for-5 stock split for the company's common stock. The company currently has 1.5 million shares outstanding, and EPS for the prior year were $0.60. The company intends to maintain a 50% payout ratio. The company's stock price is currently $40 per share. Sarkel's CFO provided a memo to the board to help them with their decision of whether to approve the dividend. The memo contained the following statements:
(1) The stock price after the split will be $25 per share.
(2) The company's dividend yield after the split will be 1.2%.
(3) After the split, the company's price-to-earnings ratio will remain 41.7× earnings.

Which of the following regarding statements in the memo is TRUE?

	Statement 1	Statement 2	Statement 3
A.	Incorrect	Incorrect	Correct
B.	Incorrect	Correct	Incorrect
C.	Correct	Incorrect	Incorrect
D.	Correct	Incorrect	Correct

2. Studdard Controls (STU) recently declared a quarterly dividend of $1.25 payable on Thursday, April 25 to holders of record on Friday, April 12. What is the last day an investor could purchase STU stock and still receive the quarterly dividend?
A. April 9.
B. April 10.
C. April 12.
D. April 25.

Use the following information to answer Questions 3 through 5.

Klaatu is a country that taxes dividends based on a double-taxation system. The corporate tax rate on company profits is 35%. Barada is a country that taxes dividends based on a split-rate tax system. The corporate tax rate applied to retained earnings is 36%, while the corporate tax rate applied to earnings paid out as dividends is 20%. Nikto is a country that taxes dividends based on an imputation tax system. The corporate tax rate on earnings is 38%.

3. An investor living in Klaatu holds 100 shares of stock in the Lucas Corporation. Lucas' pretax earnings for the current year are $2.00 per share, and the company has a payout ratio of 100%. The investor's individual tax rate on dividends is 30%. The effective tax rate on a dollar of funds to be paid out as dividends is *closest* to:
A. 35.0%.
B. 54.5%.
C. 62.3%.
D. 65.0%.

4. An investor living in Barada holds 100 shares of Prowse Inc. Prowse's pre-tax earnings in the current year are $1.00 per share, and Prowse pays dividends based on a target payout ratio of 40%. The individual tax rate that applies to dividends is 28%, and the individual tax rate that applies to capital gains is 15%. The effective tax rate on earnings distributed as dividends is:
A. 20.0%.
B. 38.8%.
C. 42.4%.
D. 53.9%.

5. Jenni White and Janet Langhals are each shareholders that live in Nikto, and each owns 100 shares of OCP Inc., which has €1.00 per share in net income. OCP pays out 100% of its earnings as dividends. White is in the 25% tax bracket, while Langhals is in the 42% tax bracket. The effective tax rate on earnings paid out as dividends is:
A. 53.5%.
B. 64.0%.
C. 53.5% for White and 64.0% for Langhals.
D. 25.0% for White and 42.0% for Langhals.

6. Nick Adams is recommending to the Board of Directors that they share the profits from an excellent year with shareholders by either declaring a special cash dividend of $20 million, or using the $20 million to repurchase shares of Volksberger common stock in the open market. Selected financial information about the firm is shown below.

Shares outstanding:	40 million
Current stock price:	$28.00
52-week trading range:	$20.00 to $36.00
Book value of equity:	$880 million
After-tax cost of borrowing:	5.5%

Adams drafts a memo to the Board of Directors detailing the financial impact of declaring a special cash dividend versus repurchasing shares. His memo includes two statements:
(1) The total shareholder wealth resulting from owning one share of stock with the special dividend option is $28.50, assuming the stock price doesn't change on the announcement of the special dividend.
(2) Our company's P/E ratio after the share buyback will remain 20 times earnings.

Which of the following regarding Adams' statements is TRUE?

	Statement 1	Statement 2
A.	Correct	Incorrect
B.	Incorrect	Correct
C.	Correct	Correct
D.	Incorrect	Incorrect

7. Which of the following would NOT be a good reason for a company to repurchase shares of its own stock? Management:
A. believes a stable cash dividend is in the best interests of shareholders.
B. believes its stock is overvalued.
C. wants to send a signal to investors that its outlook for the future is positive.
D. wants to increase the amount of leverage in its capital structure.

