

CHAPTER 14

MARKETS FOR OTHER RESOURCES

Microeconomics in Context (Goodwin, et al.), 1st Edition (Study Guide 2008)

Chapter Summary

Having learned about the market for labor, in this chapter you will look at the markets for other resources, with a particular focus on capital stocks. The material in this chapter will be particularly important for you if you are interested in business, finance, or environmental studies.

One of the important concepts explored in this chapter is discounting. Discounting is a method for taking time into account in valuation of capital. When you are finished with this chapter, you will be able to explain why a payment of \$1,000 today is more valuable than a payment of \$1,000 two years from now. You will also be able to explain the difference between discounting sums of money over time and the much more complicated question of whether other values can or should be discounted over time.

You will also learn about the debates surrounding the Coase Theorem, one approach that has been proposed for dealing with the problem of externalities; you will be able to explain the role of social capital in estimating the value of a business; and you will understand the basics of how stock and bond markets operate.

Objectives

After reading and reviewing this chapter, you should be able to:

1. Discuss how the value of a capital stock is determined.
2. Understand the concept of discounting.
3. Describe the difference between risk and uncertainty.
4. Define how a firm in the simple mechanical model makes decisions about capital.
5. Explain the difference between the economic and ecological view of natural capital.
6. Describe the Coase Theorem.
7. Discuss how social capital is taken into account when estimating the value of a business.
8. Discuss the role of financial capital markets in business decisions.
9. Summarize how bond and stock markets operate, and what factors affect bond and stock prices.

Key Terms

returns to capital
discount rate
uncertainty

present discounted value
risk
sensitivity analysis

appreciation
marginal revenue product of
(manufactured) capital
Coase Theorem
goodwill
bond
maturity date
bond price
stocks
annual return on a share of stock
growth stocks
institutional investors

investor confidence
marginal factor cost of
(manufactured) capital
liquidation value
retained earnings
coupon amount
face value
bond yield to maturity
dividends
speculation
speculative bubble

Active Review

Fill in the blank

1. The value today of a payment you will receive ten years from now is the _____ of the payment.
2. An increase in expected returns on a capital investment will (increase/decrease) _____ the present discounted value of the investment.
3. The _____ Theorem holds that if property rights are well defined and transaction costs are minimal, then markets can allocate resources efficiently even in the presence of externalities.
4. The value of the physical assets of a firm, if the firm were sold and its assets sold separately, is the firm's _____ value.
5. The country of Economica has only a few banks. Most loans are arranged through personal connections, and they generally involve a high interest rate to compensate for the risk taken on by the lender. This situation can be described as a(n) _____ financial market.
6. A large business sells a bond. The amount of principal that will be repaid is called the _____ of the bond.
7. The fixed amount paid on a bond per year is called the _____ amount.
8. The annual rate of return on a bond if you hold it until it returns is the _____.
9. A portion of a company's profits are distributed to stockholders in the form of _____.

10. Buying and selling assets in the hope of profiting from appreciation or depreciation in asset values is known as _____.

11. Pension funds and insurance companies can act as _____ investors.

True or False

12. Assuming there is no inflation, a payment of \$5,000 today has the same value as a payment of \$5,000 six months from now.

13. When you purchase a bond, you get partial ownership of a firm.

14. Growth stocks are investments that are guaranteed to increase over time.

15. Rates of household saving in Japan are about the same as rates of household saving in the U.S.

Short Answer

16. Describe how a downturn in the stock market could affect bond prices.

17. Explain why decision-making about radioactive pollution from a nuclear power plant should not necessarily involve discounting.

18. Suggest one reason why discounting may be inappropriate for decisions that weigh human well-being in the present against human well-being in the future. Illustrate with an example.

Problems

1. Annika wants to buy a computer from Jeremy. However, she doesn't have the money right now, so she arranges to pay him one year from today. Jeremy's bank account pays an interest rate of 7%. Ignoring the factor of risk, if the price of the computer is \$1,000 today, what should Annika pay Jeremy in one year?

2. You work as a consultant for a small company. The company offers you a contract in which you will receive a payment of \$5,000 one year from today. Using a discount rate of 7%, what is the present discounted value of the payment?

3. Roxanne will receive a total of \$20,000 over a period of four years. She will receive an initial installment of \$8,000 one year from now; then she will receive \$4,000 per year for the next three years. Calculate the total present discounted value of the \$20,000, using a discount rate of 5%.

4. a. Calculate the present discounted value of \$100,000 received five years from now, using a discount rate of 5%. (Note that the present discounted value formulas given in the Math Review in your text generalize to the following formula for discounting, where t is the number of years in the future and i is the discount rate:
$$\text{Value}_0 = \text{Value}_t / (1+i)^t$$
)

b. Repeat the calculation, using an 8% discount rate.

