1-1 A firm's intrinsic value is an estimate of a stock's "true" value based on accurate risk and return data. It can be estimated but not measured precisely. A stock's current price is its market price—the value based on perceived but possibly incorrect information as seen by the marginal investor. From these definitions, you can see that a stock's "true" long-run value is more closely related to its intrinsic value rather than its current price.

1-2 Equilibrium is the situation where the actual market price equals the intrinsic value, so investors are indifferent between buying or selling a stock. If a stock is in equilibrium then there is no fundamental imbalance, hence no pressure for a change in the stock's price. At any given time, most stocks are reasonably close to their intrinsic values and thus are at or close to equilibrium. However, at times stock prices and equilibrium values are different, so stocks can be temporarily undervalued or overvalued.

1-3 If the three intrinsic value estimates for Stock X were different, you would have the most confidence in Company X's CFO's estimate. Intrinsic values are strictly estimates, and different analysts with different data and different views of the future will form different estimates of the intrinsic value for any given stock. However, a firm's managers have the best information about the company's future prospects, so managers' estimates of intrinsic value are generally better than the estimates of outside investors.

1-4 If a stock's market price and intrinsic value are equal, then the stock is in equilibrium and there is no pressure (buying/selling) to change the stock's price. So, theoretically, it is better that the two be equal; however, intrinsic value is a long-run concept. Management's goal should be to maximize the firm's intrinsic value, not its current price. So, maximizing the intrinsic value will maximize the average price over the long run but not necessarily the current price at each point in time. So, stockholders in general would probably expect the firm's market price to be under the intrinsic value—realizing that if management is doing its job that current price at any point in time would not necessarily be maximized. However, the CEO would prefer that the market price be high—since it is the current price that he will receive when exercising his stock options. In addition, he will be retiring after exercising those options, so there will be no repercussions to him (with respect to his job) if the market price drops—unless he did something illegal during his tenure as CEO.

1-5 The board of directors should set CEO compensation dependent on how well the firm performs. The compensation package should be sufficient to attract and retain the CEO but not go beyond what is needed. Compensation should be structured so that the CEO is rewarded on the basis of the stock's performance over the long run, not the stock's price on an option exercise date. This means that options (or direct stock awards) should be phased in over a number of years so the CEO will have an incentive to keep the stock price high over time. If the intrinsic value could be measured in an objective and verifiable manner, then performance pay could be based on changes in intrinsic value. However, it is easier to measure the growth rate in reported profits than the intrinsic value, although reported profits can be manipulated through aggressive accounting procedures and intrinsic value cannot be manipulated. Since intrinsic value is not observable, compensation must be based on the stock's market price—but the price used should be an average over time rather than on a specific date.

1-6 The four forms of business organization are sole proprietorships, partnerships, corporations, and limited liability corporations and partnerships. The advantages of the first two include the ease and low cost of formation. The advantages of corporations include limited liability, indefinite life, ease of ownership transfer, and access to capital markets. Limited liability companies and partnerships have limited liability like corporations.

The disadvantages of a sole proprietorship are (1) difficulty in obtaining large sums of capital; (2) unlimited personal liability for business debts; and (3) limited life. The disadvantages of a partnership are (1) unlimited liability, (2) limited life, (3) difficulty of transferring ownership, and (4) difficulty of raising large amounts of capital. The disadvantages of a corporation are (1) double taxation of earnings and (2) setting up a corporation and filing required state and federal reports, which are complex and time-consuming. Among the disadvantages of limited liability corporations and partnerships are difficulty in raising capital and the complexity of setting them up.

1-7 Stockholder wealth maximization is a long-run goal. Companies, and consequently the stockholders, prosper by management making decisions that will produce long-term earnings increases. Actions that are continually shortsighted often "catch up" with a firm and, as a result, it may find itself unable to compete effectively against its competitors. There has been much criticism in recent years that U.S. firms are too short-run profit-oriented. A prime example is the U.S. auto industry, which has been accused of continuing to build large "gas guzzler" automobiles because they had higher profit margins rather than retooling for smaller, more fuel-efficient models.

