Chapter 1

1. Finance is a discipline concerned with determining value and making decisions. The finance function allocates resources, which includes acquiring, investing, and managing the resources. Financial management is an area of finance that applies financial principles within an organization to create and maintain value through decision making and proper resource management. The first major question that financial managers deal with is investment decisions. These decisions are primarily concerned with the asset (left) side of the balance sheet. They answer such questions as should we buy new computers or a new warehouse? The second major question deals with financial decisions. These decisions are primarily concerned with the liabilities and stockholders' equity (right) side of the balance sheet. They answer such questions as how much debt should we have and should the debt be short- or long-term, or should we borrow in foreign currency? The third major question deals with managerial decisions. These decisions are primarily concerned with the company's day-to-day operating and financial decisions. They answer such questions as how large should the company be, and how fast should it grow?

2. The two basic types of financial securities that companies issue are equity and debt. Equity is the company's ownership and is typically represented by shares of common stock. Common stock is a proportional form of equity. Debt is a legal obligation to make contractually agreed upon future payments, identified as interest and repayment of the principal (original debt amount). Debtholders loan the company money but have no claim of ownership as long as the company meets its payment obligations. The company controls the use of the funds.

5. Investment decisions are primarily concerned with the asset or left side of the balance sheet. Such decisions include whether to introduce a new product. Financial decisions are primarily concerned with the liabilities and stockholders' equity or right side of the balance sheet. Such decisions include whether to issue new stock in the company.

Chapter 2

1. **Opportunity cost** - The difference between the value of one action and the value of the best alternative action.
   Principal-Agent relationship - A situation in which one participant, the *agent*, makes decisions that affect another participant, the *principal*.
   Moral hazard - A situation in which an agent can take unseen actions for personal benefit even though such actions are costly to the principal.
   Zero-sum game - A situation in which one player can gain only at the expense of another player.
   Sunk Cost - A cost that has already been incurred and cannot be altered by subsequent decisions.
   Hubris - An arrogance due to excessive pride and an insolence toward others.
   Adverse Selection - When offering something to the market seems to indicate something negative about what is being offered.

2. One principal-agent relationship in which a moral hazard could arise is the relationship between an owner and a manager. A manager could take a nap while on the job, or use the company car for personal business. These actions benefit the manager at the expense of the owner without the owner ever knowing.

3. **Option** - The right, without obligation, to do something.
   Call option - The right to *buy* something at a given price during the life of the option.
   Put option - The right to *sell* something at a given price during the life of the option.

6. Limited liability is a legal concept within bankruptcy that limits an investor's possible loss to what has already been invested. Limited liability creates an option for a borrower because the borrower has the option to default or not fully repay a debt.

Chapter 3

2. The balance sheet identity is: Assets = Liabilities + Stockholders' Equity

3. An increase in interest rates would cause the market value of a firm's liabilities to decrease relative to the book value. (This occurs because the present value of the future payments is less with a higher interest rate.)

4. High inflation would cause the market value of a firm's assets to increase relative to the book value. (This occurs because inflation increases the nominal value of an asset, but the book value is unchanged.)

7. a. Current assets are assets that are expected to become cash within one year. Other classes of assets will not become cash within one year.
   b. Current liabilities are liabilities that mature or will be paid off within one year. Other classes of liabilities have a longer maturity.

8. Cash flow is the change in a firm's cash position over a given amount of time. It differs from earnings in that earnings include noncash items, such as depreciation and accruals. Earnings also ignore some cash items, such as large expenditures for plants and equipment. Cash flow only measures changes in cash.

9. Working capital is the difference between current assets and current liabilities and is a measure of a business's liquidity and its ability to meet short-term obligations.
   Working Capital = Current Assets – Current Liabilities.

11. Time since acquisition, inflation, liquidity, and tangibility are four factors that are likely to cause differences between the market and book values of an asset. At the time an asset is purchased, market and book values are likely to be the same, but over time differences will occur as depreciation, specified by GAAP, is unlikely to reflect economic reality. Inflation creates differences between market and book values because it causes the value of the dollar relative to the asset, or purchasing power, to change. Liquidity causes differences between market and book values because high search costs, transaction costs, and few potential buyers for illiquid assets create uncertainty in the net proceeds from a sale. Intangible assets tend to be variable, unique, and illiquid, thus causing differences between their market and book values.

3A1.

Johnson's Scuba Co.
Balance Sheet, As of January 31
(Numbers are in $000s)

ASSETS		LIABILITIES & STOCKHOLDERS' EQUITY	
Cash and equivalents	$300	Accounts payable	$500
Accounts receivable	700	Notes payable	250
Inventories	500	Other current liabilities	400
Total current assets	1,500	Total current liabilities	1,150
Net plant and equipment	3,000	Long-term debt	1,000
Total assets	$4,500	Total liabilities	2,150
		Common Stock	500
		Retained earnings	1,850
		Total liabilities & equity	$4,500

3A1. Continued

Johnson's Scuba Co.
Income Statement, Year Ended January 31
(Numbers are in $000s)

Sales	$4,000
Cost of goods sold	2,000
Gross Profit	2,000
Selling, general and administrative expenses	1,000
Depreciation	200
Earnings before interest and taxes	800
Interest expense	50
Earnings before taxes	750
Taxes	250
Net income	500
Dividends on common shares	100
Addition to retained earnings	$400

3A3.

Dutch Retail, Inc.
Income Statement, Year Ended December 31

Sales	$900
Cost of goods sold	200
Gross Profit	700
Selling, general and administrative expenses	165
Depreciation	150
Earnings before interest and taxes	385
Interest expense	100
Earnings before taxes	285
Taxes	114
Net income	171
Preferred dividends	50
Net income available for common	121
Dividends on common stock	100
Addition to retained earnings	$21

Chapter 4

4A3. a. Rate of Return = (Cash Flow + Ending Value - Beginning Value)/Beginning Value
Rivas: Expected Return = ($1.00 + $56 - $45)/$45 = 26.67%
Carreras: Expected Return = ($5.00 + $132 - $125)/$125 = 9.60%

b. If the required rate of return is 15%, Rivas should be a profitable investment, Carreras should not.

c. Rivas: Realized Return = ($1.00 + $52 - $45)/$45 = 17.78%
Carreras: Realized Return = ($5.00 + $155 - $125)/$125 = 28.00%

4A7. a. $PV = FV/(1 + r)^n$ $PV = 45{,}000/(1 + .056)^3$ PV = 38,213.85

b. $FV = PV(1 + r)^n$ $FV = 250(1 + .121)^{5.5}$ FV = 468.57

c. PV = FV so no interest has been earned. r = 0% or
CALC: n = 4 r = ? PV = -500 PMT = 0 FV = 500 **r = 0%**
With the TI BAII Plus, you must enter the PV and FV to be a tiny bit different (such as 500.000001 for FV) so that it does not give you "Error 5"

d. CALC: n = ? r = 7.75% PV = -25,000 PMT = 0 FV = 78,000 **n = 15.24**

4A12. CALC: n = 4 r = 15% PV = $9,500 PMT = ? FV = 0 **PMT = -$3,327.52**

Year	Beginning Principal	Interest Charged	Balance	Payment	Remaining Principal
1	$ 9,500.00	$ 1,425.00	$10,925.00	$3,327.52	$ 7,597.48
2	$ 7,597.48	$ 1,139.62	$ 8,737.10	$3,327.52	$ 5,409.58
3	$ 5,409.58	$ 811.44	$ 6,221.02	$3,327.52	$ 2,893.50
4	$ 2,893.50	$ 434.02	$ 3,327.52	$3,327.52	$ -