8. Arizona Seafood, Inc. plans $45 million in new borrowing to repurchase 3,600,000 shares at their market price of $12.50. The yield on the new debt will be 12%. The company has 36 million shares outstanding and EPS of $0.60 before the repurchase. The company's tax rate is 40%. The company's EPS after the share repurchase will be *closest* to:
A. $0.43.
B. $0.50.
C. $0.57.
D. $0.64.

9. Northern Financial Co. has a BVPS of $5.00. The company has announced a $15 million share buyback. The share price is $60 and the company has 40 million shares outstanding. After the share repurchase, the company's BVPS will be *closest* to:
   A. $4.65.
   B. $4.78.
   C. $4.90.
   D. $5.03.

10. Which of the following factors would encourage a company to maintain a high dividend payout ratio?
   A. The company is in the early stage of its life cycle.
   B. The double-taxation system is in place in the company's home country.
   C. Most of the shares in the company are held by income-oriented mutual funds.
   D. The company's debt covenants require an interest coverage ratio of at least 2.0x.

11. Two public companies, one based in the United States and one based in Japan, unexpectedly announce decreases in the regular quarterly dividends on their common shares. What is the *most likely* reaction of the two firms' share prices?

	Share price of U.S. firm	Share price of Japanese firm
A.	Decrease	Decrease
B.	Increase	No change
C.	No change	Decrease
D.	Decrease	No change

ANSWERS – CONCEPT CHECKERS: DIVIDEND POLICY

1. C A stock split will increase the number of shares outstanding, but since the price of the stock drops proportionally, there is no change in shareholder value. Statement 1 is correct. After the 8-for-5 stock split, the price of the stock will drop from its current level of $40 to (40 / (8/5)) = $25. Statement 2 is incorrect. The stock's current dividend yield is $0.30 / $40 = 0.75%. After the stock split, dividends per share will be $0.30 / (8/5) = $0.1875, and the dividend yield will remain $0.1875 / $25 = 0.75%. Statement 3 is incorrect. The P/E ratio will remain unchanged at $40 / $0.60 = 66.67×. After the split, EPS will be $0.60 / (8/5) = $0.375, and the P/E ratio will be $25 / $0.375 = 66.67×.

2. A If an investor purchases shares of stock on or after the ex-dividend date, she will NOT receive the dividend. Therefore, to receive the dividend, the investor must purchase stock the day before the ex-dividend date. The ex-dividend day is always two business days before the holder-of-record date. Two days before April 12 is April 10; therefore, the last day the investor can purchase shares and still receive the dividend is April 9.

3. B The effective tax rate on earnings distributed as dividends is 0.35 + (1 – 0.35)(0.30) = 0.545 = 54.5%.

4. C The effective tax rate on earnings distributed as dividends is 0.20 + (1 – 0.20)(0.28) = 0.424 = 42.4%.

5. D Under an imputation tax system, the effective tax rate on earnings distributed as dividends is the tax rate of the shareholder receiving the dividends.

6. B Adams is incorrect with respect to Statement 1. If the firm pays its special dividend of $20 million, both the assets and equity of the firm will drop by $20 million. The total wealth from owning one share will be [(40 million)($28) – $20 million] / 40 million = $27.50, plus $20 million / 40 million = $0.50 per share as a dividend, so the total shareholder wealth resulting from owning one share of stock is $28. Note that the total shareholder wealth of $28 is the same whether the cash dividend or share repurchase option is chosen. Adams is correct with respect to Statement 2. The current EPS is $56 million / 40 million = $1.40, so the current P/E ratio is $28 / $1.40 = 20 times earnings. A share buyback will result in fewer shares but a lower equity value, so the price per share will remain the same. Since the price is the same, and earnings are the same, the P/E ratio will remain 20 times earnings after the repurchase.

