

Quiz A: 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 \$500,000 in a new factory that will generate cash flows over the next four years that have a present value of \$115,000 and will generate cash flows over its 15-year life that have an expected present value equal to \$475,000. If the project's cash flows fall short of expectations, the factory can be sold for \$450,000 any time over the next four years. The standard deviation of returns on the factory is expected to equal 35% over its 15-year life. However the standard deviation will be much higher at 53% over the first four years of its life. This compares to a standard deviation of returns on the firm as a whole of 29%. 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

$$x2 \quad NPV = -500,000 + 475,000 + P \quad (8)$$

$$x3 \quad P = PVCK (1 - N(d_2)) - S(1 - N(d_1))$$

$$x3 \quad d_1 = \frac{\ln\left(\frac{S}{PVCK}\right) + \frac{\sigma\sqrt{T}}{2}}$$

$$x2 \quad d_2 = d_1 - \sigma\sqrt{T}$$

x1 (NC) \Rightarrow look upon tables or in Excel (normsdist)

$$x6 \quad S^* = 475,000 - 115,000$$

$$x2 \quad PVCK = \frac{450,000}{(1.00631)^4} \quad (17)$$

$$\sigma = .53 + 6$$

$$T = 4 + 4$$