Part B

END-OF-CHAPTER

SOLUTIONS

***Fundamentals of Investments*, 6th edition**
Jordan, Miller, Dolvin

Chapter 1
A Brief History of Risk and Return

Concept Questions

1. For both risk and return, increasing order is *b, c, a, d*. On average, the higher the risk of an investment, the higher is its expected return.

2. Since the price didn't change, the capital gains yield was zero. If the total return was four percent, then the dividend yield must be four percent.

3. It is impossible to lose more than –100 percent of your investment. Therefore, return distributions are cut off on the lower tail at –100 percent; if returns were truly normally distributed, you could lose much more.

4. To calculate an arithmetic return, you simply sum the returns and divide by the number of returns. As such, arithmetic returns do not account for the effects of compounding. Geometric returns do account for the effects of compounding. As an investor, the more important return of an asset is the geometric return.

5. Blume's formula uses the arithmetic and geometric returns along with the number of observations to approximate a holding period return. When predicting a holding period return, the arithmetic return will tend to be too high and the geometric return will tend to be too low. Blume's formula adjusts these returns for different holding period expected returns.

6. T-bill rates were highest in the early eighties since inflation at the time was relatively high. As we discuss in our chapter on interest rates, rates on T-bills will almost always be slightly higher than the rate of inflation.

7. Risk premiums are about the same whether or not we account for inflation. The reason is that risk premiums are the difference between two returns, so inflation essentially nets out.

8. Returns, risk premiums, and volatility would all be lower than we estimated because aftertax returns are smaller than pretax returns.

9. We have seen that T-bills barely kept up with inflation before taxes. After taxes, investors in T-bills actually lost ground (assuming anything other than a very low tax rate). Thus, an all T-bill strategy will probably lose money in real dollars for a taxable investor.

10. It is important not to lose sight of the fact that the results we have discussed cover over 80 years, well beyond the investing lifetime for most of us. There have been extended periods during which small stocks have done terribly. Thus, one reason most investors will choose not to pursue a 100 percent stock (particularly small-cap stocks) strategy is that many investors have relatively short horizons, and high volatility investments may be very inappropriate in such cases. There are other reasons, but we will defer discussion of these to later chapters.

Solutions to Questions and Problems

NOTE: All end of chapter problems were solved using a spreadsheet. Many problems require multiple steps. Due to space and readability constraints, when these intermediate steps are included in this solutions manual, rounding may appear to have occurred. However, the final answer for each problem is found without rounding during any step in the problem.

Core Questions

1. Total dollar return = 100($41 – 37 + 0.28) = $428.00
Whether you choose to sell the stock or not does not affect the gain or loss for the year, your stock is worth what it would bring if you sold it. Whether you choose to do so or not is irrelevant (ignoring commissions and taxes).

2. Capital gains yield = ($41 – 37)/$37 = 10.81%
Dividend yield = $0.28/$37 = 0.76%
Total rate of return = 10.81% + 0.76% = 11.57%

3. Dollar return = 750($32 – 37 + 0.28) = –$3,540
Capital gains yield = ($32 – 37)/$37 = –13.51%
Dividend yield = $0.28/$37 = 0.76%
Total rate of return = –13.51% + 0.76% = –12.76%

4. *a.* average return = 5.9%, average risk premium = 2.1%
b. average return = 3.8%, average risk premium = 0%
c. average return = 11.7%, average risk premium = 7.9%
d. average return = 17.7%, average risk premium = 13.9%

5. Cherry average return = (17% + 11% – 2% + 3% + 14%) / 5 = 8.60%
Straw average return = (16% + 18% – 6% + 1% + 22%) / 5 = 10.20%

6. Cherry: $R_A = 8.60\%$
Var = $1/4[(.17 - .086)^2 + (.11 - .086)^2 + (-.02 - .086)^2 + (.03 - .086)^2 + (.14 - .086)^2] = 0.00623$
Standard deviation = $(0.00623)^{1/2} = 0.0789$ or 7.89%

Straw: $R_B = 10.20\%$
Var = $1/4[(.16 - .102)^2 + (.18 - .102)^2 + (-.06 - .102)^2 + (.01 - .102)^2 + (.22 - .102)^2] = 0.01452$
Standard deviation = $(0.01452)^{1/2} = 0.1205$ or 12.05%

7. The capital gains yield is ($49 – 56)/$56 = –.1250 or –12.5% (notice the negative sign). With a dividend yield of 1.3 percent, the total return is –11.20%.

8. Geometric return = $[(1 + .17)(1 + .11)(1 - .02)(1 + .03)(1 + .14)]^{(1/5)} - 1 = .0837$ or 8.37%

9. Arithmetic return = (.21 + .12 + .07 –.13 – .04 + .26) / 6 = .0817 or 8.17%
Geometric return = $[(1 + .21)(1 + .12)(1 + .07)(1 - .13)(1 - .04)(1 + .26)]^{(1/6)} - 1 = .0730$ or 7.30%

B – 4 SOLUTIONS

Intermediate Questions

10. That's plus or minus one standard deviation, so about two-thirds of the time, or two years out of three. In one year out of three, you will be outside this range, implying that you will be below it one year out of six and above it one year out of six.

