

## B02030: BUSINESS FINANCE

### CHAPTER 2: HOW TO CALCULATE PRESENT VALUES

**EX1:** An amount of \$100 is invested in 3 years at annual interest rate of 7%. Simple interest rate is applied.

Calculate the amount of money that will be received after 3 years.

**EX2:** An amount of \$100 is invested in 3 years at annual interest rate of 7%. Compound interest rate is applied.

Calculate the amount of money that will be received after 3 years.

**EX3:**

- What is the one-year discount factor of \$1 at an interest rate of 35% per year?
- What is the discount rate/ interest rate per year of \$1 if the two-year discount factor is 0.7222?

**EX4:** An amount of \$2,000 was invested at the beginning of year 1 at annual interest rate of 6%. Calculate the value of the investment at the end of year 3.

- Compounding is done on annually basis.
- Compounding is done on quarterly basis.

**EX5:** An amount of \$100 was invested at the beginning of year 1. Calculate the value of the investment at the end of year 6. Knowing that compounding is done on annually basis.

- If the annual interest rate is 5%
- If the annual interest rate is 10%
- If the annual interest rate is 15%

**EX6**

- You buy a smart phone for \$1,100 but you don't have to make the payment until next year (it means, one year later). Suppose the interest rate is 5%, compounded annually. What is the amount of money that you have to save at the present to pay for the smart phone?
- If the year of payment is deferred for 2 more years. What is the amount of money that you have to save at the present to pay for the smart phone?

**EX7:** You has won the prize of \$100,000 to be paid the whole amount after 3 years. At the same time, you receive an offer of \$80,000 to sell the right of receiving that prize. If the market interest rate is 12% and the interest is compounded annually. Whether the offer should be accepted or not?

**EX8:** Mr. Anh is planning to invest in a project that costs \$9mil. The project is expected to have a life of 4 years. The cash flows expected to receive at the end of each year are 0; \$3mil; \$3mil; \$5mil, respectively. Know that annual interest rate is 10%.

- What is the present value of the uneven cash flows?
- Should Mr. Anh invest in the project?

**EX9:** Ms. Mai plans to deposit some amounts of money of \$500, \$800, \$700 at the beginning of each year. Know that the annual interest rate is 10%.

- a) How much money will Ms. Mai receive at the end of year 3?
- b) If Ms. Mai deposits money at the end of each year. How much money will she receive at the end of year 3?

**EX10:** What is the present value of the following cash flows? Knowing that the discount rate is 7%.

Year	Cash flow
1	\$3,000
2	0
3	- \$4,000
4	\$2,000

**EX11:**

Suppose that your farm land brings an amount of \$40 million every end of the year forever, the annual interest rate is 10%.

- a) What is the present value of the perpetuity?
- b) If you receive the income at the beginning of the year. What is the present value of the perpetuity?

**EX12:**

Suppose that your farm land brings an amount of \$40 million every end of the year forever and it grows by 5% per year, the annual interest rate is 10%.

- a) What is the present value of the perpetuity?
- b) If you receive the income at the beginning of the year. What is the present value of the perpetuity?

**EX13:**

What price would you be willing to pay for a preferred share of stock in the ABC corporation, that promises to pay a cash dividend to you at the end of the year of \$25, which will increase every year by 1%, forever. Know that the interest rate is 4.75%?

**EX14:**

- a) What is the present value of \$1 billion every year, for all eternity, if you estimate the perpetual discount rate to be 10%?
- b) What if the investment does not start making money for 3 years?

**EX15:** Ms. Mai plans to deposit the same amounts of money of \$100 at the beginning of each 3 year, starting from year 1. Know that the annual interest rate is 15%.

- a) How much money will Ms. Mai receive at the end of year 3?
- b) If Ms. Mai deposits money at the end of each year. How much money will she receive at the end of year 3?

**EX16:** You agree to lease a car for 4 years at \$300 per month. You are not required to pay any money up front or at the end of your agreement. If your opportunity cost of capital is 0.5% per month, what is the cost of the lease?

**EX17:** The state lottery advertises a jackpot prize of \$295.7 million, paid in 25 installments over 25 years, at the beginning of each year. If interest rates are 5.9% what is the true value of the lottery prize?

**EX18:** Ms. Oanh has to pay school fee of \$12,500 at the end of the next 6 years. Know that the compounding annual interest rate is 8%.

- a) How much should she set aside today to cover these amounts?
- b) If she has \$70,476 today. How much remaining money will she have after paying all school fees?

**EX19:** What is the future value of \$20,000 paid at the end of each of the following 5 years, assuming your investment returns 8% per year?

**EX20:** An investment produces an income that grows by 4% each next 7 years. If the first year's income is \$10,000 and interest rate is 11%, what is the present value of the investment?