7. B Management would repurchase shares of its own stock if it believed the shares were undervalued, not overvalued.

8. C Total earnings are $0.60 × 36,000,000 = $21,600,000.

After-tax cost of debt is 12% × (1 – 0.40) = 7.2%.

$$\text{EPS after buyback} = \frac{\text{total earnings} - \text{after-tax cost of funds}}{\text{shares outstanding after buyback}}$$

$$= \frac{\$21{,}600{,}000 - (3{,}600{,}000 \text{ shares} \times \$12.50 \times 0.072)}{36{,}000{,}000 \text{ shares} - 3{,}600{,}000 \text{ shares}}$$

$$= \frac{\$21{,}600{,}000 - \$3{,}240{,}000}{32{,}400{,}000 \text{ shares}} = \frac{\$18{,}360{,}000}{32{,}400{,}000 \text{ shares}}$$

EPS = $0.57

9. A Shares to be repurchased are $15 million / $60 = 250,000 shares.
Remaining shares after the repurchase will be 40,000,000 – 250,000 = 39,750,000 shares.
Book value before the repurchase is 40,000,000 × $5.00 = $200,000,000.
Book value after the repurchase will be $200,000,000 – $15,000,000 = $185,000,000.
BVPS = $185,000,000 / 39,750,000 = $4.654 per share.

10. C Institutional investors such as income-oriented mutual funds would invest in companies that pay a high dividend. The clientele effect suggests a company should maintain its current dividend payout policy. A company in the early stage of its life cycle typically does not pay a dividend. Double taxation of dividends and debt covenants both encourage low dividend payout ratios.

11. D Unexpected dividend decreases or omissions are typically seen by U.S. investors as a signal that the business is in trouble and management does not believe it can maintain the current dividend. In Japan and other Asian countries, investors are less likely to assume a change in dividend policy signals anything about a company's prospects.

The following is a review of the Corporate Finance principles designed to address the learning outcome statements set forth by CFA Institute®. This topic is also covered in:

The Corporate Governance of Listed Companies: A Manual for Investors

Study Session 11

Exam Focus

Due to the collapses of some major corporations and associated investor losses, corporate governance has become a hot topic in the investment community. The prominence of the issue has likely been a factor in the decision to include this topic in the curriculum. Corporate governance encompasses the internal controls that outline how a firm is managed. The material here is not particularly challenging. You need to understand well the specific issues that are covered under the heading of "corporate governance" and which practices are considered good. You should know the characteristics of an independent and effective board of directors. Much of the rest of the material has to do with shareholder interests and whether a firm's actions and procedures promote the interests of shareholders.

LOS 51.a: Define corporate governance.

Corporate governance is the set of internal controls, processes, and procedures by which firms are managed. It defines the appropriate rights, roles, and responsibilities of management, the board of directors, and shareholders within an organization. It is the firm's checks and balances. Good corporate governance practices seek to ensure that:

- The board of directors protects shareholder interests.
- The firm acts lawfully and ethically in dealings with shareholders.
- The rights of shareholders are protected and shareholders have a voice in governance.
- The board acts independently from management.
- Proper procedures and controls cover management's day-to-day operations.
- The firm's financial, operating, and governance activities are reported to shareholders in a fair, accurate, and timely manner.

LOS 51.b: Discuss and critique characteristics and practices related to board and committee independence, experience, compensation, external consultants and frequency of elections and determine whether they are supportive of shareowner protection.

To properly protect their long-term interests as shareholders, investors should consider whether:

- A majority of the board of directors is comprised of independent members (not management).
- The board meets regularly outside the presence of management.
- The chairman of the board is also the CEO or a former CEO of the firm. This may impair the ability and willingness of independent board members to express opinions contrary to those of management.
- Independent board members have a primary or leading board member in cases where the chairman is *not* independent.
- Board members are closely aligned with a firm supplier, customer, share-option plan or pension adviser. Can board members recuse themselves on any potential areas of conflict?

A non-independent board is more likely to make decisions that unfairly or improperly benefit management and those who have influence over management. These also may harm shareholders' long-term interests.

There is often a need for specific, specialized, independent advice on various firm issues and risks, including compensation, mergers and acquisitions, legal, regulatory, and financial matters, and issues relating to the firm's reputation. A truly independent board will have the ability to hire external consultants without management approval. This enables the board to receive specialized advice on technical issues and provides the board with independent advice that is not influenced by management interests.