11. You lose money if you have a negative return. With an 8 percent expected return and a 4 percent standard deviation, a zero return is two standard deviations below the average. The odds of being outside (above or below) two standard deviations are 5 percent; the odds of being below are half that, or 2.5 percent. (It's actually 2.28 percent.) You should expect to lose money only 2.5 years out of every 100. It's a pretty safe investment.

12. The average return is 5.9 percent, with a standard deviation of 11.9 percent, so Prob(Return < –6.0 or Return > 17.8) ≈ 1/3, but we are only interested in one tail; Prob(Return < –6.0) ≈ 1/6, which is half of 1/3 .
95%: $5.9 \pm 2\sigma = 5.9 \pm 2(11.9) = -17.9\%$ to 29.7%
99%: $5.9 \pm 3\sigma = 5.9 \pm 3(11.9) = -29.8\%$ to 41.6%

13. Expected return = 17.7% ; σ = 37.1%. Doubling your money is a 100% return, so if the return distribution is normal, $Z = (100 - 17.7)/37.1 = 2.22$ standard deviations; this is in-between two and three standard deviations, so the probability is small, somewhere between .5% and 2.5% (why?). Referring to the nearest Z table, the actual probability is = 1.327%, or about once every 100 years. Tripling your money would be $Z = (200 - 17.4)/ 37.1 = 4.92$ standard deviations; this corresponds to a probability of (much) less than 0.5%, or once every 200 years. (The actual answer is less than once every 1 million years, so don't hold your breath.)

14.

Year	Common stocks	T-bill return	Risk premium
1973	–14.69%	7.29%	–21.98%
1974	–26.47%	7.99%	–34.46%
1975	37.23%	5.87%	31.36%
1796	23.93%	5.07%	18.86%
1977	–7.16%	5.45%	–12.61%
sum	12.84%	31.67%	–18.83%

a. Annual risk premium = Common stock return – T-bill return (see table above).

b. Average returns: Common stocks = 12.84 / 5 = 2.57% ; T-bills = 31.67 / 5 = 6.33%;
Risk premium = –18.83 / 5 = –3.77%

c. Common stocks: $\text{Var} = 1/4[(-.1469 - .0257)^2 + (-.2647 - .0257)^2 + (.3723 - .0257)^2 + (.2393 - .0257)^2 + (-.0716 - .0257)^2] = 0.072337$
Standard deviation = $(0.072337)^{1/2} = 0.2690 = 26.90\%$
T-bills: $\text{Var} = 1/4[(.0729 - .0633)^2 + (.0799 - .0633)^2 + (.0587 - .0633)^2 + (.0507-.0633)^2 + (.0545 - .0633)^2] = 0.0001565$
Standard deviation = $(0.000156)^{1/2} = 0.0125 = 1.25\%$
Risk premium: $\text{Var} = 1/4[(-.2198 - (-.0377))^2 + (-.3446 - (-.0377))^2 + (.3136 - (-.0377))^2 + (.1886 - (-.0377))^2 + (-.1261 - (-.0377))^2] = 0.077446$
Standard deviation = $(0.077446)^{1/2} = 0.2783 = 27.83\%$

d. Before the fact, the risk premium will be positive; investors demand compensation over and above the risk-free return to invest their money in the risky asset. After the fact, the observed risk premium can be negative if the asset's nominal return is unexpectedly low, the risk-free return is unexpectedly high, or any combination of these two events.

15. $(\$231{,}000 / \$1{,}000)^{1/46} - 1 = .1256$ or 12.56%

16. 5 year estimate = $[(5 - 1)/(40 - 1)] \times 9.46\% + [(40 - 5)/(40 - 1)] \times 11.40\% = 11.20\%$
10 year estimate = $[(10 - 1)/(40 - 1)] \times 9.46\% + [(40 - 10)/(40 - 1)] \times 11.40\% = 10.95\%$
20 year estimate = $[(20 - 1)/(40 - 1)] \times 9.46\% + [(40 - 20)/(40 - 1)] \times 11.40\% = 10.45\%$

17. Small company stocks = $(\$12{,}971.38 / \$1)^{1/84} - 1 = .1193$ or 11.93%
Large company stocks = $(\$2{,}382.68 / \$1)^{1/84} - 1 = .0970$or 9.70%
Long-term government bonds = $(\$75.33 / \$1)^{1/84} - 1 = .0528$ or 5.28%
Treasury bills = $(\$22.33\ \$1)^{1/84} - 1 = .0377$ or 3.77%
Inflation = $(\$12.06 / \$1)^{1/84} - 1 = .0301$ or 3.01%

18. $R_A = (-0.12 + 0.15 + 0.11 + 0.19 - 0.02)/5 = .0620$ or 6.20%
$R_G = [(1 - .12)(1 + .15)(1 + .11)(1 + .19)(1 - .02)]^{1/5} - 1 = .0555$ or 5.55%

