1. You own your own firm, and you want to raise $30 million to fund an expansion. Currently, you own 100% of the firm’s equity, and the firm has no debt. To raise the $30 million solely through equity, you will need to sell two-thirds of the firm. However, you would prefer to maintain at least a 50% equity stake in the firm to retain control.
2. If you borrow $20 million, what fraction of the equity will you need to sell to raise the remaining $10 million? (Assume perfect capital markets.)
3. What Is the smallest amount you can borrow to raise the $30 million without giving up control? (Assume perfect capital markets.)
4. Zymase is a biotechnology start-up firm. Researchers at Zymase must choose one of three different research strategies. The payoffs (after-tax) and their likelihood for each strategy are shown below. The risk of each project is diversifiable.

**Strategy Probability Payoff($ million)**

A 100% 75

B 50% 140

50% 0

C 10% 300

90% 40

1. Which project has the highest expected payoff?
2. Suppose Zymase has debt of $40 million due at the time of the project’s payoff. Which project has the highest expected payoff for equity holders?
3. Suppose Zymase has debt of $110 million due at the time of the project’s payoff. Which project has the highest expected payoff for equity holders?
4. If management chooses the strategy that maximizes the payoff to equity holders, what is the expected agency cost to the firm having $40 million in debt due? What is the expected agency cost to the firm from having $110 million in debt due?
5. You would like to compare Ideko’s profitability to its competitors’ profitability using the EBITDA/sales multiple. Given Ideko’s current sales of $75 million, use the information in the following table to compute a range of EBITDA for Ideko assuming it is run as profitably as its competitors.

**Ideko Sporting Goods**

**Ratio (Proposed) Oakley, Inc. Lux Group Nike, Inc Industry**

P/E 21.6x 24.8x 28.0x 18.2x 20.3x

EV/Sales 2.0x 2.0x 2.7x 1.5x 1.4x

EV/EBITDA 9.1x 11.6x 14.4x 9.3x 11.4x

EBITDA/Sales 21.7% 17.0% 18.5% 15.9% 12.1%

1. Assume that Ideko’s market share will increase by 0.5% per year rather than 1%. What production capacity will Ideko require each year? When will an expansion become necessary (when production volume will exceed the current level by 50%)?