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CHAPTER 2:
FINANCIAL MARKETS, ASSET CLASSES, AND FINANCIAL INSTRUMENTS

PROBLEM SETS:

1. Money market securities are called "cash equivalents" because of their great liquidity. The prices of money market securities are very stable, and they can be converted to cash (i.e., sold) on very short notice and with very low transaction costs.

2. a. $r_{BEY} = \frac{10{,}000-P}{P} \times \frac{365}{n}$

$$r_{BEY} = \frac{10{,}000-9{,}600}{9600} \times \frac{365}{182} = .083562, or\ 8.36\%$$

b. One reason is that the discount yield is computed by dividing the dollar discount from par by the par value, $10,000, rather than by the bill's price, $9,600. A second reason is that the discount yield is annualized by a 360-day rather than a 365-day year.

3. $P = \$1{,}000\ [1 - r_{BD}\ (n/360)]$ where r_{BD} is the discount yield.

$P_{ask} = \$1{,}000[1 - .0681(60/360)] = \$988.65$

$P_{bid} = \$1{,}000\ [1 - .0690(60/360)] = \$988.50$

4. $$r_{BEY} = \frac{1{,}000 - P}{P} \times \frac{365}{n}$$

$$= \frac{1{,}000 - 988.65}{988.65} \times \frac{365}{60} = 6.98\%,$$

which exceeds the discount yield, $r_{BD} = 6.81\%$.

To obtain the effective annual yield, r_{EAY}, note that the 60-day growth factor for invested funds is $\frac{1{,}000}{988.65} = 1.01148$. Annualizing this growth rate results in

$1 + r_{EAY} = \left(\frac{1{,}000}{988.65}\right)^{365/60} = 1.0719$ which implies that $r_{EAY} = 7.19\%$.

5. According to equation 2.2:

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$P = \$10{,}000/[1 + r_{BEY} \times (n/365)]$

$P = \$10{,}000/[1 + 0.05 \times (91/365)] = \$\ 9{,}876.88.$

6. a. i. $1 + r = (\$10{,}000/\$9{,}764)^{4} = 1.1002$

$r = 10.02\%$

ii. $1 + r = (\$10{,}000/\$9{,}539)^{2} = 1.0990$

$r = 9.90\%$

The three-month bill offers a higher effective annual yield.

b. i. $r_{BD} = \dfrac{1{,}000 - 976.4}{1{,}000} \times \dfrac{360}{91} = 0.0934 = 9.34\%$

ii. $r_{BD} = \dfrac{1{,}000 - 953.9}{1{,}000} \times \dfrac{360}{182} = 0.0912 = 9.12\%$

7. a. Price $= \$1{,}000 \times \left[1 - 0.03 \times \dfrac{90}{360}\right] = \$992.5$

b. 90-day return $= \dfrac{1{,}000 - 992.5}{992.5} = 0.007557 = 0.7557\%$

c. $r_{BEY} = 0.7557\% \times \dfrac{365}{90} = 3.06\%$

d. Effective annual yield $= (1.007557)^{365/90} - 1 = 0.0310 = 3.10\%$

8. The bill has a maturity of one half-year, and an annualized discount of 9.18%. Therefore, its actual percentage discount from par value is $9.18\% \times 1/2 = 4.59\%$. The bill will sell for $\$100{,}000 \times (1 - 0.0459) = \$95{,}410$.

9. The total before-tax income is \$4. Since the dividend income is fully excluded from taxable income, the after-tax income is also \$4, for a rate of return of 10%.

10. a. The index at $t = 0$ is $(\$60 + \$80 + \$20)/3 = \$53.33$. At $t = 1$, it is $(\$70 + \$70 + \$25)/3 = \$55$, for a rate of return of 3.13%.

b.

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Stock	Q	P_0	Market Value	P_1	Market Value
A	200	$60	$12,000	$70	$14,000
B	500	$80	$40,000	$70	$35,000
C	600	$20	$12,000	$25	$15,000

The index at $t = 0$ is ($12,000 + $40,000 + $12,000)/100 = 640. At $t = 1$, it is also 640, so the rate of return is zero.

c.

	Before Splits		After Splits		
Stock	P_0	Q	P_0	Q	P_1
A	$60	200	$30	400	$35
B	$80	500	$20	2,000	$17.5
C	$20	600	$20	600	$25

After the splits the index has to remain unchanged so the divisor (which initially was 3) has to be reset. The sum of the three prices after the split is 70, while the index value before splits was 53.33. Therefore $70/$d$ = 53.33 and the new divisor must be 1.3125. The index at $t = 1$ is ($35 + $17.5 + $25)/1.3125 = 59.05 for a return of 10.71%.

d. The total market value of *A* and *B* as well as that of the market remain unchanged after the two splits so that the return on the value-weighted index is not affected by the splits (and it is zero).