19. $R_1 = (\$25.61 - 23.25 + 0.15) / \$23.25 = 10.80\%$
$R_2 = (\$26.72 - 25.61 + 0.18) / \$25.61 = 5.04\%$
$R_3 = (\$25.18 - 26.72 + 0.20) / \$26.72 = -5.01\%$
$R_4 = (\$27.12 - 25.18 + 0.24) / \$25.18 = 8.66\%$
$R_5 = (\$30.43 - 27.12 + 0.28) / \$27.12 = 13.24\%$
$R_A = (0.1080 + .0504 - .0501 + 0.0866 + 0.1324)/5 = .0654$ or 6.54%
$R_G = [(1 + .1080)(1 + .0504)(1 - .0501)(1 + .0866)(1 + .1324)]^{1/5} - 1 = .0634$ or 6.34%

20. Stock A: $R_A = (0.08 + 0.08 + 0.08 + 0.08 + 0.08)/5 = .0800$ or 8.00%
$\text{Var} = 1/4[(.08 - .08)^2 + (.08 - .08)^2 + (.08 - .08)^2 + (.08 - .08)^2 + (.08 - .08)^2] = 0.000000$
Standard deviation $= (0.000)^{1/2} = 0.000$ or 0.00%
$R_G = [(1 + .08)(1 + .08)(1 + .08)(1 + .08)(1 + .08)]^{1/5} - 1 = .0800$ or 8.00%

Stock B: $R_A = (0.03 + 0.13 + 0.07 + 0.05 + 0.12)/5 = .0800$ or 8.00%
$\text{Var} = 1/4[(.03 - .08)^2 + (.13 - .08)^2 + (.07 - .08)^2 + (.05 - .08)^2 + (.12 - .08)^2] = 0.001900$
Standard deviation $= (0.001900)^{1/2} = 0.0436$ or 4.36%
$R_G = [(1 + .03)(1 + .13)(1 + .07)(1 + .05)(1 + .12)]^{1/5} - 1 = .0793$ or 7.93%

Stock C: $R_A = (-0.24 + 0.37 + 0.14 + 0.09 + 0.04)/5 = .0800$ or 8.00%
$\text{Var} = 1/4[(-.24 - .08)^2 + (.37 - .08)^2 + (.14 - .08)^2 + (.09 - .08)^2 + (.04 - .08)^2] = 0.047950$
Standard deviation $= (0.047950)^{1/2} = 0.2190$ or 21.90%
$R_G = [(1 - .24)(1 + .37)(1 + .14)(1 + .09)(1 + .04)]^{1/5} - 1 = .0612$ or 6.12%

The larger the standard deviation, the greater will be the difference between the arithmetic return and geometric return. In fact, for lognormally distributed returns, another formula to find the geometric return is arithmetic return – ½ variance. Therefore, for Stock C, we get .0800 – ½(.047950) = .0560. The difference in this case is because the return sample is not a true lognormal distribution.

Spreadsheet Problems

	A	B	C	D	E	F	G	H
1			**Chapter 1**					
2			Question 21					
3								
4			*Input area:*					
5								
6								
7				Year	Return	Year	Return	
8				1980	32.50%	1985	31.73%	
9				1981	-4.92%	1986	18.67%	
10				1982	21.55%	1987	5.25%	
11				1983	22.56%	1988	16.61%	
12				1984	6.27%	1989	31.69%	
13								
14								
15								
16			Average return	18.19%	=AVERAGE(D8:D12,F8:F12)			
17								
18			Variance	0.01608	=VAR(D8:D12,F8:F12)			
19								
20			Standard Deviation	12.68%	=STDEV(D8:D12,F8:F12)			
21								
22								

	A	B	C	D	E	F	G	H
1			**Chapter 1**					
2			Question 22					
3								
4			*Input area:*					
5								
6								
7			Time	Deposit	Return			
8			0	$ 1,000				
9			1	$ 1,000	12%			
10			2	$ 1,000	5%			
11			3	$ 1,000	8%			
12			4	$ 1,000	-7%			
13			5		-14%			
14								
15								
16			Arithmetic Average	0.80%	=AVERAGE(E9:E13)			
17								
18			Geometric Average	0.31%	=((1+E9)*(1+E10)*(1+E11)*(1+E12)*(1+E13))^(1/5)-1			
19								
20			Ending Portfolio Value					
21			Year 1	$ 1,120.00	=D8*(1+E9)			
22			Year 2	$ 2,226.00	=(D21+D9)*(1+E10)			
23			Year 3	$ 3,484.08	=(D22+D10)*(1+E11)			
24			Year 4	$ 4,170.19	=(D23+D11)*(1+E12)			
25			Year 5	$ 4,446.37	=(D24+D12)*(1+E13)			
26								
27			Dollar Weighted Average					
28			CF0	$ (1,000)	=-D8			
29			CF1	$ (1,000)	=-D9			
30			CF2	$ (1,000)	=-D10			
31			CF3	$ (1,000)	=-D11			
32			CF4	$ (1,000)	=-D12			
33			CF5	$ 4,446.37	=D25			
34			IRR	-3.89%	=IRR(D28:D33)			
35								
36			Because the investor deposited more money (i.e., had the most invested) prior/during					
37			the worst return years, the dollar weighted return is lower.					