- c. Do you think it makes sense to calculate future “costs of illness” or “costs of death” in this way? What are the problems with applying a discount rate to this kind of calculation?

Self Test

1. You purchase a company bond that will pay \$90 per year for 5 years and then pay you \$500 at the end of 5 years. The \$500 you receive at the end of the 5 years is known as the
 - a. Coupon amount of the bond.
 - b. Bond value of the bond.
 - c. Maturity value of the bond.
 - d. Face value of the bond.
 - e. Discounted value of the bond.

2. You hold a company bond that pays \$2 per year for 5 years and then pays \$100 at the end of 5 years. Currently, however, bond buyers can get bonds that pay \$3 per year. As long as you continue to hold the bond, its yield to maturity is equal to
 - a. \$2
 - b. 2%
 - c. \$3
 - d. 3%
 - e. \$6.66

3. Joan buys a new bread-making machine, which she plans to use to make bread for sale. The monetized value of what Joan expects to get back from this investment in the future is referred to as
 - a. marginal returns to scale
 - b. discounted capital
 - c. returns to capital
 - d. variable return
 - e. capital risk

4. Company ABC runs a calculation of expected returns using several possible assumptions about the life of capital investments, interest rates, and other factors. The company is carrying out a(n)
 - a. market value analysis
 - b. sensitivity analysis
 - c. risk analysis
 - d. risk assessment
 - e. cost-benefit analysis

5. A profit-maximizing firm in the traditional neoclassical model hires capital services up to the point where the marginal revenue product of manufactured capital is equal to
 - a. MFC_{MK}
 - b. Wages
 - c. Price of the good demanded
 - d. MRF_{MK}
 - e. MP_Q

6. According to the economic view of natural capital,
 - a. Resources are valuable only to the extent that they contribute to profitability.
 - b. Natural resources have no value.
 - c. Natural resources are valued for their contribution to our long-term survival on earth.
 - d. Endangered species are valued above other, non-endangered species.
 - e. None of the above.

7. A factory discharges toxic waste into a river, killing the fish that people depend on for food. According to the Coase Theorem,
 - a. Defining clear property rights to the resources of clean water and healthy fish can solve this problem, if transaction costs are not too high.
 - b. There is no solution to the problem of externalities created by the factory.
 - c. This problem could potentially be solved by the people owning the river, and charging the factory owner for discharging waste.
 - d. This problem could potentially be solved by factory owner owning the river, and collecting fees from the people for *not* discharging waste.
 - e. Options a, c, and d are all correct.

8. A company goes out of business and sells all its physical assets one by one. The money earned on these sales is the company's
 - a. liquidation value

- b. liquidity value
 - c. good-will value
 - d. discounted value
 - e. social capital
9. Which of the following is *not* a way in which a company that wants to finance growth can get funds?
- a. taking out a loan
 - b. using retained earnings
 - c. selling stock
 - d. borrowing on an informal financial market
 - e. buying a bond
10. The fixed amount paid each year on a bond is its
- a. face value
 - b. coupon amount
 - c. maturity value
 - d. immature value
 - e. bond price
11. A speculative bubble is a situation in which
- a. People stop buying assets suddenly.
 - b. People start buying assets suddenly.
 - c. People's optimism causes stock values to rise higher than the value that would match the actual assets and profitability of a firm.
 - d. Mutually reinforcing pessimism causes bond prices to plummet.
 - e. People share inaccurate information about a firm, causing prices to fluctuate rapidly above and below true prices.
12. The sum of dividends on a share of stock, plus any capital gains and losses this year, is the
- a. Annual return on a share of stock.
 - b. Dividend return on a share of stock.
 - c. Growth stock value.
 - d. Speculative value of a stock.
 - e. Face value of a stock.

13. Suppose you are trying to sell a machine that makes candy. The machine is capable of making \$1,000 worth of candy every year for eight years. At the end of that time, the machine will have to be discarded and will have no more value. Which of the following statements is true?
- A buyer would be expected to pay exactly \$8,000 for the machine.
 - A buyer would be expected to pay more than \$8,000 for the machine.
 - The value of the machine is exactly \$8,000, but a buyer is likely to pay slightly less.
 - A buyer would be expected to pay less than \$8,000 for the machine.
 - The value of the machine is \$7,400.
14. Risk refers to a situation in which
- Exact outcome can be predicted.
 - The outcome is known, but hazardous.
 - Exact outcome is not known, but the likelihood of each possible outcome is known.
 - Exact outcome is unknown and the likelihood of any given possible outcome is also unknown.
 - None of the above.
15. Investor confidence can be an important factor helping to determine
- The inherent value of natural capital.
 - The price of a capital asset.
 - The demand for a firm's product.
 - The sensitivity analysis of demand for a product.
 - The social value of a capital asset.
16. Which of the following statements is true regarding financial markets?
- They tend to adjust very slowly to changes in supply and demand.
 - Active traders work on one side of the market only.
 - Resale markets are very important.
 - They are characterized by low volatility.
 - All of the above are true.