4A17. CALC: n = 10 r = 6.5% PV = ? PMT = $100 FV = 0 **PV = -$718.88**

4A19. CALC: n = 7 r = 9% PV = 0 PMT = $1,500 FV = ? **FV = -$13,800.65**

4A21. CALC: n = 6 r = 10% PV = 0 PMT = $1,000 FV = 0 **PV = -$4,355.26**

4A22. CALC: n = ? r = 0.60% PV = $215,407.67 PMT = -$1,527.27 FV = 0 **n = 313**

4A23. CALC: n = 15 x 12 r = 1% PV = $35,000 PMT = ? FV = 0 **PMT = -$420.06**

4A25. $PV_{Perpetuity} = PMT / r$ PV = $800 / 0.11 = $7,272.73

4A27. CALC: n = 4 x 12 = 48 r = 9% / 12 PV = $15,000 PMT = ? FV = 0 **PMT = -$373.28**

4A28. CALC: n = 5 x 52 = 260 r = 10% / 52 PV = ? PMT = $100 FV = 0 **PV = -$20,445.26**

4A30. CALC: n = 25 x 12 = 300 r = 7.5% / 12 PV = $150,000 PMT = ? FV = 0 **PMT = -$1,108.49**

4B1. a. CALC: n = 10 r = 8% PV = ? PMT = $1,000 FV = 0 **PV = -$6,710.08**
b. CALC: n = 20 r = 8% PV = ? PMT = $1,000 FV = 0 **PV = -$9,818.15**
c. CALC: n = 50 r = 8% PV = ? PMT = $1,000 FV = 0 **PV = -$12,233.48**
d. CALC: n = 100 r = 8% PV = ? PMT = $1,000 FV = 0 **PV = -$12,494.32**
e. $PV_{Perpetuity} = PMT / r = \$1,000 / 0.08 = \$12,500$

4B3. CALC: n = 10 x 12 = 120 r = ? PV = -$69,700.52 PMT = $1,000 FV = 0 **r = 1.0000% per month**
APR = m x r = 12 x 1.0000 = 12.0000% APR

4B4. a. CALC: n = 10 x 52 = 520 r = ? PV = $10,000 PMT = -$31.73 FV = 0 **r = 0.2116%**
b. APR = m x r = 52 x 0.2116% = 11.0022%
c. $APY = (1 + r)^m - 1 = (1 + 0.002116)^{52} - 1 = 11.6172\%$
CALC: n = 52 r = .2116 PV = 100 PMT = 0 FV = ? **FV = -111.6172**

4B7. a. CALC: n = 2 r = 7% PV = ? PMT = 0 FV = 500 **PV = -436.72**
CALC: n = 4 r = 7% PV = ? PMT = 0 FV = -1200 **PV = 915.47**
CALC: n = 5 r = 7% PV = ? PMT = 0 FV = 800 **PV = -570.39**
CALC: n = 6 r = 7% PV = ? PMT = 0 FV = 1500 **PV = -999.51**
Present Value = 436.72 - 915.47 + 570.39 + 999.51 = $1,091.15
b. CALC: n = 5 r = 7% PV = 1091.15 PMT = 0 FV = ? **FV = -1,530.39**
so the combined value at year 5 is $1,530.39
c. CALC: n = 10 r = 7% PV = 1091.15 PMT = 0 FV = ? **FV = -2,146.46**
so the combined value at year 10 is $2,146.46

4B9. a. CALC: n = 2 r = 9% PV = ? PMT = 0 FV = 1300 **PV = -1094.18**
CALC: n = 3 r = 9% PV = ? PMT = 0 FV = 600 **PV = -463.31**
CALC: n = 4 r = 9% PV = ? PMT = 0 FV = 1700 **PV = -1204.32**
Present Value = -1500 + 1094.18 + 463.31 + 1204.32 = $1,261.81
b. CALC: n = 4 r = 9% PV = 1261.81 PMT = 0 FV = ? **FV = -1,781.15**; so the value is $1,781.15
c. CALC: n = 1 r = 9% PV = 1261.81 PMT = 0 FV = ? **FV = -1,375.37**; so the value if $1,375.37

4B11. a. APY = $(1 + APR / m)^m - 1 = (1 + 0.18 / 12)^{12} - 1 = 19.5618\%$
CALC: n = 12 r = 18 / 12 PV = 100 PMT = 0 FV = ? **FV = 119.5618**
b. $FV = PV(1 + r)^n = \$4{,}000(1 + 0.1956)^1 = \$4782.47$
CALC: n = 12 r = 18 / 12 PV = 4000 PMT = 0 FV = ? **FV = 4,782.47**
c. $FV = PV(1 + r)^n = \$4{,}000(1 + 0.1956)^4 = \$8173.42$
CALC: n = 48 r = 18 / 12 PV = 4,000 PMT = 0 FV = ? **FV = 8,173.91**

4B13. At t = 5: CALC: n = 10 r = 10% PV = ? PMT = $1,000 FV = 0 **PV = -$6,144.57**
At t = 0: $PV = FV / (1 + r)^n = \$6{,}144.57 / (1 + 0.10)^5 = \$3{,}815.29$
OR: At t=15: CALC: n = 10 r = 10% PV = 0 PMT = $1,000 FV = ? **FV = -$15,937.42**
At t=0: CALC: n = 15 r = 10% PV = ? PMT = 0 FV = -$15,937.42 **PV = $3,815.29**

4B15. a. $APY = (1 + APR / m)^m - 1 = (1 + 0.15 / 12)^{12} - 1 = 16.0755\%$
CALC: n = 12 r = 15 / 12 PV = 100 PMT = 0 FV = ? **FV = 116.0755**
b. $APY = (1 + APR / m)^m - 1 = (1 + 0.09 / 12)^{12} - 1 = 9.3807\%$
CALC: n = 12 r = 9 / 12 PV = 100 PMT = 0 FV = ? **FV = 109.3807**

4B17. a. CALC: n = 20 x 12 = 240 r = ? PV = $130,000 PMT = -$1,007.89 FV = 0 **r = 0.5833%**
b. APR = m x r = 12 x 0.58% = 7.0000%

4B18. CALC: n = 31 / 12 r = 10% PV = ? PMT = 0 FV = 4,500 **PV = -$3,517.88**

4B21. CALC: n = 4 r = 10% PV = ? PMT = $1,600 FV = 0 **PV = -$5,071.78**
CALC: n = 7 r = 10% PV = -5,071.78 PMT = 0 FV = ? **FV = $9,883.47**