Frequency of Board Elections

Anything beyond a two- or three-year limit on board member tenure limits shareowners' ability to change the board's composition if board members fail to represent shareowners' interests fairly.

While reviewing firm policy regarding election of the board, investors should consider:

- Whether there are annual elections or staggered multiple-year terms (a classified board). A classified board may serve another purpose—to act as a takeover defense.
- Whether the board filled a vacant position for a remaining term without shareholder approval.
- Whether shareholders can remove a board member.
- Whether the board is the proper size for the specific facts and circumstances of the firm.

LOS 51.c: Define board independence and explain the importance of independent board members in corporate governance.

A board can be considered independent if its decisions are not controlled or biased by the management of the firm. To be independent, a board member must not have any material relationship with:

- The firm and its subsidiaries, including former employees, executives, and their families.
- Individuals or groups, such as a shareholder(s) with a controlling interest, which can influence the firm's management.
- Executive management and their families.
- The firm's advisers, auditors, and their families.
- Any entity which has a cross directorship with the firm.

An independent board member must work to protect shareholders' long-term interests. Board members need to have not only independence, but experience and resources. The board of directors must have autonomy to operate independently from management.

If board members are not independent, they may be more likely to make decisions that benefit either management or those who have influence over management, thus harming shareholders' long-term interests.

To make sure board members act independently, the firm should have policies in place to discourage board members from receiving consulting fees for work done on the firm's behalf or receiving finders' fees for bringing mergers, acquisitions, and sales to management's attention. Further, procedures should limit board members' and associates' ability to receive compensation beyond the scope of their board responsibilities.

The firm should disclose all material related party transactions or commercial relationships it has with board members or nominees. The same goes for any property that is leased, loaned, or otherwise provided to the firm by board members or executive officers. Receiving personal benefits from the firm can create conflicts of interest.

LOS 51.d: Identify factors that indicate a board and its members possess the experience required to govern the company for the benefit of its shareowners.

Board members without the requisite skills and experience are more likely to defer to management when making decisions. This can be a threat to shareholder interests.

When evaluating the qualifications of board members, consider whether board members:

- Can make informed decisions about the firm's future.
- Can act with care and competence as a result of their experience with:
  - Technologies, products, services which the firm offers.
  - Financial operations and accounting and auditing topics.
  - Legal issues.
  - Strategies and planning.
  - Business risks the firm faces.
- Have made any public statements indicating their ethical stances.
- Have had any legal or regulatory problems as a result of working for or serving on the firm's board or the board of another firm.
- Have other board experience.
- Regularly attend meetings.
- Are committed to shareholders. Do they have significant stock positions? Have they eliminated any conflicts of interest?
- Have necessary experience and qualifications.
- Have served on board for more than ten years. While this adds experience, these board members may be too closely allied with management.

Investors should also consider how many board and committee meetings are held, and the attendance record of the meetings; whether the board and its committees conduct self-assessments; and whether the board provides adequate training for its members.

LOS 51.e: Explain the provisions that should be included in a strong corporate code of ethics and the implications of a weak code of ethics with regard to related-party transactions and personal use of company assets.

A code of ethics for a firm sets the standard for basic principles of integrity, trust, and honesty. It gives the staff behavioral standards and addresses conflicts of interest. Ethical breaches can lead to big problems for firms, resulting in sanctions, fines, management turnover, and unwanted negative publicity. Having an ethical code can be a mitigating factor with regulators if a breach occurs.

When analyzing ethics codes, these are items to be considered:

- Make sure the board of directors receives relevant corporate information in a timely manner.
- Ethics codes should be in compliance with the corporate governance laws of the location country and with the governance requirements set forth by the local stock exchange. Firms should disclose whether they adhered to their own ethical code, including any reasons for failure.
- The ethical code should prohibit advantages to the firm's insiders that are not offered to shareowners.
- A person should be designated to be responsible for corporate governance.
- If selected management personnel receive waivers from the ethics code, reasons should be given.
- If any provisions of the ethics code were waived recently, the firm should explain why.
- The firm's ethics code should be audited and improved periodically.