CFA Exam Review by Schweser

1. a

Geometric average return = $[(0.9)(1.25)(0.95)(1.30)(1.05)]^{1/5}-1 = 7.85\%$

2. b

	Scenario 2	Scenario 3
CF_0	-100	-100
CF_1	0	0
CF_2	-20	+10
CF_3	0	0
CF_4	0	0
CF_5	171.82	132.92
IRR	7.96%	7.78%

Scenario 2 Ending MV

End of Year 2 = 100(0.9)(1.25) + 20 = 132.5

End of Year 5 = 132.5(0.95)(1.30)(1.05) = 171.8194

Scenario 3 Ending MV

End of Year 2 = 100(0.9)(1.25) - 10 = 102.5

End of Year 5 = 102.5(0.95)(1.30)(1.05) = 132.9169

3. c

Annualized return = $(1.0163)^{12} - 1 = 21.412\%$

4. b

Geometric returns provide the best estimate of a portfolio manager's return because it neutralizes the impact of the client's cash flow decisions. For the clients themselves, the dollar weighted return would be appropriate.

Chapter 2
The Investment Process

Concept Questions

1. Purchasing on margin means borrowing some of the money used to buy securities. You do it because you desire a larger position than you can afford to pay for, recognizing that using margin is a form of financial leverage. As such, your gains and losses will be magnified. Of course, you hope you only experience the gains.

2. Shorting a security means borrowing it and selling it, with the understanding that at some future date you will buy the security and return it, thereby "covering" the short. You do it because you believe the security's value will decline, so you hope to sell high now, then buy low later.

3. Margin requirements amount to security deposits. They exist to protect your broker against losses.

4. Asset allocation means choosing among broad categories such as stocks and bonds. Security selection means picking individual assets within a particular category, such as shares of stock in particular companies.

5. Tactical asset allocation is making small, short-term adjustments to your longer-term strategic allocation. The idea is to overweight sectors with the greatest potential for gains. Since you are effectively trying to determine which sectors will perform the best, tactical asset allocation can be considered a form of market timing.

6. A broker simply conducts trades on your behalf, and in return he receives a commission. An advisor is typically a fee-based relationship, where you pay an annual percentage of assets, which covers the cost of all advice and trades. With an advisory relationship, the interests of the advisor and investor may be better aligned, as the incentive to "churn" is eliminated.

7. Probably none. The advice you receive is unconditionally *not* guaranteed. If the recommendation was grossly unsuitable or improper, then arbitration is probably your only possible means of recovery. Of course, you can close your account, or at least what's left of it.

8. If you buy (go long) 500 shares at $18, you have a total of $9,000 invested. This is the most you can lose because the worst that could happen is that the company could go bankrupt, leaving you with worthless shares. There is no limit to what you can make because there is no maximum value for your shares – they can increase in value without limit.

9. If the asset is illiquid, it may be difficult to quickly sell it during market declines, or to purchase it during market rallies. Hence, special care should always be given to investment positions in illiquid assets, especially in times of market turmoil

10. Traditional IRAs are tax-deferred, with withdrawals being taxed. Contributions to Roth IRAs are taxed up-front, but all deposits grow tax free. Thus, an investor who is currently in a low tax bracket (such as a college student) may prefer a Roth as the benefit of the tax-free growth outweighs the tax benefit of the traditional tax-deferred IRA.

B – 10 SOLUTIONS

Solutions to Questions and Problems

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Core questions

1. Maximum investment = $31,000 / .60 = $51,667
Number of shares = $51,667 / $17 per share = 3,039.22 (or 3,039) shares

2. Margin loan = ($35 × 750) – $14,000 = $12,250
Margin requirement = $14,000 / ($35 × 750) = 0.5333 or 53.33%

3. Terminal price = $42
Without margin = ($42 – 35) / $35 = 20%
With margin = {($42 × 750) – ($35 × 750) } / $14,000 = 37.50%

Terminal price = $34
Without margin = ($34 – 35) / $35 = –2.86%
With margin = {($34 × 750) – ($35 × 750)} / $14,000 = –5.36%

4. Initial deposit = 0.30 × ($35 × 750) = $7,875

Terminal price = $42
Without margin = ($42 – 35) / $35 = 20%
With margin = {($42 × 750) – ($35 × 750)} / $7,875 = 66.67%

Terminal price = $34
Without margin = ($34 – 35) / $35 = –2.86%
With margin = {($34 × 750) – ($35 × 750)} / $7,875 = –9.52%

A lower initial margin requirement will make the returns more volatile. In other words, a stock price increase will increase the return, and a stock price decrease will cause a greater loss.

