

Quiz B: 08/08/14

Name Key

Your boss has asked you to determine how being able to expand a proposed facility will affect the value of the facility. Set up the calculations needed to provide her with an answer.

Information on the facility:

Cost to build facility = \$105 million

Present value today of the facility's cash flows: first three years = \$30 million; first four years = \$75 million; all seven years = \$135 million

Life of factory = seven years

Proceeds if sell factory at any time over the next four years = \$45 million

Standard deviation of returns on factory: first year = 30%; first three years = 35%; first four years = 38%; all seven years = 40%

Information on possible expansion of the facility:

Cost to expand at any time over the next three years = \$30 million

Present value of expansion's cash flows: PV at the time of expansion = \$28.5 million; PV today = \$24 million

Life of expansion = seven years (once built)

Standard deviation of returns on expansion: over next three years = 45%; over next ten years = 50%

Returns on U.S. Treasuries: 1-year = 1.5%; 2-year = 2%; 3-year = 2.5%; 4-year = 3%; 5-year = 3.5%; 7-year = 4%; 8-year = 5%; 10-year = 5.5%

$$+6(C = \overset{+10}{24} N(d_1) - PV(K) N(d_2)) \quad (16)$$

$$+6(d_1 = \frac{\ln(\overset{+10}{24}/\overset{+10}{PV(K)})}{\overset{+10}{.45}\sqrt{3}} + \frac{.45\sqrt{3} + \overset{+5}{2}}{\quad}) \quad (21)$$

$$+6(PV(K) = \frac{\overset{+10}{30}}{(1.025)^{\overset{+5}{3}}}) \quad (31)$$

$$+6(d_2 = d_1 - \overset{\vee}{.45}\sqrt{3}) \quad (6)$$

+1 \Rightarrow look up $N(\cdot)$ using Excel or tables