CHAPTER 2: ASSET CLASSES AND FINANCIAL INSTRUMENTS

PROBLEM SETS

2. 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.

10. a. You could buy: \$5,000/\$67.32 = 74.27 shares

    b. Your annual dividend income would be: 74.27 × \$1.52 = \$112.89

    c. The price-to-earnings ratio is 11 and the price is \$67.32. Therefore:

    \$67.32/Earnings per share = 11 Þ Earnings per share = \$6.12

    d. General Dynamics closed today at \$67.32, which was \$0.47 higher than yesterday's price. Yesterday's closing price was: \$66.85

13. The after-tax yield on the corporate bonds is: 0.09 × (1 – 0.30) = 0.0630 = 6.30%
Therefore, municipals must offer at least 6.30% yields.

CFA PROBLEMS

1. (d)

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

CHAPTER 3: HOW SECURITIES ARE TRADED

PROBLEM SETS

4. (a) A market order is an order to execute the trade immediately at the best possible price. The emphasis in a market order is the speed of execution (the reduction of execution uncertainty). The disadvantage of a market order is that the price it will be executed at is not known ahead of time; it thus has price uncertainty.

8. a. The buy order will be filled at the best limit-sell order price: $50.25

   b. The next market buy order will be filled at the next-best limit-sell order price: $51.50

   c. You would want to increase your inventory. There is considerable buying demand at prices just below $50, indicating that downside risk is limited. In contrast, limit sell orders are sparse, indicating that a moderate buy order could result in a substantial price increase.

14. a. $55.50

   b. $55.25

   c. The trade will not be executed because the bid price is lower than the price specified in the limit sell order.

   d. The trade will not be executed because the asked price is greater than the price specified in the limit buy order.

CFA PROBLEMS

2. (d) The broker will sell, at current market price, after the first transaction at $55 or less.

3. (d)

CHAPTER 4: MUTUAL FUNDS AND OTHER INVESTMENT COMPANIES

PROBLEM SETS

1. The unit investment trust should have lower operating expenses. Because the investment trust portfolio is fixed once the trust is established, it does not have to pay portfolio managers to constantly monitor and rebalance the portfolio as perceived needs or opportunities change. Because the portfolio is fixed, the unit investment trust also incurs virtually no trading costs.

6. Advantages of an ETF over a mutual fund:

   - ETFs are continuously traded and can be sold or purchased on margin
   - There are no Capital Gains Tax triggers when an ETF is sold (shares are just sold from one investor to another)
   - Investors buy from Brokers, thus eliminating the cost of direct marketing to individual small investors. This implies lower management fees

   Disadvantages of an ETF over a mutual fund:

   - Prices can depart from NAV (unlike an open-end fund)
   - There is a Broker fee when buying and selling (unlike a no-load fund)

7. The offering price includes a 6% front-end load, or sales commission, meaning that every dollar paid results in only \$0.94 going toward purchase of shares. Therefore:

$$\text{Offering price} = \frac{\text{NAV}}{1 - \text{load}} = \frac{\$10.70}{1 - 0.06} = \$11.38$$

9.

Stock	Value held by fund
A	\$ 7,000,000
B	12,000,000
C	8,000,000
D	15,000,000
Total	\$42,000,000

$$\text{Net asset value} = \frac{\$42{,}000{,}000 - \$30{,}000}{4{,}000{,}000} = \$10.49$$

18. As an initial approximation, your return equals the return on the shares minus the total of the expense ratio and purchase costs: 12% – 1.2% – 4% = 6.8%

But the precise return is less than this because the 4% load is paid up front, not at the end of the year.

To purchase the shares, you would have had to invest: $20,000/(1 – 0.04) = $20,833

The shares increase in value from $20,000 to: $20,000 × (1.12 – 0.012) = $22,160

The rate of return is: ($22,160 – $20,833)/$20,833 = 6.37%

CHAPTER 6: RISK AVERSION AND CAPITAL ALLOCATION TO RISKY ASSETS

PROBLEM SETS

2. (b) A higher borrowing rate is a consequence of the risk of the borrowers' default. In perfect markets with no additional cost of default, this increment would equal the value of the borrower's option to default, and the Sharpe measure, with appropriate treatment of the default option, would be the same. However, in reality there are costs to default so that this part of the increment lowers the Sharpe ratio. Also, notice that answer (c) is not correct because doubling the expected return with a fixed risk-free rate will more than double the risk premium and the Sharpe ratio.