4B25. CALC: n = 3 r = ? PV = -$1,423.56 PMT = 0 FV = $2,000 **r = 12.0000%**

4B26. CALC: n = ? r = 10% PV = -$592.03 PMT = 0 FV = $1,000 **n = 5.4999**

4B31. a. CALC: n = 30 x 12 = 360 r = ? PV = $200,000 PMT = -$2,057.23 FV = 0 **r = 1.0%**
b. APR = m x r = 12 x 1.0% = 12.0%
c. $APY = (1 + r)^m - 1 = (1 + 0.01)^{12} - 1 = 12.6825\%$
CALC: n = 12 r = 1.0000 PV = 100 PMT = 0 FV = ? **FV = 112.6825**

4B33. At t = 9: CALC: n = 7 r = 10% PV = 0 PMT = $1,500 FV = ? **FV = -$14,230.76**
At t = 0: CALC: n = 9 r = 10% PV = ? PMT = 0 FV = -$14,230.76 **PV = -$6,035.23**
OR:
At t = 2: CALC: n = 7 r = 10% PV = ? PMT = $1500 FV = 0 **PV = -$7,302.63**
At t = 0: CALC: n = 2 r = 10% PV = ? PMT = 0 FV = -$7,302.63 **PV = -$6,035.23**

4B34. a. CALC: n = 42 r = 2.5% / 12 PV = $23,000 PMT = ? FV = 0 **PMT = -$572.49**
b. CALC: n = 42 r = 8.3% / 12 PV = ? PMT = -$572.49 FV = 0 **PV = $20,805.02**
The PV of the special financing deal is larger than the $20,500 cash price of the car, so the $2,500 cash back is better than the special financing.
Or, CALC: n = 42 r = 8.3% / 12 PV = $20,500 PMT = ? FV = 0 **PMT = -$564.09**
The payments are less with borrowing from a bank.

Chapter 5

1. A **required return** is a rate of return that would be required to be willing to make an investment. The required return exactly reflects the riskiness of the expected future cash flows of the investment. It reflects the opportunity cost of making the investment. It is the return that the market would require from an investment of identical risk and therefore the required return is determined by market conditions. An **expected return** is a rate of return that is expected to be earned if an investment is made.

2. A stock's capitalization rate is the stock's required return.

3. Coupon payments are the interest payments made on a bond by the firm that issued the bond. A coupon rate determines the coupon payments. It is the percentage of the bond's par value that is paid out in total coupon payments during a year.

4. **Bond indenture**: The legal contract between the issuing corporation and the bondholders.
   Par value: The amount of money that must be repaid by the issuing corporation to the bondholders at the end of the bond's life.
   Principal: The total amount of money being borrowed.
   Maturity: The amount of time until end of the bond's life. *Original maturity* is the amount of time the bond is scheduled to exist. *Remaining maturity* is the amount of time remaining until the end of the bond's life. Often remaining maturity is referred to simply as maturity.
   Call provision: Allows the issuing firm to pay off the bonds prior to their maturity.
   Sinking fund: A provision that requires the bonds to be repaid in multiple installments that are specified in the indenture.

5. A payout ratio is the amount a firm pays out in cash dividends divided by the firm's earnings during the same time period.

6. The method for valuing any asset is to calculate the present value of its expected future cash flows.

7. The par value on most U.S. corporate bonds is $1,000, and they usually pay interest every six months (twice a year).

8. A bond quote of 102 indicates a price that is 102% of the bond's par value. Assuming this is a U.S. corporate bond ($1,000 par value), the bond's price would be $1,020.

9. The yield to call is the expected return a bondholder will receive if a bond issuer exercises its call option to redeem the bond before maturity. The yield to call is a more reasonable estimate of the expected return than the yield to maturity when the price of the bond is greater than its call price.

11. Interest rate risk is the risk that the price of a bond will change because of a change in the required return. For instance, if interest rates in the economy rise, the value of a bond will fall. Interest rate risk increases with longer maturity mainly because a change in the required return will have a larger effect on the principal repayment of a longer maturity bond. Higher coupon rates will reduce the interest rate risk because a greater percentage of the value of the bond is received in the early years.

13. One reason a P/E ratio may not be a good predictor of future stock performance is that it is based on historical earnings and not estimates of future earnings. Another problem with the P/E ratio is that earnings can have high variance while firm value remains stable, thus causing the P/E ratio to fluctuate even the firm's future prospects have not changed. Finally, the P/E ratio is based on accounting earnings which may not accurately reflect the timing of income.

15. The growth rate, g, can never be greater than the required return, r. If g was greater than r, the firm would be growing faster than the entire economy *forever*. If this happened, the firm eventually would become the only firm in the economy. After that, its growth would have to slow down and would be only the growth of the economy. In addition, the model breaks down mathematically and would produce an obviously incorrect value, which would be negative (or infinite if g equaled r).

5A2. CALC: n = 11.5x2 = 23 r = 9.2%/2 = 4.6% PV = ? PMT = 6.25%x1000/2 = $31.25 FV = $1,000
PV = -$793.32

5A5. CALC: n = 8.5x2 = 17 r = 8.0%/2 = 4.0% PV = ? PMT = 6.75%x1000/2 = $33.75 FV = $1,000
PV = -$923.96

5A7.a. CALC: n = 15x2 = 30 r = ? PV = -$1,120 PMT = 9.2%x1,000/2 = $46.00 FV = $,1000 **r = 3.9133%**
YTM = 3.9133% x 2 = 7.8266%
b. CALC: n = 15x2 = 30 r = ? PV = -$1,000 PMT = 9.2%x1,000/2 = $46.00 FV = $1,000 **r = 4.6000%**
YTM = 4.60% x 2 = 9.20%
c. CALC: n = 15x2 = 30 r = ? PV = -$785 PMT = 9.2%x1,000 / 2 = $46.00 FV = $1,000 **r = 6.1946%**
YTM = 6.1946% x 2 = 12.3892%

5A17. $PV_{Perpetuity} = D / r = \$1.00 / 0.03 = \$33.33$

5B3. CALC: n = 22 r = ? PV = -$952.50 PMT = 8.75% x 1,000 / 2 = $43.75 FV = $1,000 **r = 4.7269%**
YTM = 4.7269% x 2 = 9.4539%
$APY = (1 + r)^m - 1 = (1 + 0.047269)^2 - 1 = 9.6773\%$
CALC: n = 2 r = 4.7269 PV = 100 PMT = 0 **FV = 109.6773** APY = 9.6773%

5B4. CALC: n = ? r = 10.0% / 2 = 5.0% PV = -$951.30 PMT = 9.375% x 1,000 / 2 = $46.875 FV = $1,000 **n = 31** semiannual periods (actually 30.9591); so the bonds mature in 31/2 = 15.5 years

