Principles of Finance  
Exam 3  
Helpful Hints

The exam will include multiple choice questions and problems. If you have worked and understand the end-of-chapter problems that were assigned, you should be able to work the problems on the exam. Please take a look at the review sheet that is posted on the course webpage. Following is some additional information that might help you when studying.

- **Chapter 9—Capital Budgeting Techniques**
  - All of the capital budgeting techniques that employ the time value of money (TVM) must provide the same accept/reject decision. In other words, if one TVM technique indicates that a project is acceptable, then the others must also indicate that the project is acceptable. Thus, if we know that a project has a net present value (NPV) greater than zero—that is, NPV > 0—then we know the following must also be true:
    - The project’s internal rate of return (IRR) must be greater than the firm’s required rate of return.
    - The project’s discounted payback period (DPB) must be less than its useful life.
    - The project’s modified internal rate of return (MIRR) must be greater than the firm’s required rate of return.
  - If multiple independent projects are being evaluated, it doesn’t matter which TVM capital budgeting technique is used to determine whether the projects are acceptable, because the firm should invest in all acceptable projects regardless of how acceptable they are.
  - If multiple mutually exclusive projects are being evaluated, the firm should invest in the acceptable project that increases the value of the firm the greatest. To ensure the correct decision is made, the NPV technique should be used in this case.

- **Chapter 10—Project Cash Flows and Risk**
  - In capital budgeting analysis, to be considered relevant—that is, a relevant cash flow—a cash flow must change if the firm purchases the project.
  - Depreciation is not a cash flow. However, depreciation affects cash flows because it is an expense that affects the amount of taxes the firm pays. Everything else equal, greater depreciation results in lower taxes paid by the firm. For example, if a project increases the firm’s depreciation by $10,000 and the firm has a marginal tax rate equal to 40 percent, the firm would pay $4,000 less in taxes. The following shows that this is correct:

<table>
<thead>
<tr>
<th></th>
<th>Without Depreciation</th>
<th>With Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating income before depreciation</td>
<td>$25,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>Depreciation</td>
<td>(0)</td>
<td>(10,000)</td>
</tr>
<tr>
<td>Operating income</td>
<td>$25,000</td>
<td>$15,000</td>
</tr>
<tr>
<td>Taxes on operating income (40%)</td>
<td>(10,000)</td>
<td>(6,000)</td>
</tr>
<tr>
<td>Difference in taxes</td>
<td>$6,000 – $10,000 = -$4,000, which means the firm pays $4,000 less in taxes.</td>
<td></td>
</tr>
</tbody>
</table>

  - If a firm evaluates projects that have significantly different risk than the assets it currently has, the projects should be evaluated using a required rate of return that is different than the firm’s average, or normal, required rate of return. The rate of return that should be used to evaluate projects with higher-than-normal risk should be higher than the firm’s average required rate of return; the rate of return that should be used to evaluate projects with lower-than-normal risk should be lower than the firm’s average required rate of return; the rate of return that should be used to evaluate projects with normal (average) risk should be equal to the firm’s average required rate of return.

- **Chapter 11—The cost of Capital**
  - The costs of the various sources of capital that the firm uses—debt and equity—represent the rates of return that investors require to provide the funds to the firm. For example, the yield to maturity (YTM) on a firm’s bond represents the rate of return investors demand (require) to purchase the bonds; the YTM is the firm’s before tax cost of debt, rd.
  - rd is adjusted for taxes to produce r_{after} because interest on debt is tax-deductible. None of the costs of the other sources of capital is adjusted for taxes, because none of the payouts of those sources is tax-deductible.
  - The weighted average cost of capital (WACC) is the average of the individual capital component costs based on the proportion of the source that makes up the firms combined capital structure; for example,
if the firm’s balance sheet shows that its assets are financed with 50 percent common equity, then 50 percent of its WACC consists of the cost of common equity.

- The firm’s WACC is the same as the firm’s required rate of return, r. In other words, WACC = r.
- There are many WACCs for one firm. The firm’s WACC is not known until that amount of its capital budget for the year is known. In other words, the WACC might be 10 percent if the firm plans to invest $5 million, it might be 12 percent if the same firm plans to invest $12 million, and so forth. The more funds the firm needs to raise, the higher its WACC for those funds will be.

**Chapter 17—Financial Planning and Control**

- Pro forma financial statements are forecasted financial statements.
- A firm must forecast its future financial needs so that it can make arrangements to raise needed funds prior to the time they are needed; pro formas show how much funds are generated spontaneously (internally) through normal operations and the retention of earnings and how much funds must be raised externally by issuing stocks and bonds. The funds that must be raised externally by issuing stocks and bonds are called additional funds needed, or AFN, because they are the funds that the firm needs in addition to the internally generated funds to support forecasted operations.

- Break even points represent the level of operations where specific items on the income statement are equal to zero:
  - Operating break even point is where operating income, which is called either the net operating income (NOI) or earnings before interest and taxes (EBIT), is equal to zero; it is where the firm’s sales revenues equal its operating expenses.
  - Financial break even point is where earnings per share (EPS) equal zero; it is where the firm’s EBIT just covers its fixed financial expenses, which are interest on debt and preferred dividends.
  - A firm can operate at both its operating break even point and financial break even point at the same time (simultaneously) only if it has no fixed financial costs; otherwise, if a firm that has debt operates at its operating break even point, its net income will be negative (less than zero); following is an example of the bottom portion of an income statement for a firm with outstanding debt that operates at its operating breakeven point:

<table>
<thead>
<tr>
<th>EBIT</th>
<th>$ 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>(10,000)</td>
</tr>
<tr>
<td>Earnings before taxes</td>
<td>(10,000)</td>
</tr>
<tr>
<td>Taxes (40%)</td>
<td>4,000</td>
</tr>
<tr>
<td>= tax refund</td>
<td></td>
</tr>
<tr>
<td>Net income</td>
<td>($ 6,000)</td>
</tr>
</tbody>
</table>

- Leverage exists when the firm has fixed costs, whether those fixed costs are operating costs, financial costs, or both.
  - Operating leverage exists when the firm has fixed operating costs
    - The degree of operating leverage (DOL) shows by what percent EBIT (operating income) will differ from the forecasted amount if sales differ by 1 percent
    - Example: Suppose a firm has a DOL = 2.0. If its sales turn out to be 10 percent lower than forecasted, its EBIT will be 20 percent (= 10% x 2.0) lower than expected.
  - Financial leverage exists when the firm has fixed financing costs, such as interest, preferred dividends, or both of these costs.
    - The degree of financial leverage (DFL) shows by what percent EPS (earnings per share) will differ from the forecasted amount if EBIT differs by 1 percent
    - Example: Suppose a firm has a DFL = 3.0. If its EBIT turns out to be 20 percent lower than forecasted, its EPS will be 60 percent (= 20% x 3.0) lower than expected.
  - Total (combined) leverage exists when the firm has fixed costs, regardless of whether those costs are operating, financial, or both.
    - The degree of total leverage (DTL) shows by what percent EPS will differ from the forecasted amount if sales differ by 1 percent
    - Example: Suppose a firm has a DTL = 6.0. If its sales turn out to be 10 percent lower than forecasted, its EPS will be 60 percent (= 10% x 6.0) lower than expected.
    - DTL = DOL x DFL = 2.0 x 3.0 = 6.0 in the example; if DTL > 1.0, the firm has leverage; if DTL > 1.0, the firm could have operating leverage only, financial leverage only, or both operating leverage and financial leverage.