In evaluating management, investors should:

- Verify that the firm has committed to an ethical framework and adopted a code of ethics.
- See if the firm permits board members or management to use firm assets for personal reasons.
- Analyze executive compensation to assess whether it is commensurate with responsibilities and performance.
- Look into the size, purpose, means of financing, and duration of any share-repurchase programs.

LOS 51.f: State the key areas of responsibility for which board committees are typically created and explain the criteria for assessing whether each committee is able to adequately represent shareowner interests.

Audit Committee

This committee ensures that the financial information provided to shareholders is complete, accurate, reliable, relevant, and timely. Investors must determine whether:

- Proper accounting and auditing procedures have been followed.
- The external auditor is free from management influence.
- Any conflicts between the external auditor and the firm are resolved in a manner that favors the shareholder.
- Independent auditors have authority over the audit of all the company's affiliates and divisions.
- All board members serving on the audit committee are independent.
- Committee members are financial experts.
- The shareholders vote on the approval of the board's selection of the external auditor.
- The audit committee has authority to approve or reject any proposed non-audit engagements with the external audit firm.
- The firm has provisions and procedures that specify to whom the internal auditor reports. Internal auditors must have no restrictions on their contact with the audit committee.
- There have been any discussions between the audit committee and the external auditor resulting in a change in financial reports due to questionable interpretation of accounting rules, fraud, etc.
- The audit committee controls the audit budget.

Remuneration/Compensation Committee

Investors should be sure a committee of independent board members sets executive compensation, commensurate with responsibilities and performance. The committee can further these goals by making sure all committee members are independent, and by linking compensation to long-term firm performance and profitability.

Investors, when analyzing this committee, should determine whether:

- Executive compensation is appropriate.
- The firm has provided loans or the use of company property to board members.
- Committee members attend regularly.
- Policies and procedures for this committee are in place.
- The firm has provided details to shareholders regarding compensation in public documents.
- Terms and conditions of options granted are reasonable.
- Any obligations regarding share-based compensation are met through issuance of new shares.
- The firm and the board are required to receive shareholder approval for any share-based remuneration plans, since these plans can create potential dilution issues.
- Senior executives from other firms have cross-directorship links with the firm or committee members. Watch for situations where individuals may benefit directly from reciprocal decisions on board compensation.

Nominations Committee

The nominations committee handles recruiting of new (independent) board members. It is responsible for:

- Recruiting qualified board members.
- Regularly reviewing performance, independence, skills, and experience of existing board members.
- Creating nomination procedures and policies.
- Preparing an executive management succession plan.

Candidates proposed by this committee will affect whether or not the board works for the benefit of shareholders. Performance assessment of board members should be fair and appropriate. Investors should review company reports over several years to see if this committee has properly recruited board members who have fairly protected shareholder interests. Investors should also review:

- Criteria for selecting new board members.
- Composition, background, and expertise of present board members. How do proposed new members complement the existing board?
- The process for finding new members (i.e., input from outside the firm versus management suggestions).
- Attendance records.
- Succession plans for executive management (if such plans exist).
- The committee's report, including any actions, decisions, and discussion.

Other Board Committees

Additional committees can provide more insight into goals and strategies of the firm. These committees are more likely to fall outside typical corporate governance codes, so they are more likely to be comprised of members of executive management. Be wary of this—independence is once again critical to maintain shareowners' best interests.

LOS 51.g: Evaluate, from a shareowner's perspective, company policies related to voting rules, shareowner sponsored proposals, common stock classes and takeover defenses.

The ability to vote proxies is a fundamental shareholder right. If the firm makes it difficult to vote proxies, it limits the ability of shareholders to express their views and affect the firm's future direction.

Investors should consider whether the firm:

- Limits the ability to vote shares by requiring attendance at annual meeting.
- Groups its meetings to be held the same day as other companies in the same region and also requires attendance to cast votes.
- Allows proxy voting by some remote mechanism.
- Is allowed under its governance code to use **share blocking**, a mechanism that prevents investors who wish to vote their shares from trading their shares during a period prior to the annual meeting.

Confidential Voting

Investors should determine if shareholders are able to cast confidential votes. This can encourage unbiased voting. In looking at this issue, investors should consider whether:

- The firm uses a third party to tabulate votes.
- The third party or the firm retains voting records.
- The tabulation is subject to audit.
- Shareholders are entitled to vote only if present.