5B5. a. CALC: n = 14 x 2 =28 r = 8.0% / 2 = 4.0% PV = ? PMT = 10.5% x 1,000 / 2 = $52.50 FV = $1,000
PV = -$1,208.29
b. CALC: n = 14x2 = 28 r = ? PV = -$1,090 PMT = 10.5%x1,000/2 = $52.50 FV = $1,000 **r = 4.6675%**
YTM = 4.6675% x 2 = 9.3351%
c. CALC: n = 4x2 = 8 r = ? PV = -$1,090 PMT = 10.5% x 1,000 / 2 = $52.50 FV = $1,080 **r = 4.7195%**
YTC = 4.7195% x 2 = 9.4389%

5B13. a. 1. CALC: n = 2 x 2 = 4 r = 9% / 2 = 4.5% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$968.61**
2. CALC: n = 5 x 2 = 10 r = 9% / 2 = 4.5% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$930.76**
3. CALC: n = 10 x 2 = 20 r = 9% / 2 = 4.5% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$886.18**
4. CALC: n = 20 x 2 = 40 r = 9% / 2 = 4.5% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$838.99**
b. 1. CALC: n = 2 x 2 = 4 r = 10% / 2 = 5% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$951.24**
2. CALC: n = 5 x 2 = 10 r = 10% / 2 = 5% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$893.83**
3. CALC: n = 10 x 2 = 20 r = 10% / 2 = 5% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$828.64**
4. CALC: n = 20 x 2 = 40 r = 10% / 2 = 5% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$764.06**
c. 1. CALC: n = 2 x 2 = 4 r = 8% / 2 = 4% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$986.39**
2. CALC: n = 5 x 2 = 10 r = 8% / 2 = 4% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$969.58**
3. CALC: n = 10 x 2 = 20 r = 8% / 2 = 4% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$949.04**
4. CALC: n = 20 x 2 = 40 r = 8% / 2 = 4% PV = ? PMT = 7.25% x 1,000 / 2 = $36.25
FV = $1,000 **PV = -$925.78**
d. Interest-rate risk varies directly with maturity. The longer maturity of the bonds, the larger the price change is when interest rates change.

5B18. a. $P_1 = D_2 / (r - g) = \$1.00 / (0.13 - 0.06) = \$14.29$
$P_0 = \$14.29 / (1 + 0.13)^1 = \$12.64$
b. $P_3 = D_4 / (r - g) = \$1.00 / (0.13 - 0.04) = \$11.11$
$P_0 = \$11.11 / (1 + 0.13)^3 = \$7.70$

5B19. $PV = \$1.00 / (1 + 0.10)^1 + \$1.00 / (1 + 0.10)^2 + \$2.00 / (1 + 0.10)^3 + \$2.00 / (1 + 0.10)^4 + \$2.00 / (1 + 0.10)^5 + +\$40.00 / (1 + 0.10)^6$
$PV = \$0.91 + \$0.83 + \$1.50 + \$1.37 + \$1.24 + \$22.58 = \$28.43$

5B20. $D_0 = \$1.00$
$D_1 = \$1.00 \times (1 + 0.40) = \$1.40$
$D_2 = \$1.40 \times (1 + 0.40) = \$1.96$
$D_3 = \$1.96 \times (1 + 0.40) = \$2.74$
$D_4 = \$2.74 \times (1 + 0.05) = \$2.88$
$P_3 = D_4 / (r - g) = \$2.88 / (0.14 - 0.05) = \$32.00$
$P_0 = \$1.40 / (1 + 0.14)^1 + \$1.96 / (1 + 0.14)^2 + \$2.74 / (1 + 0.14)^3 + \$32.00 / (1 + 0.14)^3$
$P_0 = \$1.23 + \$1.51 + \$1.85 + \$21.60 = \$26.20$

5B21. $EPS_6 = \$0.25 \times (1 + 4.00) \times (1 + 0.75) \times (1 + 0.75) \times (1 + 0.75) \times (1 + 0.03) \times (1 + 0.03) = \$7.11$
D_1 to $D_5 = \$0.10$
$D_6 = 80\% \times EPS_6 = 80\% \times \$7.11 = \$5.69$
$P_5 = D_6 / (r - g) = \$5.69 / (.32 - .03) = \$19.62$
CALC: n = 5 r = 32% PV = ? PMT = $0.10 FV = $19.62 **PV = -$5.13**

5B23. $r = D_1 / P_0 + g = \$0.75 / \$47.00 + 0.015 = 3.10\%$

5B24. $D_1 = \$1.00$
$D_2 = \$1.00 \times (1 + 0.25) = \$1.25$
$D_3 = \$1.25 \times (1 + 0.25) = \$1.56$
$D_4 = \$1.56 \times (1 + 0.25) = \$1.95$
$D_5 = \$1.95 \times (1 + 0.04) = \$2.03$
$P_4 = \$2.03 / (r - 0.04)$

R = 10.58%

Year	CF	PV
1	$ 1.00	$ 0.90
2	$ 1.25	$ 1.02
3	$ 1.56	$ 1.15
4	$ 1.95	$ 1.30
4	$30.83	$20.62
	Total =	$25.00
	Price =	$25.00
	NPV =	$ 0.00

Use Excel's Solver or Goal Seek function under the Data, Tools, What-If Analysis menu to solve by setting NPV equal to zero by changing r. The PV values and the P_4 value must be functions of r so that they change when r changes.

Chapter 6

6. The CML (capital market line) is a line that connects the riskless return to the efficient frontier at point M. It represents various percentages of capital invested in the riskless asset and the market portfolio. The line can be extended past point M to represent borrowing at the riskless return and investing the proceeds in M. The line produces a better risk-return relationship than the portfolios that are on the efficient frontier.

7. If two investments with positive expected returns have perfect negative correlation, an investment in both assets will produce a riskless return. The reason is that when the return of one asset is high, the return of the other asset is low. When the assets are combined in the right proportions, the high and low returns will cancel out each other exactly and the portfolio will produce a return with zero standard deviation.

9. The fallacy is that the investor has experienced a real loss even though the stock has not yet been sold. At this point, the investor has a realized holding period return of minus 33.33%. This is a loss of $10 per share and it is not necessary to sell the stock to know that there has been a loss. The investor has suffered an opportunity cost because the funds might have been invested elsewhere. The confusion in this case may arise because of the tax rule that says the loss *for tax purposes* is recognized only if the stock is sold. Despite the tax rule, we can assure you the investor has suffered a loss!

