*Spring 2015*

*FIN327*

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**Exercise Problems**

1. You have been hired as a consultant for Pristine Urban-Tech Zither, Inc. (PUTZ), manufacturers of fine zithers. The market for zithers is growing quickly. The company bought some land three years ago for $1 million in anticipation of using it as a toxic waste dump site but has recently hired another company to handle all toxic materials. Based on a recent appraisal, the company believes it could sell the land for $900,000 on an after tax bases. In four years, the land could be sold for $1,200,000 after taxes. The company also hired a marketing firm to analyze the zither market, at a cost of $125,000. An excerpt of the marketing report is as follows:

The zither industry will have a rapid expansion in the next four years. With the brand name recognition that PUTZ brings to bear, we feel that the company will be able to sell 6,700, 7,500, 9,100, and 6,200 unites each year for the next four years, respectively. Again, capitalizing on the name recognition of PUTZ, we feel that a premium price of $275 can be charged for each zither. Because zithers appear to be a fad, we feel at the end of the four-year period, sales should be discontinued.

PUTZ feels that fixed costs for the project will be $350,000 per year, and variable costs are 15% of sales. The equipment necessary for production will cost $3.1 million and will be depreciated according to a three-year MACRS schedule (33%, 45%, 15%, and 7% in years 1 through 4 respectively). At the end of the project, the equipment can be scrapped for $300,000. Net working capital of $120,000 will be required immediately. PUTZ has a 38% tax rate, and the require rate of return on the project is 13%. What is the NPV of the project? Assume the company has other profitable projects.

1. We are evaluating a project that costs $644,000, has an eight-year life, and has no salvage value. Assume that depreciation is straight-line to zero over the life time of the project. Sales are projected at 70,000 units per year. Price per unit is $37, variable cost per unit is $21, and fixed costs are $725,000 per year. The tax rate is 35 percent, and we require a 15 percent return on this project.
   1. Calculate the accounting break-even point.
   2. Calculate the base-case cash flow and NPV. What is the sensitivity of NPV to changes in the sales figure? Explain what your answer tells you about a 500-unit decrease in projected sales.
   3. What is the sensitivity of OCF to changes in the variable cost figure? Explain what your answer tells you about a $1 decrease in estimated variable costs.
   4. Suppose the projections given for price, quantity, variable costs, and fixed costs are all accurate to within 10 percent. Calculate the best-case and worst-case NPV figures.
2. We are examining a new project. We expect to sell 9,000 units per year at $35 net cash flow apiece for the next 10 years. In other words, the annual operating cash flow is projected to be $35\*9,000 = $315,000. The relevant discount rate is 16 percent, and the initial investment required is $1,350,000.
   1. What is the base-case NPV?
   2. After the first year, the project can be dismantled and sold for $950,000. If expected sales are revised based on the first year’s performance, when would it make sense to abandon the investment? In other words, a what level of expected sales would it make sense to abandon the project?
   3. Suppose you think it is likely that expected sales will be revised upward to 11,000 units if the first year is a success and revised downward to 4,000 units if the first year is not a success. If success and failure and equally likely, what is the NPV of the project? Consider the possibility of abandoning in answering.
   4. In the previous part, what is the value of the option to abandon?