Cumulative Voting

Shareholders may be able to cast the cumulative number of votes allotted to their shares for one or a limited number of board nominees. Be cautious in the event the firm has a considerable minority shareholder group, such as a founding family, that can serve its own interests through cumulative voting.

Information on possible cumulative voting rights will be contained in the articles of organization and by-laws, the prospectus, or Form 8-A, which must be filed with the Securities and Exchange Commission in the United States.

Voting for Other Corporate Changes

Changes to corporate structure or policies can change the relationship between shareholders and the firm. Watch for changes to:

- Articles of organization.
- By-laws.
- Governance structures.
- Voting rights and procedures.
- Poison pill provisions (these are impediments to an acquisition of the firm).
- Provisions for change-in-control.

Regarding issues requiring shareholder approval, consider whether shareholders:

- Must approve corporate change proposals with supermajority votes.
- Will be able to vote on the sale of the firm, or part of it, to a third-party buyer.
- Will be able to vote on major executive compensation issues.
- Will be able to approve any anti-takeover measures.
- Will be able to periodically reconsider and re-vote on rules that require supermajority voting to revise any governance documents.
- Have the ability to vote for changes in articles of organization, by-laws, governance structures, and voting rights and procedures.
- Have the ability to use their relatively small ownership interest to force a vote on a special interest issue.

Investors should also be able to review issues such as:

- Share buy-back programs that may be used to fund share-based compensation grants.
- Amendments or other changes to a firm's charter and by-laws.
- Issuance of new capital stock.

Shareowner-Sponsored Board Nominations

Investors need to determine whether the firm's shareholders have the power to put forth an independent board nominee. Having such flexibility is positive for investors as it allows them to address their concerns and protect their interests through direct board representation. Additional items to consider:

- Under what circumstances can a shareholder nominate a board member?
- Can shareowners vote to remove a board member?
- How does the firm handle contested board elections?

The proxy statement is a good source document for information about these issues in the United States. In many jurisdictions, articles of organization and corporate by-laws are other good sources of information on shareholder rights.

Shareowner-Sponsored Resolutions

The right to propose initiatives for consideration at the annual meeting is an important shareholder method to send a message to management.

Investors should look at whether:

- The firm requires a simple majority or a supermajority vote to pass a resolution.
- Shareholders can hold a special meeting to vote on a special initiative.
- Shareholder-proposed initiatives will benefit all shareholders, rather than just a small group.

Advisory or Binding Shareowner Proposals

Investors should find out if the board and management are required to actually implement any shareholder-approved proposals. Investors should determine whether:

- The firm has implemented or ignored such proposals in the past.
- The firm requires a supermajority of votes to approve changes to its by-laws and articles of organization.
- Any regulatory agencies have pressured firms to act on the terms of any approved shareholder initiatives.

Different Classes of Common Equity

Different classes of common equity within a firm may separate the voting rights of those shares from their economic value.

Firms with dual classes of common equity could encourage prospective acquirers to only deal directly with shareholders with the supermajority rights. Firms that separate voting rights from economic rights have historically had more trouble raising equity capital for fixed investment and product development than firms that combine those rights.

When looking at a firm's ownership structure, examine whether:

- Safeguards in the by-laws and articles of organization protect shareholders who have inferior voting rights.
- The firm was recently privatized by a government entity and the selling entity retained voting rights. This may prevent shareholders from receiving full value for their shares.
- Any super-voting rights kept by certain classes of shareholders impair the firm's ability to raise equity capital. If a firm has to turn to debt financing, the increase in leverage can harm the firm.

Information on these issues can be found in the proxy, web site, prospectus, or notes to the financial statements.

Shareowner Legal Rights

Examine whether the investor has the legal right under the corporate governance code and other legal statutes of the jurisdiction in which the firm is headquartered to seek legal redress or regulatory action to enforce and protect shareholder rights.

Investors should determine whether:

- Legal statutes allow shareholders to take legal actions to enforce ownership rights.
- The local market regulator, in similar situations, has taken action to enforce shareholder rights.
- Shareholders are allowed to take legal or regulatory action against the firm's management or board in the case of fraud.
- Shareholders have "dissenters' rights," which require the firm to repurchase their shares at fair market value in the event of a problem.