5. Maximum purchase = $22,000 / .55 = $40,000

6. Amount borrowed = (400 × $55) - (400 × $55)(.60) = $8,800
Margin call price = ($8,800/400) / (1-.3) = $31.43

7. Amount borrowed = (1,200 × $34)(1 – .55) = $18,360
Margin call price = ($18,360/1,200) / (1-.35) = $23.54
Stock price decline = ($23.54 - $34) / $34 = –30.77%

8. Proceeds from short sale = 900 × $17 = $15,300
Initial deposit = $15,300 (.60) = $9,180
Account value = $15,300 + $9,180 = $24,480
Margin call price = $24,480 / [900 + (.30 × 900)] = $20.92

9. Proceeds from short sale = 1,000($36) = $36,000
Initial deposit = $36,000(.55) = $19,800
Account value = $36,000 + 19,800 = $55,800
Margin call price = $55,800 / [1,000 + (.35 × 1,000)] = $41.33
Account equity = $55,800 – (1,000 × $41.33) = $14,470

10. Pretax return = ($97 – 81 + 1.80) / $81 = 21.98%
Aftertax capital gains = ($97 – 81)(1 – .30) = $11.20
Aftertax dividend = $1.80(1 – .15) = $1.53
Aftertax return = ($11.20 + 1.53) / $81 = 15.72%

Intermediate questions

11.

Assets		Liabilities and account equity	
3039 shares	$51,663.00	Margin loan	$20,665.20
		Account equity	30,997.80
Total	$51,663.00	Total	$51,663.00

Stock price = $24

Assets		Liabilities and account equity	
3039 shares	$72,936.00	Margin loan	$20,665.20
		Account equity	52,270.80
Total	$72,936.00	Total	$72,936

Margin = $52,270.80/$72,936 = 71.67%

Stock price = $14

Assets		Liabilities and account equity	
3039 shares	$42,546.00	Margin loan	$20,665.20
		Account equity	21,880.80
Total	$42,546.00	Total	$42,546.00

Margin = $21,880.80/$42,546 = 51.43%

12. 600 shares × $46 per share = $27,600
Initial margin = $11,000/$27,600 = 39.86%

Assets		Liabilities and account equity	
600 shares	$27,600	Margin loan	$16,600
		Account equity	11,000
Total	$27,600	Total	$27,600

13. Total purchase = 500 shares × $48 = $24,000
Margin loan = $24,000 – 8,000 = $16,000
Margin call price = $16,000 / [500 – (.30 × 500)] = $45.71

To meet a margin call, you can deposit additional cash into your trading account, liquidate shares until your margin requirement is met, or deposit additional marketable securities against your account as collateral.

14. Interest on loan = $16,000(1.065) – 16,000 = $1,040

a. Proceeds from sale = 500($56) = $28,000
Dollar return = $28,000 – 8,000 – 16,000 – 1,040 = $2,960
Rate of return = $2,960/ $8,000 = 37.00%
Without margin, rate of return = ($56 – 48)/$48 = 16.67%

b. Proceeds from sale = 500($48) = $24,000
Dollar return = $24,000 – 8,000 – 16,000 – 1,040 = –$1,040
Rate of return = –$1,040 / $8,000 = –13.00%
Without margin, rate of return = $0%

c. Proceeds from sale = 500($32) = $16,000
Dollar return = $16,000 – 8,000 – 16,000 – 1,040 = –$9,040
Rate of return = –$9,040 / $8,000 = –113.00%
Without margin, rate of return = ($32 – 48) / $48 = –33.33%

15. Initial equity = (1,000 × $51)(.40) = $20,400
Amount borrowed = (1,000 × $51)(1 – .40) = $30,600
Interest = $30,600 × .0870 = $2,662
Proceeds from sale = 1,000 × $57 = $57,000
Dollar return = $57,000 – 20,400 – 30,600 – 2,662 = $3,338
Rate of return = $3,338 / $20,400 = 16.36%

16. Total purchase = 800 × $34 = $27,200
Loan = $27,200 – 15,000 = $12,200
Interest = $12,200 × .07 = $854
Proceeds from sale = 800 × $48 = $38,400
Dividends = 800 × $.64 = $512
Dollar return = $38,400 + 512 – 15,000 – 12,200 – 854= $10,858
Return = $10,858 / $15,000 = 72.39%

17. $50,000 × $(1.084)^{6/12}$ – 50,000 = $2,057.66

18. $39,000 × $(1.058)^{2/12}$ – 39,000 = $368.20

19. $(1 + .06)^{12/7} – 1 = 10.50\%$

20. $(1 + .06)^{12/5} – 1 = 15.01\%$
All else the same, the shorter the holding period, the larger the EAR.

