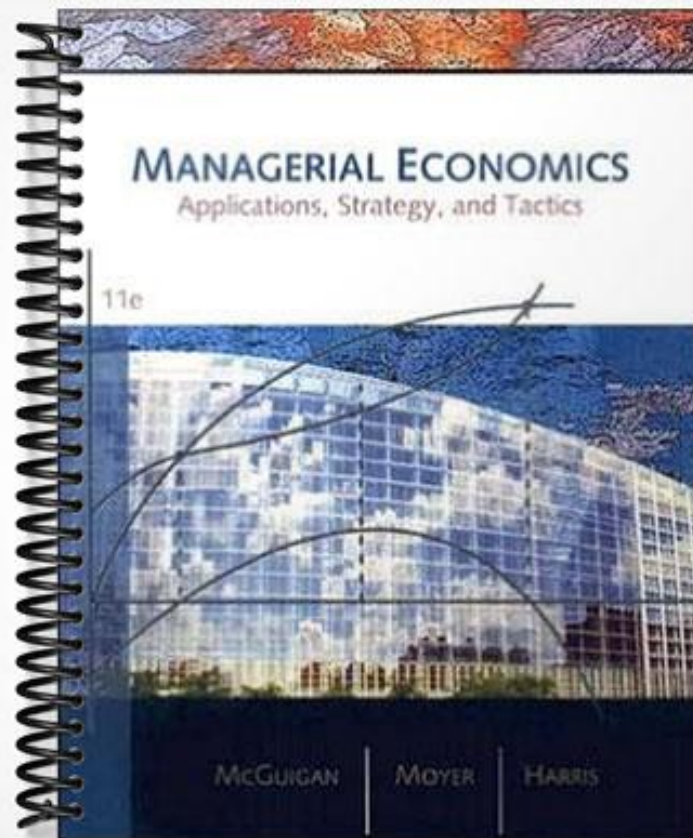


# SOLUTIONS MANUAL



## MANAGERIAL ECONOMICS

Applications, Strategy, and Tactics

11e

McGUIGAN | MOYER | HARRIS

## Chapter 2

# Fundamental Economic Concepts

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## Solutions to Exercises

1. Because rental cars are jointly consumed with gasoline. Low fuel efficiency of Explorers and Trailblazers combined with very high gasoline input prices for the complementary product, decrease the rental demand for these SUVs.

$$2. \quad a. \quad P(r < 0) = P[z < (0 - 100,000)/40,000] \\ = P(z < -2.50) = .0062$$

$$b. \quad P(r < 20,000) = P[z < (20,000 - 100,000)/40,000] \\ = P(z < -2.00) = .0228$$

3. At the margin of the typical household, the marginal use value of diamonds is much higher than that of water. No less importantly, at those same margins, the marginal cost of water is much lower than that of diamonds.

4. Project B appears riskier because it has a larger standard deviation than Project A.

$$v_A = \$40,000/\$50,000 = 0.80$$

$$v_B = \$125,000/\$250,000 = 0.50$$

Project A is riskier since it has a larger coefficient of variation than Project B.

Because the two projects are significantly different in size, the coefficient of variation (a relative measure of risk) is more appropriate.

5. a. Based on past performance, and the nature of the industry in which Amgen operates, one could conclude that Amgen is a high risk firm. As a high-risk firm, returns can be expected to be quite volatile over time. This is evident in the record of past performance by the firm. However, as a high-risk firm, there should be opportunities to earn very high returns during some periods. The projected profit performance of Amgen is consistent with this expectation.

b. Amgen's projected high return on equity can be justified as the payoff for many years of expensive and high risk research and development work that only recently began to generate cash

flows and profits. Without the prospect of high future profits, few investors would be willing to commit capital to risky firms such as Amgen.

6. a. Expected annual revenues =  $\$90(.2) + \$75(.5) + \$85(.3)$   
 $= \$77,175,000$

b. Standard deviation of annual revenues =  
 $[(90 - 77.175)^2(.2) + (75 - 77.175)^2(.5) + (85 - 77.175)^2(.3)]^{.5}$   
 $= \$96,492,063$

c. Coefficient of variation =  $v = 96.492063 / 77.175$   
 $= 0.250$

7. a. Because the price distribution is normal, the expected price is halfway between the most optimistic price and the most pessimistic price, or \$1.5 million.

b. From Table 1, the z value corresponding to leaving 10 percent in the lower tail of a normal distribution is approximately -1.28. Therefore, -1.28 standard deviations corresponds with a distance of \$500,000 below the mean (\$1 million minus \$1.5 million). Hence one standard deviation is equal to:

$$\begin{aligned} -1.28\sigma &= -\$500,000 \\ \sigma &= \$390,625 \end{aligned}$$

c.  $z = (\$1.2 \text{ million} - \$1.5 \text{ million}) / \$390,625 = -0.77$

From Table 1, the  $p(z < -0.77) = 22.06\%$

8. Projects A, C, G and B require a total of \$875 million in investment. Project B, the lowest return project of this group is expected to generate an 18 percent rate of return. Ajax can raise up to \$1,050 million, with the highest cost being 18 percent for the last \$200 million. If Ajax were to choose any project beyond A, C, G, and B—such as project D (the next best project after B)—that project would generate a marginal rate of return (16 percent), which is less than the marginal cost of funds needed to finance it, in this case 18 percent for the last \$200 million up to a total of \$1,050. Thus, the optimal capital budget is to invest in projects A, C, G, B, for a total of \$875 million.