

B02031: FINANCIAL PLANNING AND POLICY

CHAPTER 3: PROJECT RISK ANALYSIS

EX1:

Exhibit P3-7.1 TitMar Motor Company PTV Project

Assumptions and Predictions	Estimates
Price per unit	\$ 4,895
Market share (%)	15.00%
Market size (year 1)	200,000 units
Growth rate in market size beginning in year 2	5.0%
Unit variable cost	\$ 4,250
Fixed cost	\$9,000,000
Tax rate	50.0%
Cost of capital	18.00%
Investment in net working capital	5.00% of the predicted change in firm revenue
Initial investment in PPE	\$7,000,000
Annual depreciation (5-year life with no salvage)	\$1,400,000

The TitMar Motor Company is considering the production of a new personal transportation vehicle (PTV). The PTV would compete directly with the innovative new Segway. The PTV will utilize a three-wheel platform capable of carrying one rider for up to six hours per battery charge thanks to a new battery system developed by TitMar. TitMar's PTV will sell for substantially less than the Segway but will offer equivalent features. The pro forma financials for the proposed PTV project, including the forecasts and assumptions that underlie them, are set out in Exhibit P3-7.1. Note that revenue is calculated as follows: price per unit * marketshare (%) * market size and units sold = revenues/price per unit. The project offers an expected NPV of \$9,526,209 and an IRR of 39.82%. Given TitMar's stated hurdle rate of 18%, the project looks like a winner. Even though the project looks very good based on management's estimates, it is risky and can turn from a positive NPV investment to a negative one with relatively modest changes in the key value drivers. Develop a spreadsheet model of the project valuation and answer the following questions:

- If the firm's market share turns out to be only 5%, what happens to the project's NPV and IRR?
- If the market share remains at 15% and the price of the PTV falls to \$4,500, what is the resulting NPV?

EX2:

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 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.

- a) Construct the project's FCF and calculate NPV of the project.
- b) 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.
- c) 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.

Suppose the projections given for price, quantity, variable costs, and fixed costs are all accurate to within ± 10 percent. Calculate the best-case, expected-case, and worst-case NPV figures.

EX3:

Bridgeway Pharmaceuticals manufactures and sells generic over-the-counter medications in plants located throughout the Western Hemisphere. One of its plants is trying to decide whether to automate a portion of its packaging process by purchasing an automated waste disposal and recycling machine. The proposed investment is \$400,000 to purchase the necessary equipment and get it into place. The machine will have a five-year anticipated life and will be depreciated at a rate of \$80,000 per year, toward a zero anticipated salvage value. The firm's analysts estimate that the purchase of the new waste-handling system will bring annual cost savings of \$40,000 from reduced labor costs, \$18,000 per year from reduced waste disposal costs, and \$200,000 per year from the sale of reclaimed plastic waste net of selling expenses. Bridgeway requires a 20% return from capital investments and faces a 35% tax rate.

- a. Using the estimates provided, should Bridgeway purchase the new automated waste-handling system?
- b. The manager at the plant where the handling system is being contemplated has raised some questions regarding the potential savings from the system. He asked the financial analyst in charge of preparing the proposal to evaluate the impact of variations in the price of plastic waste materials, which have proven to be volatile in the past. Specifically, what would be the impact of price reductions for the waste that drive the revenues from the sale of waste down to half their estimated amounts in years 1 through 5?