

Practice Problems for FM250 Final Exam

NPV

1. Today's date is January 1, 2015 and Sanjana needs some advice. Suppose Project A has cash flows of \$32 starting at the end of this year, and continuing on for three more years (thus 4 years total). The cash flows then decrease by 2% each year after that, for 4 years. After that, cash flows increase by 8% for 5 years, and then decrease by 3% for 3 years. Assume the discount rate is 12%.
 - a) What is the NPV for Project A?
2. Today's date is January 1, 2015 and Wei needs some advice. Project A has cash flows of \$89 starting at the beginning of this year (i.e. today), and continuing on for three more years (thus 4 years total). The cash flows then increase by 3% each year after that, for 5 years. After that, cash flows decrease by 8% for 6 years. Assume the discount rate is 12%.
 - a) What is the NPV for Project A?

Cash Flows

- The current date is January 1, 2015. You are thinking about building a plant for a
3. project run by Sager Enterprises that will cost \$40K today. The plant will start producing immediately, and will generate revenues for 3 years, starting at the end of this year (December 31, 2015). Each year, the revenue will be \$80K. The material costs for the project each year will be \$40K, also starting at the end of this year. Labor costs will start at \$10K at the end of this year, and stay constant. The plant has a 4 year depreciation schedule, as prescribed by the IRS; assume the depreciation schedule is based on a 0 salvage value at the end of 4 years. Assume a tax rate of 40%, and that all taxes are paid at the end of the year. Assume a discount rate of 9%. At the end of the project, you expect to sell the plant for \$2K (i.e. on December 31, 2017), but this value is not used for calculating depreciation. You need to maintain working capital levels of \$15K at the end of this year and the end of next year; assume new working capital is fully recovered by December 31, 2017. The current level of working capital on January 1, 2015 is 0.
 - a) Should you invest in this plant?
 - b) Suppose that the tax rate is now 50%. By how much will your NPV decrease?
 4. The current date is January 1, 2015. You are thinking about building a plant for a project run by Wayne Enterprises that will cost \$50K today. The plant will start

producing immediately, and will generate revenues for 3 years, starting at the end of this year (December 31, 2015). Each year, the revenue will be \$120K. The material costs for the project each year will be \$40K, also starting at the end of this year. Labor costs will start at \$20K this year, and stay constant. The plant has a 4 year depreciation schedule, as prescribed by the IRS; assume the depreciation schedule is based on 0 salvage value after 4 years. Assume a tax rate of 40%, and that all taxes are paid at the end of the year. Assume a discount rate of 9%. At the end of the project, you expect to sell the plant for \$20K (i.e. on December 31, 2017), but you do not use this value for calculating depreciation. You need to maintain working capital levels of \$10K at the end of this year and the end of next year; assume new working capital is fully recovered by December 31, 2017. The current level of working capital on January 1, 2015 is 0.

- a) Should you invest in this plant?
 - b) Suppose the depreciation schedule for the plant is now over 5 years, instead of 4 years, as originally prescribed by the IRS. By how much does your NPV change?
5. True/False and Explain:
A shorter depreciation schedule increases the NPV of a project, all else equal (and assuming the discount rate is positive and constant over time).
6. True/False and Explain:
An increase in initial inventory requirements for a project decreases the project's NPV, all else equal.