6A1. Total Market Value = \$3,000 + \$2,000 + \$1,000 + \$1,500 = \$7,500
w_1 = \$3,000 / \$7,500 = 40%
w_2 = \$2,000 / \$7,500 = 26.67%
w_3 = \$1,000 / \$7,500 = 13.33%
w_4 = \$1,500 / \$7,500 = 20%

6B1. The dividends come 83, and 174 days before the date of sale. The sale is after 196 days.
$PV = FV / (1 + r)^n$
Sale price = $\$32.50(1.15)^{196/365} - \$1.15(1.15)^{83/365} - \$1.15(1.15)^{174/365}$
Sale Price = \$32.62

6B7. The dividend comes 20 days following the date of purchase. The sale comes after 87 days.
$PV = FV / (1 + r)^n$
$PV = \$0.35/(1 + 0.50)^{20/365} + \$22.75/(1 + 0.50)^{87/365} = \$21.00$

6B9. a. CML slope = $(r_M - r_F)/\sigma_M = (10\% - 4\%)/15\% = 0.40$

b. $r_p = w_1 r_1 + (1 - w_1) r_2$

$13\% = w_1 4\% + (1 - w_1)10\%$, so $w_1 = -0.50$. She needs to borrow \$50,000 (50% of the amount she has) at 4%, and invest the \$150,000 (150% of the amount she has) at 10%.
Her expected return will then be be -0.50(4%) + 1.50(10%) = 13%.

c. Her portfolio standard deviation is $\sigma_p = \left\{ w_1^2 \sigma_1^2 + (1 - w_1)^2 \sigma_2^2 + 2 w_1 (1 - w_1) Corr(R_1, R_2) \sigma_1 \sigma_2 \right\}^{1/2}$

Because σ_1^2 and $Corr(R_1, R_2)$ are both equal to zero, the standard deviation of her investment simplifies to

$$\sigma_p = \left\{ (1 - w_1)^2 \sigma_2^2 \right\}^{1/2} = \left\{ 1.5^2 (15\%)^2 \right\}^{1/2} = 1.5(15\%) = 22.5\%$$

Chapter 7

2. The market price of risk refers to the market risk premium, $r_m - r_f$. It is a measure of the extra return required for undertaking a unit of market risk.

8. A simple way to look at this is that the market need not pay for taking risk that can be easily and virtually costlessly eliminated. Another way to view this is that the market will not pay investors for taking on diversifiable risk because prices are set by diversified investors. Diversified investors will value an asset at a higher price than a nondiversified investor because diversified investors have lower risk and therefore a lower required return. Based on the Principle of Self-Interested Behavior, people will sell to the highest bidders. Thus a nondiversified investor buying at these prices can only expect to make the required return set by a diversified investor.

10. Both statements are correct. Both σ and β measure the risk of investing. σ, the standard deviation of returns, measures the risk of holding an asset by itself. β, the covariance of an asset to the market portfolio divided by the variance of the market's return, measures the risk of holding an asset in a diversified portfolio. Since diversified investors set prices, β should be used.

7A6. $r = r_f + \beta(r_M - r_f)$
$r = 0.07 + 1.35 \times (0.12 - 0.07) = 0.1375 = 13.75\%$

7B1. $r = r_f + \beta(r_M - r_f)$
$0.17 = 0.07 + 1.4(r_M - 0.07)$
$0.198 = 1.4 \times r_M$
$r_M = 0.1414 = 14.14\%$

7B4. $r = r_f + \beta(r_M - r_f)$
$\beta = Corr(j,M)\sigma_j / \sigma_M$
$\sigma_j = 0.12^{1/2} = 0.3464$
$\sigma_M = 0.002^{/2} = 0.0447$
$\beta = 0.60 \times 0.3464 / 0.0447 = 4.65$
$r = 0.055 + 4.65 \times (0.15 - 0.055) = 0.4968 = 49.68\%$

Chapter 8

2. If the IRR of a project exactly equals the cost of capital, the NPV will be zero.

3. Present value depends on the amount of the future cash flows and the cost of capital.

4. Operating leverage is the mix of fixed and variable costs required to produce a product or service. Financial leverage is the mix of debt and equity used in financing an asset.

9. Even though the expected return is less than the weighted average cost of capital, the project does not have a negative NPV. In fact, this purely financial investment would have a zero NPV because of the principle of capital market efficiency. The problem is that the project's cost of capital must be adjusted for the risk of the project. It should not based on the weighted average cost of capital of the entire firm unless the project's risk is similar to the risk of the firm as a whole. In this case, the WACC is irrelevant.

10. The firm should go ahead with the investment. The cost of capital to be used when evaluating the investment is 15% because the investment has the same risk as the market, $r = r_f + \beta(r_m - r_f) = 10\% + 1.0(15\% - 10\%) = 15\%$. Since the IRR is 18%, the project has a positive NPV.

12. The chairman is WRONG! The cost of debt is always lower than the cost of equity—because of the risk return tradeoff, debt is bearing less risk than equity, so it has a lower required return. In fact, the firm's cost of capital will not change whether the firm issues equity or the "cheaper" debt. The reason is that the cost of capital is determined primarily by the risk of the investment—not the mix of financing. Besides, a change in financial risk will occur when the firm issues new securities in a different proportion from the current financing mix. If the firm issues a large level of debt, the debtholders will require a higher yield to offset the increase in risk as will the equityholders too, and the firm's weighted *average* cost of capital will remain unchanged.

8A1. a. $r = r_f + \beta(r_m - r_f)$
$r_A = 9\% + 1.00(15\% - 9)\% = 15.00\%$ N=12 r=15 PV=? PMT=310 FV=0 PV=-1680.3919
$NPV_A = -\$1,500 + \$1,680.3919 = \$180.3919$
$r_B = 9\% + 2.25(15\% - 9)\% = 22.50\%$ N=8 r=22.5 PV=? PMT=310 FV=0 PV=-1783.9956
$NPV_B = -\$1,500 + \$1,783.9956 = \$283.9956$
$r_C = 9\% + 2.22(15\% - 9)\% = 22.32\%$ N=7 r=22.32 PV=? PMT=435 FV=0 PV=-1473.2471
$NPV_C = -\$1,500 + \$1,473.2471 = -\$26.7529$
$r_D = 9\% + 0.65(15\% - 9)\% = 12.90\%$ N=11 r=12.9 PV=? PMT=270 FV=0 PV=-1542.0371
$NPV_D = -\$1,500 + \$1,542.0371 = \$42.0371$
$r_E = 9\% + 1.37(15\% - 9)\% = 17.22\%$ N=10 r=17.22 PV=? PMT=385 FV=0 PV=-1779.3043
$NPV_E = -\$1,500 + \$1,779.3043 = \$279.3043$
$r_F = 9\% + 2.36(15\% - 9)\% = 23.16\%$ N=9 r=23.16 PV=? PMT=405 FV=0 PV=-1480.4858
$NPV_F = -\$1,500 + \$1,480.4858 = -\$19.5142$
b. Projects A, B, D, and E should be undertaken.