21. Holding period return = ($61 – 57 + .60) / $57 = 8.07%
EAR = $(1 + .0807)^{12/5} – 1 = 20.47\%$

22. Initial purchase = 600 × $46 = $27,600
Amount borrowed = $27,600 – 11,000 = $16,600
Interest on loan = $16,600(1 + .0725)$^{1/2}$ – 16,600 = $591.22
Dividends received = 600($.25) = $150.00
Proceeds from stock sale = 600($53) = $31,800
Dollar return = $31,800 + 150 – 11,000 – 16,600 – 591.22 = $3,758.78
Rate of return = $3,758.78 / $11,000 = 34.17% per six months
Effective annual return = (1 + .3417)$^{12/6}$ – 1 = 80.02%

23. Proceeds from sale = 800 × $47 = $37.600
Initial margin = $37,600 × 1.00 = $37,600

Assets		Liabilities and account equity	
Proceeds from sale	$37,600	Short position	$37,600
Initial margin deposit	37,600	Account equity	37,600
Total	$75,200	Total	$75,200

24. Proceeds from sale = 800 × $47 = $37.600
Initial margin = $37,600 × .75 = $28,200

Assets		Liabilities and account equity	
Proceeds from sale	$37,600	Short position	$37,600
Initial margin deposit	28,200	Account equity	28,200
Total	$65,800	Total	$65,800

25. Proceeds from short sale = 750($96) = $72,000
Initial margin deposit = $72,000(.60) = $43,200
Total assets = Total liabilities and equity = $72,000 + 43,200 = $115,200
Cost of covering short = 750($86.50) = $64,875
Account equity = $115,200 – 64,875 = $50,325
Cost of covering dividends = 750($0.75) = $563
Dollar profit = $50,325 – 43,200 – 563 = $6,563
Rate of return = $6,563 / $43,200 = 15.19%

26. Proceeds from sale = 600 × $72 = $43,200
Initial margin = $43,200 × .50 = $21,600

Initial Balance Sheet

Assets		Liabilities and account equity	
Proceeds from sale	$ 43,200	Short position	$ 43,200
Initial margin deposit	21,600	Account equity	21,600
Total	$ 64,800	Total	$ 64,800

Stock price = $63

Assets		Liabilities and account equity	
Proceeds from sale	$ 43,200	Short position	$ 37,800
Initial margin deposit	21,600	Account equity	27,000
Total	$ 64,800	Total	$ 64,800

Margin = $27,000 / $37,800 = 71.43%
Five-month return = ($27,000 – 21,600) / $21,600 = 25%
Effective annual return = $(1 + .25)^{12/5} – 1 = 70.84\%$

Stock price = $77

Assets		Liabilities and account equity	
Proceeds from sale	$ 43,200	Short position	$ 46,200
Initial margin deposit	21,600	Account equity	18,600
Total	$ 64,800	Total	$ 64,800

Margin = $18,600 / $46,200 = 40.26%
Five-month return = ($18,600 – 21,600) / $21,600 = –13.89%
Effective annual return = $(1 – .1389)^{12/5} – 1 = –30.15\%$

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5. a
The Analee's pre-tax return objective is computed as follows:

Living expenses	$75,000
Travel expenses	15,000
College fund	20,000
Total	$110,000

Portfolio Value = $3,000,000

Income objective = $110,000 / 3,000,000 =	3.67%
Plus inflation	3.00%
Gross Return Objective	6.67%

6. a

Their risk tolerance is average. Their liquidity needs are high due to their living expenses, yet their portfolio is large enough. Since they are in their retirement years, they will be living off their portfolio and not adding to it other than the growth in the portfolio to stay even with inflation.

7. a

   Although Barbara's willingness to assume risk may be high (above average) given her past entrepreneurial pursuits and the Analee's time horizon is quite long, her ability to assume risk is average given her current income needs.

8. a

   The most appropriate portfolio is A, as it provides a good balance in terms of return objectives, risk tolerance, and constraints. The portfolio provides an adequate return (8.8%) versus their requirement (6.8%), and it provides sufficient income while minimizing the impact of inflation.

   Portfolio B is inappropriate because it concentrates a higher proportion of assets into VC and REITs, which are lower liquidity and higher volatility assets. Portfolio C is inappropriate because it does not meet the return objective.

Chapter 3
Overview of Security Types

Concept Questions

1. The two distinguishing characteristics are: (1) all money market instruments are debt instruments (i.e., IOUs), and (2) all have less than 12 months to maturity when originally issued.

2. Preferred stockholders have a dividend preference and a liquidation preference. The dividend preference requires that preferred stockholders be paid before common stockholders. The liquidation preference means that, in the event of liquidation, the preferred stockholders will receive a fixed face value per share before the common stockholders receive anything.

3. The PE ratio is the price per share divided by annual earnings per share (EPS). EPS is the sum of the most recent four quarters' earnings per share.

4. The current yield on a bond is very similar in concept to the dividend yield on common and preferred stock

5. Volume in stocks is quoted in round lots (multiples of 100). Volume in corporate bonds is the actual number of bonds. Volume in options is reported in contracts; each contract represents the right to buy or sell 100 shares. Volume in futures contracts is reported in contracts, where each contract represents a fixed amount of the underlying asset.

6. You make or lose money on a futures contract when the *futures* price changes, not the current price for immediate delivery (although the two are closely related).

