

## Chapter 27

1. Whitewater Raft Tour Company can purchase rafts today for €100,000. They will earn a €40,000 return on the rafts at the end of each of the next three years.

a. If the interest rate were 12 per cent, what is the present value of each of the future returns that Whitewater Raft expects to receive?

Answer:

$$€40,000/1.12 = €35,714.29; €40,000/(1.12)^2 = €31,887.76; €40,000/(1.12)^3 = €28,471.21$$

b. If the interest rate were 12 per cent, should Whitewater Raft invest in the rafts? Explain.

Answer:

No, the cost is €100,000 but the present value of the return is only €96,073.26.

c. If the interest rate were 7 per cent, should Whitewater Raft invest in the rafts? Explain.

Answer:

Yes. Although the cost is still €100,000, the present value of the returns is now the sum of  $€40,000/1.07$ ;  $€40,000/(1.07)^2$ ;  $€40,000/(1.07)^3$  which is €104,972.65.

d. Compare your answers to parts (b) and (c) above. What general principle about the relationship between investment and the interest rate is demonstrated?

Answer:

Investment is inversely related to the interest rate—lower interest rates stimulate investment.

2. Use the rule of 70 to answer the following questions. Suppose that real GDP/person in Fastcountry grows at an annual rate of 2 per cent and that real GDP/person in Slowcountry grows at an annual rate of 1 per cent.

a. How many years does it take for real GDP/person to double in Fastcountry?

Answer:

$$70/2 = 35 \text{ years.}$$

b. If real GDP/person in Fastcountry is €2000 in 1935, how much will it be in the year 2005?

Answer:

$$€8,000$$

c. How many years does it take for real GDP/person to double in Slowcountry?

Answer:

$$70/1 = 70 \text{ years.}$$

- d. If real GDP/person in Slowcountry is €2000 in 1935, how much will it be in the year 2005?

Answer:  
€4,000

- e. Use the numbers you calculated above to help explain the concept of compound growth.

Answer:  
Fastcountry adds €2,000 to its GDP/person in the first 35 years. Growing at the same percent, it adds €4,000 to its GDP over the next 35 years because the same growth rate is now applied to a larger base.

- f. If Fastcountry stopped growing in the year 2005, how many years would it take for the standard of living in Slowcountry to catch that of Fastcountry?

Answer:  
Another 70 years.

3. For each of the following, determine the type of problem from which the insurance market suffers (adverse selection or moral hazard) and explain.

- a. Susan buys health insurance at the non-smoker rate. After she obtains the insurance, she begins smoking again.

Answer:  
Moral hazard, because after she obtained the insurance, she is less careful with her health.

- b. Bruce discovers that he has a liver condition that will shorten his life. He seeks life insurance to help pay for his children's college expenses.

Answer:  
Adverse selection, because after he knows that his probability of death is higher than average, he seeks life insurance.

- c. After Lisa gets fire insurance on her house, she burns fires in the fireplace without placing a fireguard in front of it.

Answer:  
Moral hazard, because after she obtains the insurance, she becomes less careful with fire.

4. Rachel is an extremely picky eater. When choosing a restaurant, she always chooses to eat at a buffet. At a buffet, she doesn't have to order off a menu so she doesn't have to risk ordering something she may not like. Rachel knows that buffet food is very ordinary and, because she avoids nice restaurants, she misses the chance to eat some exceptional foods that she would enjoy very much. On the other hand, she never has a meal that she is unwilling to eat.
- a. Does Rachel gain as much utility from a truly great meal as she loses from eating a meal she dislikes? Explain.

Answer:

No. She dislikes bad food more than she likes good food.

- b. What can you say about Rachel's utility function with regard to her preferences toward risk? Explain.

Answer:

Rachel is risk averse because she exhibits diminishing marginal utility of wealth (she dislikes spending, say, €30 on a meal she dislikes more than she enjoys spending €30 on a meal she loves.)

- c. How does the availability of a buffet help Rachel reduce her risk? Explain.

Answer:

She can diversify her risk at a buffet – she does not "put all of her eggs in one basket" at a buffet. This reduces her standard deviation of meals because her meals are always adequate but never terrible or great. A buffet is like an investment fund of food.