17. Which of the following statements is true?
- a. \$100 received next year is worth \$105 if received today, using a 5% discount rate.
 - b. Risk refers to a situation in which the probabilities of possible outcomes are unknown.
 - c. The stock and bond markets operate completely independently from one another.
 - d. Discounting allows future costs to be expressed in terms of present value.
 - e. All of the above are false.
18. Which of the following is unlikely to change the market value of a company's stocks?
- a. An increase in the value of negative externalities.
 - b. An increase in the value of positive externalities.
 - c. Changing levels of investor optimism.
 - d. An increase in the interest rate.
 - e. Both a and b are true.
19. In which of the following situations would it be most appropriate to use discounting?
- a. Choosing what school your child should attend.
 - b. Deciding how much to pay for a business asset.
 - c. Deciding where to site a nuclear facility.
 - d. Deciding on an acceptable level of water pollution.
 - e. Deciding whether to cut down a stand of trees.
20. Suppose you possess an asset that produces \$2,000 in income each year. Assuming a discount rate of 5%, what is the present discounted value of the returns to capital on the asset three years from now?
- a. \$1,728
 - b. \$2,000
 - c. \$2,700
 - d. \$2,315
 - e. \$2,997

Answers to Active Review Questions

1. present discounted value
2. increase
3. Coase
4. liquidation
5. informal
6. face value
7. coupon
8. bond yield to maturity
9. dividends
10. speculation
11. institutional
12. False
13. False.
14. False.
15. False.
16. A downturn in the stock market can lead investors to buy more bonds, thus driving up bond prices.
17. Negative effects of the radioactive pollution could occur many years in the future. Using discounting can make those future costs appear very small, and thus can lead to poor decision-making.
18. Discounting is designed to answer relatively straightforward questions about the role of time in the value of payments made or received by one person or entity at different possible points in time. When decisions are being made about human well being at different points in time, the picture gets more complicated. For example, what if a decision is weighing one person's enjoyment of a technology (e.g. a polluting motor boat) now, versus her grandchild's likelihood of developing a disease related to that technology (e.g. asthma from air pollution) in the future? Enjoyment of a motor boat and suffering caused by asthma are hard to convert into money values, although economists often do attempt to monetize values of this kind. Even if you believe it is possible to monetize these values, discounting does not take into account the fact that different people are involved at different times. Discounting might show that the grandchild's suffering from asthma has a low value because it occurs far in the future – but the grandchild might disagree with that assessment.

Answers to Problems

1. $\$1,000 \times 1.07 = \$1,070$
2. $\frac{\$5,000}{1.07} = \$4,672.90$
- 3.

Year	Present Discounted Value of \$ Received
1	$= \frac{\$8,000}{(1.05)} = \$7,619$
2	$= \frac{\$4,000}{(1.05)^2} = \$3,628$
3	$= \frac{\$4,000}{(1.05)^3} = \$3,455$
4	$= \frac{\$4,000}{(1.05)^4} = \$3,291$
Total	\$17,993

4. a. $\frac{\$100,000}{(1.05)^5} = \$78,352.62$

4. b. $\frac{\$100,000}{(1.08)^5} = \$68,058.32$

4. c. Using a higher discount rate produces a lower present discounted value.

5. This bond carries a coupon of 9 ¾% and matures in 2012. At the close of yesterday's trading, the bond price was \$86, a one cent gain over the closing price from the day before. The yield to maturity is 2.5%.

6. a.

$$\frac{\$100,000}{(1.05)^{100}} = \$760$$

6. b.

$$\frac{\$1,000,000}{(1.05)^{102}} = \$6,897$$

6.c. Discounting makes sense for a situation in which one person is making decisions about a sum of money (e.g. understanding the difference between \$100 received today and \$100 received next year). In contrast, a human life is not a value that can be discounted over time; presumably, a child's untimely death 100 years from now is just as tragic as it would be if it occurred today. Furthermore, a situation such as that described here involves intergenerational effects. The person who will develop

leukemia is not even alive at the time of the decision about whether to pollute the lake, and thus has no opportunity to express his or her preference for clean, safe water.

Answers to Self Test Questions

1. d
2. b
3. c
4. b
5. a
6. a
7. e
8. a
9. e
10. b
11. c
12. a
13. d
14. c
15. b
16. c
17. d
18. e
19. b
20. a