

Quiz B: 4/25/12

Name & Time Key

Quiz: Set up the calculations needed to determine whether Astro Mining should build the factory.

Astro Mining Inc. has an opportunity to invest \$300,000 in a factory that will generate cash flows over the next five years equal to \$105,000 and will generate cash flows over its 15-year life equal to \$290,000. If the factory's sales exceed expectations, the factory can be expanded any time over the next five years at an expected cost of \$200,000. The expansion will generate cash flows with an expected present value at the time of the expansion equal to \$205,000 and with an expected present value today of \$140,000. The standard deviation of returns on the factory over the next five years is expected to equal 41% and over its 15-year life is expected to equal 38%. This is less than the standard deviation of returns on the expansion which is expected to equal 51% over the next five years and 43% once it is built (if it is). The return on Treasuries varies with maturity as follows: 1-year = 0.173%; 2-year = 0.278%; 3-year = 0.404%; 4-year = 0.631%; 5-year = 0.852%; 10-year = 1.976%; 15-year = 2.484%.

Note: Bonus WSJ Questions on back of page

Both CF are present values.

$$+2 (NPV = -300,000 + 290,000 + C) \text{ (8)}$$

$$+3 (C = S \times N(d_1) - PV(K) \times N(d_2))$$

$$+3 (d_1 = \frac{\ln(\frac{S}{PV(K)})}{\sigma \sqrt{T}} + \frac{\sigma \sqrt{T}}{2})$$

$$+2 (d_2 = d_1 - \sigma \sqrt{T})$$

+1 (N())  $\Rightarrow$  look up on tables or in Excel (normdist)

$$+6 S = 140,000$$

$$+2 (PV(K) = \frac{200,000}{(1.00852)^5}) \text{ (17)}$$

$$+6 (\sigma = .51)$$

$$+4 (T = 5)$$