7. Open interest is the number of outstanding contracts. Since most contract positions will be closed before maturity, it will usually shrink as maturity approaches.

8. A futures contact is a contract to buy or sell an asset at some point in the future. Both parties in the contract are legally obligated to fulfill their side of the contract. In an option contract, the buyer has the right, but not the obligation, to buy (call) or sell (put) the asset. This option is not available to the buyer of a futures contract. The seller of a futures or options contract has the same responsibility to deliver the underlying asset. The difference is the seller of a future knows she must deliver the asset, while the seller of an option contract is uncertain about delivery since delivery is at the option purchasers discretion.

9. A real asset is a tangible asset such as a land, buildings, precious metals, knowledge, etc. A financial asset is a legal claim on a real asset. The two basic types of financial assets are primary assets and derivative assets. A primary asset is a direct claim on a real asset. A derivative asset is basically a claim (or potential claim) on a primary asset or even another derivative asset.

10. Initially, it might seem that the put and the call would have the same price, but this is not correct. If the strike price is exactly equal to the stock price, the call option must be worth more. Intuitively, there are two reasons. First, there is no limit to what you can make on the call, but your potential gain on the put is limited to $100 per share. Second, we generally expect that the stock price will increase, so the odds are greater that the call option will be worth something at maturity.

Core Questions

1. Dividend yield = .013 = \$.75 / P_0 thus P_0 = \$.75 / .013 = \$57.69
Stock closed up \$.26, so yesterday's closing price = \$57.69 – 0.26 = \$57.43
18,649,130 shares were traded, which means 18,649,130 / 100 = 186,491 round lots of stock were traded.

2. PE = 16; EPS = P_0 / 16 = \$57.69 / 16 = \$3.606
EPS = NI / shares; so NI = \$3.606(95,000,000) = \$342,548,077

3. Dividend yield is 2.8%, so annualized dividend is .028(\$69.80) = \$1.95. This is just four times the last quarterly dividend, which is thus \$1.9544/4 = \$.49/share.

4. PE = 21.5; EPS = P_0 / 21.5 = \$69.80 / 21.50 = \$3.25

5. The total par value of purchase = 3,000(\$1,000) = \$3,000,000
Next payment = (\$3,000,000 × .072) / 2 = \$108,000
Payment at maturity = \$108,000 + 3,000,000 = \$3,108,000

Remember, the coupon payment is based on the par value of the bond, not the price.

6. Contract to buy = 500 / 50 = 10
Purchase price = 10 × 50 × \$1,530 = \$765,000
P = \$1,565: Gain = (\$1,565 – 1,530) × 10 × 50 = \$17,500
P = \$1,475: Gain = (\$1,475 – 1,530) × 10 × 50 = –\$27,500

7. Cost of contracts = \$3.85 × 7 × 100 = \$2,695
If the stock price is \$83.61, the value is: (\$83.61 – 75) × 7 × 100 = \$6,027
Dollar return = \$6,027 – 2,695 = \$3,332
If the stock price is \$69.56, the call is worthless, so the dollar return is –\$2,695.

8. The stock is down 1.2%, so the price was \$48.92/(1 – .012) = \$49.51

9. The YTM is given in the quote as 7.482%.
Price = (93.231/100)\$1,000 = \$932.31
Current yield = Annual coupon payment / Price = \$68.50 / \$932.31 = 7.347%

10. Next payment = 25(.06850/2)(\$1,000) = \$856.25

Intermediate Questions

11. Open interest in the March contract is 597,913 contracts.
Since the standard contract size is 5,000 bushels, sell 225,000/5,000 = 45 contracts.
You'll deliver 45(5,000) = 225,000 bushels of corn and receive 45(5,000)(\$4.52) = \$1,017,000

12. The price you sold the contracts was 468 (\$4.68) and you closed the position at 465 3/8 (\$4.65375).
So, the total profit was (\$4.68 – 4.65375) × 5,000 × 25 = \$3,281.25

13. Initial value of position = 15(5,000)(\$4.7225) = \$354,187.50
Final value of position = 15(5,000)(\$4.62125) = \$346,593.75
Dollar profit = \$346,593.75 – 354,187.50 = –\$7,593.75

14. The right to sell shares is a put option on the stock; the May put with a strike price of $27 has an ask price of $2.95. Since each stock option contract is for 100 shares of stock, you're looking at 2,000/100 = 20 option contracts. Thus, the cost of purchasing this right is 20($2.95)(100) = $5,900.

15. The cheapest put contract (that traded on this particular day) is the $15. The most expensive option is the $31. The first option is the furthest out of the money, while the second option is the furthest in the money. Remember, a put gives the right to sell, and we always want to "sell high."

16. Case 1: Payoff = $27 – 22.91 = $4.09/share. Dollar return = $4.09(20)(100) – $5,900 = $2,280
Return on investment per 3 months = $2,280 / $5,900 = 38.64%
Annualized return on investment = $(1.3864)^{12/3} - 1 = 269.49\%$

Case 2: The option finishes worthless, so payoff = $0. Dollar return = –$5,900
Return on investment = –100% over all time periods.

