CHAPTER 2: ASSET CLASSES AND FINANCIAL INSTRUMENTS

PROBLEM SETS

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

   Preferred stock is like equity in that 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.

2. Money market securities are called *cash equivalents* because of their high level of 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. Examples of money market securities include Treasury bills, commercial paper, and banker's acceptances, each of which is highly marketable and traded in the secondary market.

3. (a) A repurchase agreement is an agreement whereby the seller of a security agrees to “repurchase” it from the buyer on an agreed upon date at an agreed upon price. Repos are typically used by securities dealers as a means for obtaining funds to purchase securities.

4. Spreads between risky commercial paper and risk-free government securities will widen. Deterioration of the economy increases the likelihood of default on commercial paper, making them more risky. Investors will demand a greater premium on all risky debt securities, not just commercial paper.

5.

	Corp. Bonds	Preferred Stock	Common Stock
Voting rights (typically)			Yes
contractual obligation	Yes		
Perpetual payments		Yes	Yes
Accumulated dividends		Yes	
Fixed payments (typically)	Yes	Yes	
Payment preference	First	Second	Third

6. Municipal bond interest is tax-exempt at the federal level and possibly at the state level as well. When facing higher marginal tax rates, a high-income investor would be more inclined to invest in tax-exempt securities.

7. a. You would have to pay the ask price of:

   161.1875% of par value of $1,000 = $1611.875

   b. The coupon rate is 6.25% implying coupon payments of $62.50 annually or, more precisely, $31.25 semiannually.

   c. The yield to maturity on a fixed income security is also known as its required return and is reported by *The Wall Street Journal* and others in the financial press as the ask yield. In this case, the yield to maturity is 2.113%. An investor buying this security today and holding it until it matures will earn an annual return of 2.113%. Students will learn in a later chapter how to compute both the price and the yield to maturity with a financial calculator.

8. Treasury bills are discount securities that mature for $10,000. Therefore, a specific T-bill price is simply the maturity value divided by one plus the semi-annual return:

   P = $10,000/1.045 = $9,569.38

9. The total before-tax income is $7. After the 70% exclusion for preferred stock dividends, the taxable income is: 0.30 × $7 = $2.10

   Therefore, taxes are: 0.30 × $2.10 = $0.63

   After-tax income is: $7.00 – $0.63 = $6.37

   Rate of return is: $6.37/$35.00 = 18.2%

10. a. You could buy: $5,000/$64.69 = 77.29 shares. Since it is not possible to trade in fractions of shares, you could buy 77 shares of GD.

   b. Your annual dividend income would be: 77 × $2.04 = $157.08

   c. The price-to-earnings ratio is 9.31 and the price is $64.69. Therefore:

   $64.69/Earnings per share = 9.3 ⇒ Earnings per share = $6.96

   d. General Dynamics closed today at $64.69, which was $0.65 higher than yesterday's price of $64.04

11. a. At $t = 0$, the value of the index is: (50 + 105 + 85)/3 = 80

At $t = 1$, the value of the index is: (55 + 100 + 90)/3 = 81.667

The rate of return is: (81.667/80) – 1 = 2.08%

b. In the absence of a split, Stock C would sell for 110, so the value of the index would be: 245/3 = 81.666 with a divisor of 3.

After the split, stock C sells for 45. Therefore, we need to find the divisor (d) such that: $81.667 = (55 + 100 + 45)/d \Rightarrow d = 2.449$. The divisor fell, which is always the case after one of the firms in an index splits its shares.

c. The return is zero. The index remains unchanged because the return for each stock separately equals zero.

12. a. Total market value at $t = 0$ is: ($9,000 + $10,000 + $20,000) = $39,000

Total 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:

[0.0556 + (-0.10) + 0.10]/3 = 0.0185 = 1.85%

13. The after-tax yield on the corporate bonds is: $0.05 \times (1 - 0.30) = 0.035 = 3.50\%$ Therefore, municipals must offer a yield to maturity of at least 3.50%.