8A2. $WACC = (1 - L)r_e + L(1 - T)r_d$
$WACC = (1 - 0.35) \times 14\% + 0.35(1 - 0.40) \times 8\% = 10.78\%$

8B10. a. CALC: n = 20 PV = -\$1,050 PMT = (10% x \$1,000)/2 = \$50 FV = \$1,000 **r = 4.6119%**
YTM = 2 x r = 9.2238%; After-tax $r_d = (1 - 0.40)9.2238\% = 5.53\%$
b. $r_e = r_f + \beta(r_M - r_f) = 6\% + 1.30(14\% - 6\%) = 16.40\%$
c. $L = D / (D + E) = 10{,}000 \times \$1{,}050 / (10{,}000 \times \$1{,}050 + 400{,}000 \times \$40) = 0.3962$
$WACC = (1 - L)r_e + L(1 - T)r_d = (1 - 0.3962)16.40\% + 0.3962(1 - 0.40)9.2238\% = 12.09\%$

8B11. Total Dollar Return = 20% x \$4,000 + 12% x \$6,000 = \$1,520
r = 1,520/10,000 = 15.2%

8B12. Dollar Profit = 15% x \$70,000 = \$10,500
Interest Expense = 9% x \$45,000 = \$4,050
Net Profit = 10,500 – 4050 = \$6,450
r = 6,450/25,000 = 25.80%

Chapter 9

2. The Principal of Valuable Ideas is of critical importance to the capital budgeting process because new ideas may become positive-NPV projects that will add value to the firm. New ideas will likely be the source of a firm's most valuable projects.

6. The profitability index is the PV of a project's future cash flows divided by the initial investment. The basic concept is that if the PV is greater than the initial investment (PI > 1) the project should be accepted.

7. Payback is the amount of time needed to recoup the original investment in a project. The concept is that the quicker a project pays for itself, the better it is.

8. The internal rate of return is a project's expected return. It is the cost of capital, or required return, that will make the NPV of a project equal to zero.

13. The NPV profile is the best method to use because it provides a complete picture of the project and incorporates both the NPV and the IRR. The NPV profile also shows the sensitivity of the value of the project to the required return.

9A5. a. Payback = 1 year
NPV = -\$100 + \$100 / $(1 + 0.10)^1$ = -\$100 + \$90.91 = -\$9.09
\$0 = -\$100 + \$100 / $(1 + IRR)^1$
IRR = \$100 / \$100 – 1 = 0%
b. This is not a profitable investment.

9A7. NPV = -\$200,000 + \$100,000 / $(1 + 0.10)^1$ + \$100,000 / $(1 + 0.10)^2$ + \$150,000 / $(1 + 0.10)^3$
NPV = -\$200,000 + \$90,909 + \$82,645 + \$112,697 = \$86,251
CALC: n = 3 r = ? PV = -\$200,000 PMT = \$100,000 FV = \$50,000 **r = 31.4461%** IRR = 31.4461%
Payback: \$100,000 + \$100,000 = \$200,000
Payback = 2 years

9A9. a. CALC: n = 6 r = 10% PV = ? PMT = \$14,000 FV = \$27,000 - \$14,000 = \$13,000 **PV = -\$68,311.81**
You can invest up to \$68,311.81 and still have a positive NPV.
b. CALC: n = 6 r = 15% PV = ? PMT = \$14,000 FV = \$27,000 - \$14,000 = \$13,000 **PV = -\$58,603.02**
You can invest up to \$58,603.02 and still have a 15% IRR.

9B2. a. \$0 = \$100 - \$100 / $(1 + r)^1$
IRR = -\$100 / -\$100 - 1 = 0%
b. NPV = \$100 - \$100 / $(1 + 0.10)^1$ = \$100 - \$90.91 = \$9.09
c. Yes. The project should be accepted.

9B4. a. Payback: 150/52 = 2.88 years
b. N=5 I=14 PV=? PMT=52 FV=29-52=-23 **PV=-166.5747**; NPV = 166.5747 – 150 = \$16.5747
c. N=5 I=? PV=-150 PMT=52 FV=29-52=-23 **I=18.7968**

9B6. a. CALC: n = 6 r = 12% PV = ? PMT = \$8.0 FV = 0 **PV = -\$32.89**
NPV = -\$43 + \$32.89 = -\$10.11 million
b. -\$10.11 / 3 = -\$3.37 per share.

9B11. a. CALC: n = 6 r = 12% PV = ? PMT = \$40,000 FV = 0 **PV = -\$164,456.29**
NPV = -\$125,000 + \$164,456.29 = \$39,456.29
b. Outlay = \$125,000 x (1 + 0.10) = \$137,500; Inflows = \$40,000 x (1 - 0.05) = \$38,000
CALC: n = 5 r = 12% PV = ? PMT = \$38,000 FV = 0 **PV = -\$136,981.50**
NPV = -\$137,500 + \$136,981.50 = -\$518.50

Chapter 10

1. Cash flow. Incremental. After-tax. Ignored.

3. Sunk costs should be excluded from a capital budgeting analysis because they are irrelevant to the decision. Sunk costs have already been spent and cannot be recovered whether the project is accepted or rejected, expanded or contracted, continued or abandoned.

7. Financing charges are not normally accounted for in the cash flows of a capital budgeting analysis. Rather, financing charges are explicitly included in the discount rate, the required return for the project.

8. Change in net working capital is an important cash flow in the capital budgeting process because of the opportunity cost associated with using the cash for that project. The cash used for working capital in a project could have been used to finance another project, could have been invested in bonds, or could have been used to pay down debt. The time value of money captures this cost in the present value difference between the money put in at the start and recovered at the end of the project.

10. Taxes are large expenses for firms. Current tax laws are important to the evaluation of a capital investment project because they can affect the value of the project. A change in tax laws could potentially turn a positive NPV project into a negative NPV project, and tax laws change frequently.

16. Absolutely not! Although the firm would lose the depreciation tax shields, it would not pay taxes. The taxes are much larger than the depreciation tax shields. Therefore, zero taxes would result in a higher NPV.

10A1. Net Investment Outlay = -I - ΔW + S - T(S - B)
Net Investment Outlay = -($70,000 + $8,000) - $15,000 + $7,000 - 0.30($7,000 - $15,000) = -$83,600

10A4. ΔNet Working Capital = ΔCurrent Assets - ΔCurrent Liabilities
ΔNet Working Capital = ($30 + $15) - $8 = $37 million

10A10. CALC: n = 7 r = 11% PV = $73,285 PMT = ? FV = 0 **PMT = -$15,552.20;** EAC = $15,552.20

10A11. 4 Year: $PV = -\$10{,}000 + \$3{,}800 / (1 + 0.12)^4 = -\$7{,}585.03$
CALC: n = 4 r = 12% PV = -$7,585.03 PMT = ? FV = 0 **PMT = $2,497.25**
5 Year: $PV = -\$10{,}000 + \$2{,}800 / (1 + 0.12)^5 = -\$8{,}411.20$
CALC: n = 5 r = 12% PV = -$8,411.20 PMT = ? FV = 0 **PMT = $2,333.35**
6 Year: $PV = -\$10{,}000 + \$1{,}000 / (1 + 0.12)^6 = -\$9{,}493.37$
CALC: n = 6 r = 12% PV = -$9,493.37 PMT = ? FV = 0 **PMT = $2,309.03**
7 Year: $PV = -\$10{,}000 - \$1{,}000 / (1 + 0.12)^7 = -\$10{,}452.35$
CALC: n = 7 r = 12% PV = -$10,452.35 PMT = ? FV = 0 **PMT = $2,290.30**
The optimal replacement cycle is 7 years because it has the lowest EAC.