Takeover Defenses

Examples of takeover defenses include golden parachutes, poison pills, and greenmail (use of corporate funds to buy back the shares of a hostile acquirer at a premium to their market value). All of these defenses may be used to counter a hostile bid, and their probable effect is to decrease share value.

When reviewing the firm's takeover defenses, investors should:

- Ask whether the firm requires shareholder approval to implement such takeover measures.
- Ask whether the firm has received any acquisition interest in the past.

- Consider that the firm may use its cash to "pay off" a hostile bidder. Shareholders should take steps to discourage this activity.
- Consider whether any change of control issues would invoke the interest of a national or local government and, as a result, pressure the seller to change the terms of the acquisition or merger.

KEY CONCEPTS

1. Corporate governance is the set of internal controls, processes, and procedures by which firms are managed.
2. A non-independent board of directors is more likely to make decisions in the interests of management rather than shareholders. Investors should consider whether the board has a majority of independent members, meets outside management's presence, and is free from conflicts of interest.
3. A board can be considered independent if its decisions are not controlled or biased by the management of the firm. An independent board member must work to protect the long-term interests of shareholders.
4. Board members should have the skills and experience required to make informed decisions about the firm's future.
5. A firm's code of ethics sets the standard for basic principles of integrity, trust, and honesty. Having a code of ethics can be a mitigating factor with regulators if a breach occurs.
6. The audit, compensation, and nominations committees execute the key responsibilities of the board.
7. Company policies can make it difficult to vote proxies. Minority shareholder groups can serve their own interests through cumulative voting. Corporate structure changes can alter the relationship between shareholders and the firm. Different classes of equity may separate the voting rights of shares from their economic value.

CONCEPT CHECKERS: THE CORPORATE GOVERNANCE OF LISTED COMPANIES: A MANUAL FOR INVESTORS

1. Which of the following board characteristics would *least likely* be an indication of high quality corporate governance?
   A. Board members have staggered terms.
   B. The board can hire independent consultants.
   C. The board has a separate committee to set executive pay.
   D. Several members who are not involved with the day-to-day operations of the company.

2. Which of the following board members would *most likely* be considered to be well chosen based on the principles of good corporate governance?
   A. A board member of Company B who is also the CEO of Company B.
   B. A board member of Company B who is an ex-employee of Company B.
   C. A board member of Company B who is a partner in an accounting firm that competes with the firm's auditor.
   D. A board member of Company A who is president of Company B, when the CFO of company A sits on Company B's board.

3. Which of the following is likely to be the *least important* in enabling a corporate board to exercise its duty by acting in the long-term interest of shareholders?
   A. The board meets regularly outside the presence of management.
   B. A majority of the board members are independent of firm management.
   C. The board has representatives from key suppliers and important customers.
   D. When the board chairman is the CEO, there is a leading independent board member.

4. Which of the following would *most likely* be considered a negative factor in assessing the suitability of a board member? The board member:
   A. has served for ten years.
   B. has served on other boards.
   C. owns stock in the company.
   D. is a former CEO of another firm.

5. Which of the following would *least likely* be an indication of poor corporate governance?
   A. A board member leases office space in a building he owns to the company.
   B. There are board members who do not have previous experience in the industry the firm operates in.
   C. A board member has a consulting contract with the firm to provide strategic vision for the technology research and development effort.
   D. Board members can receive a finder's fee for bringing attractive acquisition targets to management and the board if they are subsequently acquired.

6. Which of the following would *most likely* be considered a poor corporate practice in terms of promoting shareholder interests?
   A. The firm can use "share blocking."
   B. The firm allows voting by some remote mechanism.
   C. The firm uses a third party to tabulate shareholder votes.
   D. Voting for board members does not allow cumulative voting by shareholders of all votes allotted to their shares.