14. Equation (2.2) shows that the equivalent taxable yield is: $r = r_m /(1 - t)$, so simply substitute each tax rate in the denominator to obtain the following:

a. 10.00%

b. 11.11%

c. 12.5%

d. 14.29%

15. In an equally weighted index fund, each stock is given equal weight regardless of its market capitalization. Smaller cap stocks will have the same weight as larger cap stocks. The challenges are as follows:
    - Given equal weights placed to smaller cap and larger cap, equal-weighted indices (EWI) will tend to be more volatile than their market-capitalization counterparts;
    - It follows that EWIs are not good reflectors of the broad market that they represent; EWIs underplay the economic importance of larger companies.
    - Turnover rates will tend to be higher, as an EWI must be rebalanced back to its original target. By design, many of the transactions would be among the smaller, less-liquid stocks.

16. a. The ten-year Treasury bond with the higher coupon rate will sell for a higher price because its bondholder receives higher interest payments.

    b. The call option with the lower exercise price has more value than one with a higher exercise price.

    c. The put option written on the lower priced stock has more value than one written on a higher priced stock.

17. a. You bought the contract when the futures price was $7.8325 (see Figure

    2.11 and remember that the number to the right of the apostrophe represents an eighth of a cent). The contract closes at a price of $7.8725, which is $0.04 more than the original futures price. The contract multiplier is 5000. Therefore, the gain will be: $\$0.04 \times 5000 = \$200.00$

    b. Open interest is 135,778 contracts.

18. a. Owning the call option gives you the right, but not the obligation, to buy at $180, while the stock is trading in the secondary market at $193. Since the stock price exceeds the exercise price, you exercise the call.

    The payoff on the option will be: $193 - $180 = $13

    The cost was originally $12.58, so the profit is: $13 - $12.58 = $0.42

    b. Since the stock price is greater than the exercise price, you will exercise the call. The payoff on the option will be: $193 - $185 = $8

    The option originally cost $9.75, so the profit is $8 - $9.75 = -$1.75

    c. Owning the put option gives you the right, but not the obligation, to sell at $185, but you could sell in the secondary market for $193, so there is no value in exercising the option. Since the stock price is greater than the exercise price, you will not exercise the put. The loss on the put will be the initial cost of $12.01.

19. There is always a possibility that the option will be in-the-money at some time prior to expiration. Investors will pay something for this possibility of a positive payoff.

20.

	Value of Call at Expiration	Initial Cost	Profit
a.	5	5	0
b.	10	5	5
c.	15	5	10
d.	20	5	15
e.	25	5	20

	Value of Put at Expiration	Initial Cost	Profit
a.	0	7.5	-7.5
b.	0	7.5	-7.5
c.	0	7.5	-7.5
d.	0	7.5	-7.5
e.	0	7.5	-7.5

21. 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 sell the underlying asset at the futures price. Both positions, however, benefit if the price of the underlying asset falls.

22. 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. Both positions, however, benefit if the price of the underlying asset rises.

CFA PROBLEMS

1. (d) There are tax advantages for corporations that own preferred shares.

2. The equivalent taxable yield is: $6.75\%/(1 - 0.34) = 10.23\%$

3. (a) Writing a call entails unlimited potential losses as the stock price rises.

4. a. The taxable bond. With a zero tax bracket, the after-tax yield for the taxable bond is the same as the before-tax yield (5%), which is greater than the yield on the municipal bond.

   b. The taxable bond. The after-tax yield for the taxable bond is:
   $0.05 \times (1 – 0.10) = 4.5\%$

   c. You are indifferent. The after-tax yield for the taxable bond is:

   $0.05 \times (1 – 0.20) = 4.0\%$

   The after-tax yield is the same as that of the municipal bond.

   d. The municipal bond offers the higher after-tax yield for investors in tax brackets above 20%.

5. If the after-tax yields are equal, then: $0.056 = 0.08 \times (1 – t)$

   This implies that $t = 0.30 = 30\%$.