

Name:

Fin 350

Quiz 3

1. Single Trak Bike is a single product company that is about to start selling revolutionary new suspension system for mountain bikes. They expect to sell only this product. They estimate that it will take the competition about 2 years to catch up. As such they project that the initial profits will be \$1,000,000 in the first year with 50% growth in the second year. After that, profits should decline at about 10%/yr in perpetuity as the competition brings their own products on line and new products are developed. If there are 100,000 shares outstanding, what is the price per share if the discount rate is 12%? [3]

$$PV = \frac{\$1,000,000}{1.12} + \frac{\$1,000,000(1.5)}{1.12^2} + \frac{\$1,000,000(1.5)(0.9)}{0.22} \left(\frac{1}{1.12^2} \right)$$
$$= \$6,980,519$$

Price per share is \$69.81

2. In about a week the Washington State Lottery will be offering players the following choice: (a) take the total winnings in 25 equal payments over the course of twenty five years (i.e., each annual payment is $1/25^{\text{th}}$ of the total winnings --- the current system), or (b) take half the total winnings as a lump sum payment today. If the discount rate is 5%, what should you opt for? (Hint: The actual amount of the winnings does not affect your answer, however, if it will make it easier, you can use a specific number.) [3]

Let the total winnings be x. Then you can either take x/2 today or take 25 payments of x/25 over twenty years. The PV of the latter choice is:

$$PV = \frac{x}{25} \left(1 - \frac{1}{1.05^{25}} \right) = 0.564x$$

So you should take the payments over the next 25 years!

Note: Before you go out and implement this when you next buy lottery tickets, you might want to consult a tax accountant.

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3. You have the opportunity to invest in a project that will deliver \$10,000 in the first year and then growing at 1%/annum, in perpetuity. The project will cost you \$40,000.

i) What is the IRR? [3]

$$\frac{10,000}{r - .01} = 40,000$$

$$r = \frac{10,000}{40,000} + 0.01 = 26\%$$

ii) In this case, would the IRR rule give the right answer (no matter what the discount rate was). Explain why or why not. [1]

In this case IRR gives the right answer because the rule gives the same answer as the NPV rule. That is, whenever the IRR is greater than the discount rate the NPV will be positive.