**EX21:** Given a monthly rate of 1%, what is the Effective Annual Rate (EAR)? What is the Annual Percentage Rate (APR)?

**EX22:** Given the 10.25% EAR compounded monthly. What is the Annual Percentage Rate (APR)?

### CHAPTER 3: VALUING BONDS

**EX1:** What is the price of a 10-year annual coupon bond that has a coupon rate of 9% with a face value of \$1,000. Know that:

Yield to maturity is 5%

Yield to maturity is 9%

Yield to maturity is 12%

**EX2:** What is the price of a bond that has a coupon rate of 4% with a face value of \$1,000 and pays interest semi-annually? Know that it matures exactly 3 years from today and a yield to maturity is 7%.

**EX3:** A \$1,000 treasury bond expires in 5 years. It pays a coupon rate of 10.5%. If the market price of this bond is \$1,078.8, what is the yield to maturity?

**EX4:**

What is the price of a 3-year annual coupon bond that has a coupon rate of 3.25% with a face value of \$1,000, if:

- a) Yield to maturity is 4%
- b) Yield to maturity is 6%

Calculate the change in bond price when yield to maturity increases from 4% to 6%.

**EX5:** What is the price of a 30-year annual coupon bond that has a coupon rate of 3.25% with a face value of \$1,000, if:

- a) Yield to maturity is 4%
- b) Yield to maturity is 6%

Calculate the change in bond price when yield to maturity increases from 4% to 6%.

**EX6:** What is the duration of a bond with 5 years till maturity and a 7% coupon rate with a face value of \$1,000. Given that yield to maturity is 8%.

**EX7:** What is the duration of a zero-coupon bond with a face value of \$1,000. Know that the maturity is 5 years and the yield to maturity is 8%.

**EX8:** Given a bond with 5 years till maturity and a 7% coupon rate with a face value of \$1,000. Know that yield to maturity is 8%.

- a) Calculate modified duration of a bond
- b) If yield to maturity increases from 8% to 9%, what is the price of bond after yield to maturity changes

**EX9:** A bond has a face value of \$1,000, maturity is 5 years, coupon rate is 12%, YTM is 14%.

- a) Calculate the price of the bond?
- b) Calculate the duration of the bond?
- c) Calculate the modified duration of the bond? What does the modified duration imply?

## **CHAPTER 4: THE VALUE OF COMMON STOCKS**

**EX1:** A firm has 100 outstanding common stocks selling at \$60 per share. What is the firm's market capitalization?

**EX2:** ABC Company is expected to pay a dividend of \$1.5 per share. Knowing that the current stock price is \$46 and the P/E is 10.2. Calculate the plowing back ratio.

**EX3:** A firm has an income statement of 2022 as below. The firm has 100 outstanding common stocks selling at \$60 per share. Calculate Earnings per Share and P/E ratio.

	2022
Revenue	\$725
Cost of good sold	\$390
Selling, general, and administrative expenses	\$121
Depreciation	\$80
Earnings before interest and tax	?
Interest payment	\$37
Earnings before tax	?
Tax (20%)	?
Net income	?

**EX4:** Company A is expected to pay a dividend of \$5 per share next year and stock A is expected to sell for \$110 one year from now. If the required rate on the stock is 15%, what is the current price of the stock?

**EX5:** Company A is expected to pay dividend of \$5 and \$5.5 per share over the next 2 years, respectively. At the end of year two, the stock will be sold for \$121. If the required rate on the stock is 15%, what is the current price of the stock?

**EX6:** Company A is expected to pay dividend of \$3 at the end of year one. The dividend is expected to grow 5% each year until year three. At the end of year three, the stock will be sold for \$134. If the required rate on the stock is 12%, what is the current price of the stock?

**EX7:** Company A is expected to pay dividend of \$10 a share forever. If the required rate on the stock is 7%, what is the current price of the stock?

**EX8:** Company B is expected to pay a dividend of \$5 next year. Thereafter, dividend growth is expected to be 4% a year forever. If the required rate on the stock is 7%, what is the current price of the stock?

**EX9:** Company C is expected to pay a dividend of \$5 next year. Thereafter, dividend growth is expected to be 10% a year for 2 years and 3% thereafter. If the required rate on the stock is 7%, what is the current price of the stock?

**EX10:** Northwest Natural Gas stock was selling for \$42.45 per share at the start of 2009. Dividend payments for the next year were expected to be \$1.68 a share. What is the dividend yield and required return, assuming no growth?

**EX11:** Northwest Natural Gas stock was selling for \$42.45 per share at the start of 2009. Dividend payments for the next year were expected to be \$1.68 a share. What is the dividend yield and required return, assuming a growth rate of 6.1%?

**EX12:** Northwest Natural Gas just reported earnings of \$2 million and decided to pay out 60% of its earnings as dividends. The book value of equity is \$10 million. What is the dividend growth rate of the firm?