CHAPTER 6. INVESTMENT COMPANIES: MUTUAL FUNDS

PROBLEMS

1. What is the net asset value of an investment company with $10,000,000 in assets, $500,000 in current liabilities, and 1,000,000 shares outstanding?

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Assets              $10,000,000
Liabilities             500,000
Equity              $ 9,500,000
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Net asset value (per share): $9,500,000/1,000,000 = $9.50

2. If a mutual fund's net asset value is $30.00 and the fund sells its shares for $31.00, what is the load fee as a percentage of the net asset value?

Load fee: $31– $30 = $1

Load fee as a percent of net asset value:
   $1/$30 = 3.3333%

3. If an investor buys shares in a no-load mutual fund for $30.00 and the shares appreciate to $36.00 in a year, what would be the percentage return on the investment? If the fund charges an exit fee of 1 percent, what would be the return on the investment?

The investor earned $6 on an investment of $30 for a percentage gain of 20%. The exit fee reduces the terminal value by $0.36 to $35.64, so the net gain is $5.64, and the percentage return 18.8%. Notice that the 1 percent exit fee applies to the total value and not the gain so that the percentage increase is reduced by more than 1 percent.

4. An investor buys shares in a mutual fund for $20 per share. At the end of the year the fund distributes a dividend of $2.00, and after the distribution the net asset value of a share is $22.00. What would be the investor's percentage return on the investment?

The investor received $2.00 and experienced appreciation of $2 ($22–$20) for a total gain of $4.00. On an investment of $20, the return (for one year) is $4.00/$20 = 20%.

6. You are given the following information concerning several mutual funds:

Fund	Return in Excess of the Treasury Bill Rate	Beta
A	12.4%	1.14
B	13.2	1.22

During the time period the Standard & Poor's stock index exceeded the Treasury bill rate by 10.5 percent (i.e., rm - rf = 10.5%).

(a) Rank the performance of each fund without adjusting for risk and adjusting for risk using the Treynor index. Which, if any, outperformed the market?

(b) The analsysis is part (a) assumes each fund is sufficiently diversified so that the appropriate measure of risk is te beta coefficient. Suppose, however, this assumption does not hold and the standard deviation of each fund's return was as follows:

Fund	Standard Deviation of Return
A	0.045 (=4.5%)
B	0.031

Thus, fund A earned a return of 12.4%, but appromixately 68% of the time this return has rnaged from 7.9% to 16.9%. The standard deviation of the market erturn is 0.01 (=1%), so 68% of the time, the return on the market has ranged from 9.5% to 11.5%. Rank the funds using this alternative measure of risk. Which, if any, outperformed the market on an risk-adjusted basis?

a. Without adjusting for risk, the performance ranking is B, A. The Treynor index for each fund is

Fund	Risk-adjusted return (Treynor Index)
A	12.4/1.14 = 10.88
B	13.2/1.22 = 10.82

On a risk-adjusted basis the ranking is A, B. Fund B had the largest absolute return, but on a risk-adjusted basis, it was the worst performer.

During the time period the S&P index achieved 10.5 percent over the risk-free rate, so the Treynor index for the market would be 10.5/1 = 10.5. If a fund's score exceeds 10.5, that

fund outperformed the market on a risk-adjusted basis. In this problem both funds outperformed the market.

b. The preceding risk adjustment used beta coefficients. If the standard deviations of return had been used, the risk adjusted ranking would be

Fund	Risk adjustment (Sharpe Index)
A	12.4/4.5 = 2.76
B	13.2/3.1 = 4.26

The risk-adjusted performance ranking is B, A.
The Sharpe index for the market is 10.5/1.0 = 10.5, so any fund that has a score in excess of 10.5 outperforms the market on a risk-adjusted basis. Neither A nor B outperformed the market using the Sharpe index. (Note that the two indices may not produce in the same ranking, especially if the portfolios are not well diversified in which case the Sharpe index is the better method because it uses total risk and not just systematic risk.)

Chapter 7. Closed-end investment companies

PROBLEMS

1.a. A closed-end investment company is currently selling for $10 and its net asset value is $10. You decide to purchase 100 shares. During the year, the company distributes $1 per share in dividends. At the end of the year, you sell the shares for $12. At the time of the sale, net asset value is $13. What percentage return do you earn on the investment if no commissions were charged?

For closed-end funds, the net asset value does not affect the return, which depends on the distributions received and the change in the price. The value of the shares rose from $1,000 to $1,200, hence the capital gain is $200, and the company made a distribution of $100. The percentage return is
($1200 + 100)/$1,000-1 = 30%

b. A closed-end investment company is currently selling for $10 and you purchase 100 shares. During the year, the company distributes $1 in dividends. At end of the year, you sell the shares for $12. The commission on each transaction (purchase and sale) is $50. What percentage return do you earn on the investment?

This problem adds the commissions on the purchase and sale. The percentage return is
($1200 + 100 - 50)/($1,000 + 50)-1 = 19.05%

The $50 commissions on both the purchase and the sale cut the return substantially. (Using an online broker would reduce the commissions.)

c. You buy 100 shares in a mutual fund at its net asset value of $10. The fund charges a load fee of 6 percent. During the year, the mutual fund distributes $1 in dividends. You redeem the shares for $12 per share, and the fund does not charge an exit fee. What percentage return do you earn on the investment?

In this problem, the investor acquires shares in a mutual fund that charges a load fee, which is charged when the shares are bought. The percentage return is

$$(\$1200 + 100)/(\$1,000 + 60) - 1 = 22.64\%$$

Unlike the commissions in the previous question, the load fee is paid only when the shares are purchased.

d. You buy 100 shares in a no-load mutual fund at its net asset value of $10. During the year, the mutual fund distributes $1 in dividends. You redeem the shares for $12 per share, but the fund charges a 6 percent exit fee. What percentage return do you earn on the investment?

The problem removes the upfront load fee but introduces the exit fee. The percentage return is

$$(\$1,200 + 100 - \$1,200 \times 0.06)/(\$1,000) - 1 = 22.8\%$$

e. You buy 100 shares in a no-load mutual fund at its net asset value of $10. During the year, the mutual fund distributes $1 in dividends. You redeem the shares for their net asset value of $13, and the fund does not charge an exit fee. What percentage return do you earn on the investment?

In this problem, the investor acquires shares in a fund that charges neither a load nor an exit fee. In addition, the selling price is the net assets value of $13 so capital gain is $300. The percentage return is

$$(\$300 + 100)/\$1,000 = 40\%$$

Each of the above parts starts with the same $10 cost, but the net return differs for each investment alternative.

Fees and commissions certainly reduce the return that the investor realizes, and they should be a consideration when making an investment. The load fee and the exit fee have the same impact if the percentages are the same.

If the investor uses an online broker, the commissions are less but that applies only to securities bought and sold in the securities markets and does not apply to shares of mutual funds that are bought and sold from and to the fund.