

Fin 350

Quiz 4

1. Innovation Communications are thinking of getting into a local phone market. The face the following choice. If they use fiber optic cable, it will cost \$150 million to lay and they anticipate that profits will be \$12 million in the first year and anticipate a growth rate of 2% in perpetuity. If they use copper instead, the cost to lay the lines will be less, only \$120 million. However, copper requires much more maintenance, so they anticipate that all the extra revenue from growth will go to maintenance (i.e., with copper they expect profits to be \$12 million in perpetuity). The current discount rate is 8%.

1. What is the IRR of both options? [1]

$$\text{IRR} = 12/150 + 0.02 = 10\%$$

$$\text{IRR} = 12/120 = 10\%$$

2. What does the IRR rule say about whether either option should be taken. If both options are acceptable, since they are mutually exclusive, what does IRR say about which type of cable should be laid? [1]

Since both IRR's exceed the discount rate, both are acceptable. Since both IRR's are the same the rule cannot distinguish the projects.

3. What does the NPV rule say about (2)? [2]

$$\text{NPV} = 12/(0.08-0.02) - 150 = \$50 \text{ mil}$$

$$\text{NPV} = 12/(0.08) - 120 = \$30 \text{ mil}$$

NPV says both are acceptable, but the best thing to do is to lay fiber optic cable

4. Explain. [1]

IRR cannot be used to pick between mutually exclusive project because it does not adequately account for the timing of the cashflows.

2. Over a 4 year period you observe the following returns for stock A: -12%, 14%, -6%,13% (calculated assuming all dividends are reinvested). Calculate:

(i) Mean return [1]

$$(-12+14-6+13)/4 = 2.25\%$$

(ii) Variance and Standard Deviation [2]

$$\frac{(-0.12 - 0.0225)^2 + (0.14 - 0.0225)^2 + (-0.06 - 0.0225)^2 + (0.13 - 0.0225)^2}{3} = 0.0175$$

$$SD = \sqrt{0.0175} = 0.1323$$

(iii) If you invest \$1 at the beginning of the first year and reinvested all dividends, what would your investment be worth 4 years later? [1]

$$(1 - 0.12)(1.14)(1 - 0.06)(1.13) = 1.0656$$

3. Assuming you are evaluating one project. Describe a condition under which you will choose NOT to undertake the project even if the NPV is positive. [1]

If the project can be delayed and the expected NPV in the future exceeds the NPV today