11. a. The index at $t = 0$ is ($90 + $50 + $100)/3 = 80. At $t = 1$, it is $250/3 = 83.333, for a rate of return of 4.17%.

b. In the absence of a split, stock *C* would sell for 110, and the index would be 250/3 = 83.333. After the split, stock *C* sells at 55. Therefore, we need to set the divisor d such that 83.333 = (95 + 45 + 55)/d, meaning that $d = 2.34$.

c. The return is zero. The index remains unchanged, as it should, since the return on each stock separately equals zero.

12. a. Total market value at $t = 0$ is ($9,000 + $10,000 + $20,000) = $39,000. Market value at $t = 1$ is ($9,500 + $9,000 + $22,000) = 40,500. Rate of return = $40,500/$39,000 – 1 = 3.85%.

b. The return on each stock is as follows:

$r_A = 95/90 - 1 = 0.0556$

$r_B = 45/50 - 1 = -0.10$

$r_C = 110/100 - 1 = 0.10$

The equally-weighted average is 0.0185 = 1.85%

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13. a. The higher coupon bond.
    b. The call with the lower exercise price.
    c. The put on the lower priced stock.
    d. The bill with the lower yield.

14. Preferred stock is like a long-term debt in which it typically promises a fixed payment each year. In this way, it is a perpetuity. Preferred stock, also, does not give the holder voting rights in the firm.

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Preferred stock is like equity in which the firm is under no contractual obligation to make the preferred stock dividend payments. Failure to make payments does not set off corporate bankruptcy. With respect to the priority of claims to the assets of the firm in the event of corporate bankruptcy, preferred stock has a higher priority than common equity but a lower priority than bonds.

15.

	Value of call at expiration	–	Initial cost	=	Profit
a.	$0		$4		$–4
b.	$0		$4		$–4
c.	$0		$4		$–4
d.	$5		$4		$ 1
e.	$10		$4		$ 6

	Value of put at expiration	–	Initial cost	=	Profit
a.	$10		$6		$ 4
b.	$5		$6		$–1
c.	$0		$6		$–6
d.	$0		$6		$–6
e.	$0		$6		$–6

16. There is always a chance that the option will be in the money at some point prior to expiration. Investors will pay something for this chance of a positive payoff.

17. A call option conveys the *right* to buy the underlying asset at the exercise price. A long position in a futures contract carries an *obligation* to buy the underlying asset at the futures price.

18. A put option conveys the *right* to sell the underlying asset at the exercise price. A short position in a futures contract carries an *obligation* to buy the underlying asset at the futures price.

19. Individual response. However, on the day that we tried this experiment, 18 of the 25 stocks met this criterion, leading us to conclude that returns on stock investments can be quite volatile.

20. The spread will widen. Deterioration of the economy increases credit risk, that is, the likelihood of default. Investors will demand a greater premium on debt securities subject to default risk.

21. a. Because the stock price exceeds the exercise price, you will choose to exercise. The payoff on the option will be $41 – $39 = $2. The option originally cost $1.35, so the gain is $2.00 – $1.35 = $0.65. Since the contracts are for 100 shares, your gain is $65.00.

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b. If the exercise price were $40, and the stock price $39, you would not exercise. The loss on the call would be the initial cost, which was $0.59. Your total loss is therefore $59.00.

c. If the put has an exercise price of $42, you would not exercise for any stock price of $42 or above. The loss on the put would be the initial cost, which was $1.88*100=$188.00. With a share price of $40, the put would be exercised for a gain of $2 ($42 – $40) which would give a profit of $12.00 (($2 gain – $1.88 cost)*100).

22. a. Aecon closed at $17.81.

b. Assuming that you buy at the closing price, you could buy $5,000/$17.81 = 280 shares.

c. The dividend is 2.8% of $17.81, which is probably an annual amount of $.50; your dividend income would be 280 × $ .50 = $140 annually.

d. The price-to-earnings ratio is 25.8, and price is $17.81. Therefore,

Earnings (E.P.S.) = $17.81/25.8 $\Rightarrow$ E.P.S. = $0.69

23. a. You bought the contract when the futures price was 885.5 (see Figure 2.12). The contract closes at a price of $900, which is $14.5 higher than the original futures price. The contract multiplier is 200. Therefore, you will incur a gain of $14.5 × 200 = $2,900.

b. Open interest on the index is 240,890 contracts.

24. d

25. a. Writing a call entails unlimited potential losses as the stock price rises.

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CHAPTER TWO
ASSET CLASSES AND FINANCIAL INSTRUMENTS

CHAPTER OVERVIEW

This chapter describes the financial instruments traded in the primary and secondary markets. The chapter provides an overview of overview discussion of money market, capital market instruments and derivative securities. The various market indices that are used as indicators of "the market" are also described. The chapter concludes with a discussion of options and futures markets

LEARNING OBJECTIVES

Upon completion of this chapter the student should have a thorough understanding of the various financial instruments available to the potential investor. The student should have an insight as to the interpretation, composition, and calculation process involved in the various market indexes presented on the evening news. The student should have some understanding of the basics of options and futures contracts.