3. Assuming no change in risk tolerance, that is, an unchanged risk aversion coefficient (A), then higher perceived volatility increases the denominator of the equation for the optimal investment in the risky portfolio (Equation 6.7). The proportion invested in the risky portfolio will therefore decrease.

5. When we specify utility by $U = E(r) - 0.5A\sigma^2$, the utility level for T-bills is: 0.07

   The utility level for the risky portfolio is:

   $$U = 0.12 - 0.5 \times A \times (0.18)^2 = 0.12 - 0.0162 \times A$$

   In order for the risky portfolio to be preferred to bills, the following must hold:

   $$0.12 - 0.0162A > 0.07 \Rightarrow A < 0.05/0.0162 = 3.09$$

   A must be less than 3.09 for the risky portfolio to be preferred to bills.

10. The portfolio expected return and variance are computed as follows:

(1) W_{Bills}	(2) r_{Bills}	(3) W_{Index}	(4) r_{Index}	$r_{Portfolio}$ (1)×(2)+(3)×(4)	$\sigma_{Portfolio}$ (3) × 20%	$\sigma^2_{Portfolio}$
0.0	5%	1.0	13.0%	13.0% = 0.130	20% = 0.20	0.0400
0.2	5%	0.8	13.0%	11.4% = 0.114	16% = 0.16	0.0256
0.4	5%	0.6	13.0%	9.8% = 0.098	12% = 0.12	0.0144
0.6	5%	0.4	13.0%	8.2% = 0.082	8% = 0.08	0.0064
0.8	5%	0.2	13.0%	6.6% = 0.066	4% = 0.04	0.0016
1.0	5%	0.0	13.0%	5.0% = 0.050	0% = 0.00	0.0000

11. Computing utility from $U = E(r) - 0.5 \times A\sigma^2 = E(r) - \sigma^2$, we arrive at the values in the column labeled U(A = 2) in the following table:

W_{Bills}	W_{Index}	$r_{Portfolio}$	$\sigma_{Portfolio}$	$\sigma^2_{Portfolio}$	U(A = 2)	U(A = 3)
0.0	1.0	0.130	0.20	0.0400	0.0900	.0700
0.2	0.8	0.114	0.16	0.0256	0.0884	.0756
0.4	0.6	0.098	0.12	0.0144	0.0836	.0764
0.6	0.4	0.082	0.08	0.0064	0.0756	.0724
0.8	0.2	0.066	0.04	0.0016	0.0644	.0636
1.0	0.0	0.050	0.00	0.0000	0.0500	.0500

The column labeled U(A = 2) implies that investors with A = 2 prefer a portfolio that is invested 100% in the market index to any of the other portfolios in the table.

13. Expected return = $(0.7 \times 18\%) + (0.3 \times 8\%) = 15\%$

Standard deviation = $0.7 \times 28\% = 19.6\%$

17. a. $E(r_C) = r_f + y \times [E(r_P) - r_f] = 8 + y \times (18 - 8)$

If the expected return for the portfolio is 16%, then:

$$16\% = 8\% + 10\% \times y \Rightarrow y = \frac{.16 - .08}{.10} = 0.8$$

Therefore, in order to have a portfolio with expected rate of return equal to 16%, the client must invest 80% of total funds in the risky portfolio and 20% in T-bills.

b.

Client's investment proportions:
20.0% in T-bills
$0.8 \times 25\% =$ 20.0% in Stock A
$0.8 \times 32\% =$ 25.6% in Stock B
$0.8 \times 43\% =$ 34.4% in Stock C

c. $\sigma_C = 0.8 \times \sigma_P = 0.8 \times 28\% = 22.4\%$

CFA PROBLEMS

3. (b)

8. Expected return for equity fund = T-bill rate + risk premium = 6% + 10% = 16%
   Expected rate of return of the client's portfolio = (0.6 × 16%) + (0.4 × 6%) = 12%
   Expected return of the client's portfolio = 0.12 × $100,000 = $12,000
   (which implies expected total wealth at the end of the period = $112,000)
   Standard deviation of client's overall portfolio = 0.6 × 14% = 8.4%

9. Reward-to-volatility ratio = $\frac{.10}{.14} = 0.71$