7. Two analysts are discussing shareholder defenses against hostile takeovers. Alice states, "It is positive for shareholders that the board has shown a willingness to buy back shares from holders who may be in a position to effect a hostile takeover of the firm at less than its long-term value to shareholders." Bradley states, "Firms that are likely takeover targets should offer valuable exit packages in the event of a hostile takeover because they are necessary to recruit highly talented top executives, such as the CEO." From the perspective of good corporate governance, should you agree or disagree with each of these statements?

	Alice	Bradley
A.	Agree	Agree
B.	Agree	Disagree
C.	Disagree	Agree
D.	Disagree	Disagree

ANSWERS – CONCEPT CHECKERS: THE CORPORATE GOVERNANCE OF LISTED COMPANIES: A MANUAL FOR INVESTORS

1. A Staggered terms make it more difficult for shareholders to change the board of directors. Annual elections of all members make the board more responsive to shareholder wishes.

2. C A board member who is a partner in an unrelated accounting firm would be considered independent, has no particular relation to firm management, and could be a valuable addition to the board.

3. C Board members should not be closely aligned with a firm's suppliers or customers since they may act in the interest of suppliers and customers rather than in the interest of shareholders.

4. A While experience may be a good thing, a board member with long tenure may be too closely aligned with management to be considered an independent member.

5. B Lack of previous experience in the firm's industry is not necessarily a negative and can be consistent with an independent board member who acts in shareholders' long-term interests. Examples might be board members with specialized knowledge of finance, marketing, management, accounting, or auditing. The other answers all indicate possible conflicts of interest.

6. A Share blocking prevents shareholders from trading their shares over a period prior to the annual meeting and is considered a restriction on the ability of shareholders to express their opinions and act in their own interests. Cumulative voting can allow a minority group, such as a founding family, to serve its own interests. The other answers are considered good corporate governance practices.

7. D Defenses against hostile takeovers such as greenmail (Alice) or golden parachutes (Bradley) tend to protect entrenched or poorly performing managements and typically decrease share values. Shareholders as a group always have the choice not to sell when a takeover offer is not in their long-term interests.

The following is a review of the Portfolio Management principles designed to address the learning outcome statements set forth by CFA Institute®. This topic is also covered in:

THE ASSET ALLOCATION DECISION

Study Session 12

EXAM FOCUS

There is nothing difficult here, but the material is important because it is likely to be tested and it is the foundation for the portfolio construction material at Level 2 and especially Level 3. You should be ready to explain the what and why of an investment policy statement and know the objectives (risk and return) and the constraints: liquidity, legal, time horizon, tax treatment, and unique circumstances. Know the four common return objectives, why the objectives part of the investment policy statement should include risk objectives, and (in broad strokes) the factors that influence risk tolerance.

LOS 52.a: Describe the steps in the portfolio management process and explain the reasons for a policy statement.

There are four general steps in the **portfolio management process**:

1. *Write a policy statement* that specifies the investor's goals and constraints and itemize the risks the investor is willing to take to meet these goals.
2. *Develop an investment strategy* designed to satisfy the investor's policy statement based on an analysis of the current financial and economic conditions.
3. *Implement the plan* by constructing the portfolio and allocating the investor's assets across countries, asset classes, and securities based on current and future forecasts of economic conditions.
4. *Monitor and update* the investor's needs and market conditions. Rebalance the investor's portfolio as needed. Rebalancing refers to shifting assets when the account allocations to different asset classes deviate significantly from the strategic asset allocation specified.

The **policy statement** is the framework that provides structure to the investment process. It forces investors to understand their own needs and constraints and to articulate them within the construct of realistic goals. The policy statement helps investors understand the risks and costs of investing and guides the actions of the portfolio manager. In essence, the purpose of the policy statement is to impose investment discipline on the client and the portfolio manager.

Performance cannot be judged without an objective standard. The policy statement should state the standards by which the portfolio's performance will be judged and specify the benchmark that represents the investor's risk preferences. The portfolio performance should be measured relative to the stated benchmark and not simply by the portfolio's raw returns.

LOS 52.b: Explain why investment objectives should be expressed in terms of both risk and return and list the factors that may affect an investor's risk tolerance.

Investment objectives must be stated in terms of both risk and return.

Return objectives may be stated in absolute terms (dollar amounts) or percentages. Return considerations also cover capital preservation, capital appreciation, current income needs, and total returns.