PRESENTATION OF MATERIAL

2.1 The Money Market

The major money market instruments are presented here. In describing the individual instruments, it is helpful for the students' understanding of the market to integrate discussion of institutional characteristics of the instruments. For example, commercial banks are the major participants for many of the instruments. The text presents a thorough discussion of the calculation of money market instrument yields. If students have adequate backgrounds from prerequisite classes, discussion of characteristics of marketability, liquidity, and default risk may be appropriate. Discussion of the concepts should be delayed to later chapters if students' backgrounds are not adequate.

2.2 The Bond Market

Debt instruments are issued by both public and private entities. The treasury issues have the direct or implied guarantee of the federal government. Provincial and municipal entities also issue bonds, but performance on these bonds does not have the same degree of safety. The Treasury and Agency issues have the direct or implied guaranty of the federal government. Since state and local entities issue municipal bonds, performance on these bonds does not have the same degree of safety. Since the interest income on municipal bonds is not subject to federal taxes, the taxable equivalent yield is used for comparison.

Key characteristics of Government of Canada. Notes and Bonds are described here. Debt of provincial government l agencies has also become a significant component of the debt market. Major issuers of agency debt are described. Municipal bonds issued by cities, municipalities, or counties to finance local capital expenditures such as the construction of bridges, highways, airports, or schools. They represent a smaller component of the Canadian fixed income market than the US market This is in part due to the differential tax treatment: in the US, interest income on most municipal bonds is not subject to taxes. In the US, to compare the yield on municipals with other taxable securities the taxable equivalent yield is used. In Canada, municipal bond interest is fully taxable, and this "comparative' yield adjustment is not necessary. Municipal bonds can be general obligation bonds or revenue bonds. General obligation bonds

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are considered less risky since they are backed by the full taxing power of the government entity. Revenue from specific projects is dedicated to revenue bonds. Bonds issued by private corporations are subject to greater default risk than bonds issued by government entities. Corporate bonds often contain imbedded options such as the call feature which allows an existing corporation to repurchase the bond from issuers when rates have fallen. Bonds backed by mortgages have grown to compose a major element of the bond market. Such bonds can represent proportional shares of a pool of mortgages or specific portion of a pool of mortgages. The mortgage backed market has grown rapidly in recent years.

2.3. Equity Securities

Two key points are relevant in the discussion of equity instruments. First, it should be emphasized that with the issue of common stock owners having a residual claim to the earnings of the firm. The priorities of debt holders and preferred stockholders are contrasted with common shareholders. Second, the differences in preferred stock and common stock dividends should be emphasized. Preferred shareholders have a priority claim to income in the form of dividends. Preferred stockholders are limited to the fixed dividend while common shareholders do not have limits. The partial tax exemption on dividends of one corporation being received by another corporation is important in discussing preferred stock. A brief discussion on depository receipts can introduce international investing to the students.

2.4 Stock and Bond Market Indexes

The uses of stock indexes provide a good starting point for the discussion of the structure and construction of stock indexes. Motivational factors include tracking average returns, making comparisons of managers' performance to average performance and, increasingly, indexes are used as a base for derivative instruments. Discussion of the factors in constructing or using an index focuses the students' attention on key differences in the indexes. The samples of indexes fits well with discussion of uses of the index. If the index were going to be used to assess the performance of a manager that invests in Small-Cap firms, the TSX 60 would not be as appropriate of benchmark as the TSX Small Cap Index. A key US benchmark, the DJIA which captures the returns from the bluest of blue chips, is also introduced.. Tables Examples 2.2 and 2.4 provides a useful ways to introduce the construction of an index. .Example 2.2 shows the basics in the construction of a price-weighted index. Example 2.4 shows the contrast between a market-value-weighted index vs. a price-weighted average index. The examples of market-value indexes used in the text shows their diversity. Many important broad based indexes, such as the S&P/TSX Composite Index and the S&P 500 are value-weighted. A third possibility is equal weighting. While this method is not too commonly observed in published indexes, it is commonly used in research, especially for tests that want to provide more weight to smaller firms.

The international indexes represent the most popular indexes used by investors. They include only a small example of what it available but they are representative of the major types of indexes and major countries. The text has several examples of greater detail in several exhibits.

2.5 Derivative Markets

Basic positions and terms for options and futures are described here. The basic positions and terms are used to contrast the differences in futures and options. The essential difference is that while an option confers the right but not the requirement to exercise, a futures contract represents a firm commitment to buy or sell for future delivery. The text provides discussion of options for individual stocks and on agricultural futures contracts. The extension to discussion of other assets enhances understanding of the uses and differences of options and futures.

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