



# Principles of Finance

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## Assignment 6

### Instructions

- Assignments should be done in groups of 2 to 3 students.
- You should remain with the same group through the entire course.
- Submit on Moodle only one copy of solutions per group.
- For each assignment you can get a maximum of 100 points.
- All assignments turned in late will not be graded (zero points).

### Due date

The due date is indicated on Moodle.

1. You are deciding between two mutually exclusive investment opportunities. Both require the same initial investment of \$10 million. Investment A will generate \$2 million per year (starting at the end of the first year) in perpetuity. Investment B will generate \$1.5 million at the end of the first year and its revenue will grow at 2% per year for every year after that. (15 points)
  - (a) Which investment has the higher IRR?
  - (b) Which investment has the higher NPV when the cost of capital is 7%?
  - (c) Which investment will you decide to undertake? Why?
2. You expect DM Corporation to generate the following free cash flows over the next five years:

Year	1	2	3	4	5
FCF (\$ millions)	75	84	96	111	120

Beginning with year six, you estimate that DM's free cash flows will grow at 6% per year and that DM's weighted average cost of capital is 15%. (10 points)

(a) What is the enterprise value for DM Corporation?

(b) If DM has \$500 million of debt and 14 million shares of stock outstanding, then what is the price per share of DM Corporation?

3. Halliford corporation expects to have earnings this coming year of \$3 per share. Halliford plans to retain all of its earnings for the next two years. For the subsequent two years, the firm will retain 50% of its earnings. It will then retain 20% of its earnings from that point onward. Each year, retained earnings will be invested in new projects with an expected return of 25% per year. Any earnings that are not retained will be paid out as dividends. Assume Halliford's share count remains constant and all earnings growth comes from the investment of retained earnings. If Halliford's equity cost of capital is 10%, what price would you estimate for Halliford's stock? (15 points)

4. You are the investment banker of a large technology group. In late 2013, on behalf of your client, you initiate discussions with ABC Technologies, a privately held developer of advanced security systems, about the possibility of acquiring their business at the end of 2013. Given the information below, how much would you advise your client to pay per share of ABC Technologies if you use a discounted FCF approach: (15 points)

- Debt : \$30 million
- Excess cash : \$110 million
- Shares outstanding : 50 million
- Expected FCF in 2014 : \$45 million
- Expected FCF in 2015 : \$50 million
- Future FCF growth rate beyond 2015 : 5%
- Weighted average cost of capital : 9.4%

5. Innovation Company is thinking about marketing a new software product. Upfront costs to market and develop the product are \$5 million. The product is expected to generate profit of \$1 million per year for 10 years. The company will have to provide product support expected to cost \$100,000 per year in perpetuity. Assuming all profits and expenses occur at the end of the year, what is the NPV of this investment if the cost of capital is 6%? Should the firm undertake this project? (15 points)

6. The Halo Corporation is considering investing in a new cane manufacturing machine that has an estimated life of three years. The cost of the machine is \$30,000 and the machine will be depreciated straight line over its three-year life to a residual value of \$0. The cane manufacturing machine will result in sales of 2000 canes in year 1. Sales are estimated to grow by 10% per year each year through year three. The price per cane that Halo will charge its customers is \$18 each and is to remain constant. The canes have a cost per unit to manufacture of \$9 each. The firm is in the 35% tax bracket, and has a cost of capital of 10%. (15 points)

(a) What are the incremental EBIT of Halo corporation for years one through three?

- (b) What are the incremental unlevered net incomes for years one through three?
- (c) What is the depreciation tax shield for the Halo Corporation's project in the first year?
7. Consider a time horizon of 10 years. A bicycle manufacturer currently produces 300,000 units a year and expects output levels to remain steady in the future. It buys chains from an outside supplier at a price of \$2 a chain. The plant manager believes that it would be cheaper to make these chains rather than buy them. Direct in-house production costs are estimated to be only \$1.50 per chain. The necessary machinery would cost \$250,000 and would be obsolete after 10 years. This investment could be depreciated to zero for tax purposes using a 10-year straight-line depreciation schedule. The plant manager estimates that the operations would require additional working capital of \$50,000 but argues that this sum can be ignored since it is recoverable at the end of the 10th year. Expected proceeds from scrapping the machinery after 10 years are \$20,000. If the company pays taxes at a rate of 35% and the opportunity cost of capital is 15%, what is the net present value of the decision to produce the chains in-house instead of purchasing them from the supplier? (15 points)