10B7. By-item format:

Time	Item	BTCF	ATCF	PV @ 10%
0	Capitalized machine cost	-65,000	-65,000	-65,000
0	Sale of old machine	30,000	38,000	38,000
1-5	Depreciation, new	0	4,800/yr	18,195.78
1-5	Depreciation, lost	0	-4,000/yr	-15,163.15
1-5	Change in revs minus expenses	15,000/yr	9,000/yr	34,117.08
5	Salvage	5,000	5,000	3,104.61
			NPV =	$13,254.32

Yearly cash flow format:

Old Machine: R = $60,000 E = $30,000 D = $50,000 / 5 = $10,000 S = $30,000 B = $50,000

New Machine: I = $65,000 R = $70,000 E = $25,000 D = ($65,000 - $5,000) / 5 = $12,000

Incremental: ΔR = $70,000 - $60,000 = $10,000 ΔE = $25,000 - $30,000 = -$5,000

ΔD = $12,000 - $10,000 = $2,000

$CFAT_0$ = Net Investment Outlay = $-I - \Delta W + S - T(S - B)$

$CFAT_0$ = -$65,000 - 0 + $30,000 - .40($30,000 - $50,000) = -$27,000

$CFAT_{1 \text{ to } 4} = (\Delta R - \Delta E)(1 - T) + T\Delta D$ = ($10,000 - -$5,000)(1 - 0.40) + 0.40 x $2,000 = $9,800

Net Salvage Value = $S - T(S - B) - (1 - T)REX + \Delta W$ = $5,000 - 0.40($5,000 - $5,000) = $5,000

$CFAT_5$ = $9,800 + $5,000 = $14,800

$NPV = -\$27{,}000 + \$9{,}800 / 1.10^1 + \$9{,}800 / 1.10^2 + \$9{,}800 / 1.10^3 + \$9{,}800 / 1.10^4 + \$14{,}800 / 1.10^5$

NPV = $13,254.32

10B10. By-item format:

Time	Item	BTCF	ATCF	PV@13%
0	Capitalization	-100,000	-100,000	-100,000
0	Setup costs	-8,000	-4,800	-4,800
0	Δ Working capital	-12,000	-12,000	-12,000
1-6	Depreciation	0	6,666.67	26,650.35
7	Overhaul	-14,000	-8,400	-3,570.51
1-10	ΔR-ΔE	55,000	33,000	179,066.03
10	Salvage value .	30,000	18,000	5,302.59
10	Δ Working capital	12,000	12,000	3,535.06
				$ 94,183.52

Yearly cash flow format:

Net Investment Outlay = $-I - \Delta W + S - T(S - B)$

Net Investment Outlay = -($100,000 + $8,000 x (1 - 0.40)) - $12,000 = -$116,800

$CFAT_{1 \text{ to } 6} = (\Delta R - \Delta E)(1 - T) + T\Delta D$

D = $100,000 / 6 = $16,666.67

$CFAT_{1 \text{ to } 6}$ = $55,000(1 - 0.40) + 0.40 x $16,666.67 = $39,666.67

$CFAT_7$ = $55,000(1 - 0.40) - $14,000x (1 - 0.40) = $24,600

$CFAT_{8 \text{ to } 9}$ = $55,000(1 - 0.40) = $33,000

Net Salvage Value = $S - T(S - B) - (1 - T)REX + \Delta W$

Net Salvage Value = $30,000 - 0.40($30,000 - $0) + $12,000 = $30,000

$CFAT_{10}$ = $33,000 + $30,000 = $63,000

$NPV = -\$116{,}800 + \$39{,}666.67 / 1.13^1 + \$39{,}666.67 / 1.13^2 + \$39{,}666.67 / 1.13^3 + \$39{,}666.67 / 1.13^4 + \$39{,}666.67 / 1.13^5 + \$39{,}666.67 / 1.13^6 + \$24{,}600 / 1.13^7 + \$33{,}000 / 1.13^8 + \$33{,}000 / 1.13^9 + \$63{,}000 / 1.13^{10}$

NPV = $94,183.52

10B11. By-item format:

Time	Item	BTCF	ATCF	PV@16%
0	Capitalization	-6,000,000	-6,000,000	-6,000,000
0	Δ Working capital	-500,000	-500,000	-500,000
1-2	ΔR-ΔE	5,000,000	3,250,000	5,217,004
3-6	ΔR-ΔE	3,000,000	1,950,000	4,055,033
1-6	Depreciation	0	262,500	967,243
6	Salvage value .	0	525,000	215,482
6	Δ Working capital	500,000	500,000	205,221
				$ 4,159,983

Yearly cash flow format:
Net Investment Outlay = -I - ΔW + S - T(S - B)
Net Investment Outlay = -$6,000,000 - $500,000 = -$6,500,000
$CFAT_{1\ to\ 2}$ = (ΔR - ΔE)(1 - T) + TΔD
D = $6,000,000 / 8 = $750,000
$CFAT_{1\ to\ 2}$ = $5,000,000(1 - 0.35) + 0.35 x $750,000 = $3,512,500
$CFAT_{3\ to\ 5}$ = $3,000,000(1 - 0.35) + 0.35 x $750,000 = $2,212,500
Net Salvage Value = S -T(S - B) - (1 - T)REX + ΔW
B = $6,000,000 - 6 x $750,000 = $1,500,000
Net Salvage Value = $0 - 0.35($0 - $1,500,000) + $500,000 = $1,025,000
$CFAT_6$ = $2,212,500 + $1,025,000 = $3,237,500
NPV = -$6,500,000 + $3,512,500 / 1.16^1 + $3,512,500 / 1.16^2 + $2,212,500 / 1.16^3 +
$2,212,500 / 1.16^4 + $2,212,500 / 1.16^5 + $3,237,500 / 1.16^6
NPV = $4,159,982.93

10B14. The easiest way to calculate the NPV is to discount cash flows in real terms using a cost of capital in real terms and discount cash flows in nominal terms using a cost of capital in nominal terms:

Time	Item	BTCF	ATCF	PV	
0	Initial Cost	$(350,000.00)	$(350,000.00)	$(350,000.00)	
1 to 8	ΔR - ΔE	$ 100,000.00	$ 60,000.00	$ 344,798.34	@ 8%
1 to 8	Depreciation	$ -	$ 12,000.00	$ 56,805.20	@13.4%
8	Salvage	$ 110,000.00	$ 110,000.00	$ 40,224.28	@ 13.4%
				NPV = $ 91,827.82	

PV of ΔR - ΔE: CALC: n = 8 r = 8% PV = ? PMT = $60,000 FV = 0 **PV = -$344,798.34**
Depreciation = ($350,000 - $110,000)/8 = $30,000
After-tax = 0.40 x $30,000 = $12,000
PV of Depreciation: CALC: n = 8 r = 13.4% PV = ? PMT = $12,000 FV = 0 **PV = -$56,805.20**
The discount rate for depreciation is r_n = (1 + 0.08)(1 + 0.05) -1 = 13.4%

Here is the calculation all in nominal terms:

Time	BTCF	ATCF	PV
0	$(350,000.00)	$(350,000.00)	$(350,000.00)
1	$ 105,000.00	$ 75,000.00	$ 66,137.57
2	$ 110,250.00	$ 78,150.00	$ 60,771.91
3	$ 115,762.50	$ 81,457.50	$ 55,858.84
4	$ 121,550.63	$ 84,930.38	$ 51,358.32
5	$ 127,628.16	$ 88,576.89	$ 47,234.05
6	$ 134,009.56	$ 92,405.74	$ 43,453.08
7	$ 140,710.04	$ 96,426.03	$ 39,985.53
8	$ 147,745.54	$ 100,647.33	$ 36,804.24
8	$ 110,000.00	$ 110,000.00	$ 40,224.28
			NPV = $ 91,827.82

BTCF = (ΔR - ΔE)$(1 + 0.05)^n$ to adjust for inflation.
ATCF = BTCF(1 - T) + TΔD except for the salvage value.