17. The very first call option listed has a strike price of 10 and a quoted premium of $5.50. This can't be right because you could buy an option for $5.50 and immediately exercise it for another $10. You can then sell the stock for its current price of $20.25, earning a large, riskless profit. To prevent this kind of easy money, the option premium must be at least $10.25. Similarly, the September 30 put is quoted at $8.75. You could buy the put and immediately exercise it. The put premium must be at least $9.75.

18. If you buy the stock, your $28,000 will purchase 700 shares, or 7 round lots. A call contract costs $400, so you can buy 70 of them. If, in six months, MMEE is selling for $48, your stock will be worth 700 shares × $48 = $33,600. Your dollar gain will be $33,600 less the $28,000 you invested, or $5,600. Since you invested $28,000, your return for the six-month period is $5,600/$28,000 = 20%. To annualize your return, we need to compute the effective annual return, recognizing that there are two six-month periods in a year.

$1 + EAR = 1.20^2 = 1.44$
$EAR = .44$ or 44%
Your annualized return on the stock is 44%.

If MMEE is selling for $36 per share, your loss on the stock investment is –10.00%, which annualizes as follows:

$1 + EAR = .9000^2 = .81$
$EAR = -.19$ or –19%

At the $48 price, your call options are worth $48 – 40 = $8 each, but now you control 7,000 shares (70 contracts), so your options are worth 7,000 shares × $8 = $56,000 total. You invested $28,000, so your dollar return is $56,000 – 28,000 = $28,000, and your percentage return is $28,000/$28,000 = 100%, compared to 20% on the stock investment. This annualizes to:

$1 + EAR = 2.00^2 = 4.00$
$EAR = 3.00$ or 300%

However, if MMEE is selling for $36 when your options mature, then you lose everything ($28,000 investment), and your return is –100%.

19. You only get the dividend if you own the stock. The dividend would increase the return on your stock investment by the amount of the dividend yield, \$.80/\$40 = .020, or 2.0%, but it would have no effect on your option investment. This question illustrates that an important difference between owning the stock and the option is that you only get the dividend if you own the stock.

20. At the \$36 stock price, your put options are worth \$40 – 36 = \$4 each. The premium was \$2.80, so you bought 100 contracts, meaning you control 10,000 shares. Your options are worth 10,00 shares × \$4 = \$40,000 total. You invested \$28,000, so your dollar return is \$40,000 – 28,000 = \$12,000, and your percentage return is \$12,000/\$28,000 = 42.86%. This annualizes to:

$$1 + \text{EAR} = 1.4286^2 = 2.0408$$
$$\text{EAR} = 1.0408 \text{ or } 104.08\%$$

Chapter 4
Mutual Funds

Concept Questions

1. Mutual funds are owned by fund shareholders. A fund is run by the fund manager, who is hired by the fund's directors. The fund's directors are elected by the shareholders.

2. A rational investor might pay a load because he or she desires a particular type of fund or fund manager for which a no-load alternative does not exist. More generally, some investors feel you get what you pay for and are willing to pay more. Whether they are correct or not is a matter of some debate. Other investors simply are not aware of the full range of alternatives.

3. The NAV of a money market mutual fund is never *supposed* to change; it is supposed to stay at a constant $1. It never rises; only in very rare instances does it fall. Maintaining a constant NAV is possible by simply increasing the number of shares as needed such that the number of shares is always equal to the total dollar value of the fund.

4. A money market deposit account is essentially a bank savings account. A money market mutual fund is a true mutual fund. A bank deposit is insured by the FDIC, so it is safer, at least up to the maximum insured amount.

5. ETFs are very popular with active traders since they allow an investor to use margin to purchase the asset. They also provide the ability to short sell, and they are continuously priced. In contrast, mutual funds have only end-of-day pricing. For periodic investors who are investing small amounts, mutual funds may be a better choice since the commissions associated with investing in ETFs would be costly.

6. In an up market, the cash balance will reduce the overall return since the fund is partly invested in assets with a lower return. In a down market, a cash balance should help reduce the negative returns from stocks or other instruments. An open-end fund typically keeps a cash balance to meet shareholder redemptions. A closed-end fund does not have shareholder redemptions so very little cash, if any, is kept in the portfolio.

7. 12b-1 fees are designed to pay for marketing and distribution costs. It does not really make sense that a closed-end fund charges 12b-1 fees because there is no need to market the fund once it has been sold at the IPO and there are no distributions necessary for the fund since the shares are sold on the secondary market.

8. You should probably buy an open-end fund because the fund stands ready to buy back shares at NAV. With a closed-end fund another buyer must make the purchase, so it may be more difficult to sell at NAV. We should note that an open-end fund may have the right to delay redemption if it so chooses.

9. Funds that accumulate a long record of poor performance tend to not attract investors. They are often simply merged into other funds. This is a type of survivor bias, meaning that a mutual fund family's typical long-term track record may look pretty good, but only because the poor performing funds did not survive. In fact, several hundred funds disappear each year.