10B20. First, find the total cost of operating each machine. Then find the EAC for each machine.

Machine A	Time	Item	CFBT	CFAT	PV@13%
	0	Capitalization	-50,000	-50,000	-50,000
	1-6	)E	-34,000	-22,100	-88,346
	1-6	Depreciation	0	2,917	11,661
					TC = -$126,685

Machine B	Time	Item	CFBT	CFAT	PV@13%
	0	Capitalization	-70,000	-70,000	-70,000
	1-5	)E	-26,000	-16,900	-59,441
	1-5	Depreciation	0	4,900	17,234
					TC = -$112,207

Machine A EAC = $31,691: N=6 r=13 PV=126,685 **PMT=31,691** FV=0
Machine B EAC = $31,902: N=5 r=13 PV=112,207 **PMT=31,902** FV=0
Choose machine A since its EAC is lower.

Chapter 11

4. Capital rationing can be used for managerial planning because the limit on spending for capital budgeting projects allows managers to know exactly how much capital they need to raise and how much capital they have to spend. It also helps managers in selecting projects because they know they must pick only the most profitable projects.

5. Postaudits are important because actual cash flows can be compared to the estimates. This comparison can help improve the ability of the analysts that made the estimates. One of the pitfalls of postaudits is the difficulty in measuring opportunity costs and options. Also, measuring and identifying cash flows from a decision may be impossible.

6. The pricing of a product has significant implications on capacity because price affects demand. If a firm raises the price of its product, it will sell less of the product. Likewise, if a firm lowers the price, it will sell more of the product. The pricing of a product can affect the decision of whether to expand or not because the decision to raise the price and not expand may have a higher NPV than the decision to keep pricing constant and expand plant capacity.

7. Abandonment is important to firms engaged in capital rationing because of opportunity costs. A firm engaged in capital rationing may choose to abandon a positive NPV project and invest the proceeds in a project with an even greater NPV. A firm not using capital rationing would simply invest in both projects.

9. Both statements are correct. The value of a project is its NPV. The last chapter estimated NPV as the present value of a project's cash flows. This chapter expands the concept to include other potential cash flows that may result from the options associated with the undertaking of a project.

12. The firm that has "discovered" the large positive-NPV project should double-check its analysis and come up with a reason why it is better able to use the assets than the firm that currently owns them. If the project has such a large NPV, why hasn't the other firm used the assets in that type of project? Also, if the large NPV really exists, the offer to buy the assets may send a signal to the selling the firm that the assets are more valuable than previously thought.

14. A lower level manager may have a more narrow opinion of the project than upper level management. To the lower level manager, the project may appear to have a positive NPV, however it may not fit in the strategic vision of upper level management. Perhaps, upper level management has decided to abandon the lower level manager's division. Maybe the project will cause erosion to other projects that upper level management believes have great future investment opportunities. Upper level management is better able to evaluate the project within their strategic vision for the corporation.

15. A poorly performing subsidiary is unlikely to receive a high sales price. Due to the Principle of Two-Sided Transactions, the buyer will only pay what the subsidiary is worth. In any case, if the subsidiary is losing money and has little chance of profitability, it may be hard or even impossible to find a buyer. Therefore, in most cases the firm's loss can't be limited by selling the subsidiary because the loss has already occurred.

11B6. CALC: n = 10 r = 12% PV = ? PMT = $150,000 FV = 0 **PV = -$847,533.45**
Sell because the abandonment value of $1 million is larger than the value of the cash flows.

11B8. CFAT = $200,000 x (1 - 0.40) - $25,000 = $95,000
$PV_{Perpetuity}$ = CF/r = $95,000/0.15 = $633,333.33
Abandonment Value = $540,000 + $80,000 + $7,000 = $627,000
NPV = $627,000 - $633,333.33 = -$6,333.33

Chapter 15

11. Some information, such as dividend and earnings announcements, occurs at regular intervals and is anticipated by the market participants. Market participants may be very skilled in anticipating the information, causing the market prices to reflect the information before it is even announced. Some information, such as a natural disaster destroying a plant, is unanticipated and completely random. The market cannot react until after the event occurs. It is important to distinguish between them because traders can try to profit from anticipated information by using other methods to gather and forecast the information before it is formally announced to the public. In that way they may be able to make money on the change in the market price when the new information is formally announced and incorporated into the market price.

14. Asymmetric taxes, asymmetric information, and transaction costs are capital market imperfections that can impact corporate decisions. Asymmetric taxes mean that the parties to a transaction have different tax treatment, such as having different rates or even methods of taxation. Because of this, both parties can be better or worse off because they make a transaction in a particular way. For example, asymmetric taxes can make it beneficial to both a corporation and its investors to use at least some debt contracts for the investment in the corporation. Thus, asymmetric taxes can affect the type of security a corporation decides to issue. Asymmetric information means that participants do not all have the same information. In such cases, if participants refuse to make transactions, market prices may be incorrect. For example, participants might refuse to purchase new shares of stock unless they believe they are buying the stock for less than its true value. Thus, asymmetric information might cause a firm to use internal rather than external financing for a capital budgeting project. Transaction costs are the time, effort, and money required to make a transaction. Transactions costs discourage transactions because they reduce the value of a transaction by "draining" of part of its value. For example, transaction costs usually make it better for a corporation to borrow larger amounts of money less frequently, even if some of the borrowed money must be temporarily invested in low return/low risk investments. Thus, transaction costs might cause a corporation to temporarily alter its capital structure.

16. Arbitrage is important to the efficiency of the capital markets because it ensures that prices for a particular asset will not differ very much among the various markets where the asset is traded.

17. The answer is false. The larger the difference in the purchase and sale prices, the more incentive there is for other people (including other arbitrageurs) to make trades that cause the prices to come together. If there were large differences to profit from, many people will enter the market and make trades that eliminate the arbitrage opportunity. Therefore, in practice, the difference in the purchase price and the sale price is usually very small. In addition, arbitrageurs must pay transaction costs to make transactions and it is costly to enter the business (such as costs to educate yourself and start a business). In the long run, arbitrage should have a zero NPV, that is, it should earn a fair return based on the effort and talents of the arbitrageur, and the risk taken.