1-8 Useful motivational tools that will aid in aligning stockholders' and management's interests include: (1) reasonable compensation packages, (2) direct intervention by shareholders, including firing managers who don't perform well, and (3) the threat of takeover.

The compensation package should be sufficient to attract and retain able managers but not go beyond what is needed. Also, compensation packages should be structured so that managers are rewarded on the basis of the stock's performance over the long run, not the stock's price on an option exercise date. This means that options (or direct stock awards) should be phased in over a number of years so managers will have an incentive to keep the stock price high over time. Since intrinsic value is not observable, compensation must be based on the stock's market price—but the price used should be an average over time rather than on a specific date.

Stockholders can intervene directly with managers. Today, the majority of stock is owned by institutional investors and these institutional money managers have the clout to exercise considerable influence over firms' operations. First, they can talk with managers and make suggestions about how the business should be run. In effect, these institutional investors act as lobbyists for the body of stockholders. Second, any shareholder who has owned $2,000 of a company's stock for one year can sponsor a proposal that must be voted on at the annual stockholders' meeting, even if management opposes the proposal. Although shareholder-sponsored proposals are non-binding, the results of such votes are clearly heard by top management.

If a firm's stock is undervalued, then corporate raiders will see it to be a bargain and will attempt to capture the firm in a hostile takeover. If the raid is successful, the target's executives will almost certainly be fired. This situation gives managers a strong incentive to take actions to maximize their stock's price.

2-2 In a well-functioning economy, capital will flow efficiently from those who supply capital to those who demand it. This transfer of capital can take place in three different ways:

1. Direct transfers of money and securities occur when a business sells its stocks or bonds directly to savers, without going through any type of financial institution. The business delivers its securities to savers, who in turn give the firm the money it needs.
2. Transfers may also go through an investment banking house which underwrites the issue. An underwriter serves as a middleman and facilitates the issuance of securities. The company sells its stocks or bonds to the investment bank, which in turn sells these same securities to savers. The businesses' securities and the savers' money merely "pass through" the investment banking house.
3. Transfers can also be made through a financial intermediary. Here the intermediary obtains funds from savers in exchange for its own securities. The intermediary uses this money to buy and hold businesses' securities. Intermediaries literally create new forms of capital. The existence of intermediaries greatly increases the efficiency of money and capital markets.

2-3 A primary market is the market in which corporations raise capital by issuing new securities. An initial public offering is a stock issue in which privately held firms go public. Therefore, an IPO would be an example of a primary market transaction.

2-4 A money market transaction occurs in the financial market in which funds are borrowed or loaned for short periods (less than one year). A capital market transaction occurs in the financial market in which stocks and intermediate—or long-term debt (one year or longer)—are issued.

a. A U.S. Treasury bill is an example of a money market transaction.

b. Long-term corporate bonds are examples of capital market transactions.

c. Common stocks are examples of capital market transactions.

d. Preferred stocks are examples of capital market transactions.

e. Dealer commercial paper is an example of a money market transaction.

2-7 The physical location exchanges are tangible physical entities. Each of the larger ones occupies its own building, has a limited number of members, and has an elected governing body. A dealer market is defined to include all facilities that are needed to conduct security transactions not made on the physical location exchanges. These facilities include (1) the relatively few dealers who hold inventories of these securities and who are said to "make a market" in these securities; (2) the thousands of brokers who act as agents in bringing the dealers together with investors; and (3) the computers, terminals, and electronic networks that provide a communication link between dealers and brokers.

3-1 From the data given in the problem, we know the following:

Current assets	$ 500,000[b]	Accounts payable and accruals	$ 100,000[d]
Net plant and equipment	2,000,000	Notes payable	150,000
		Current liabilities	$ 250,000[c]
		Long-term debt	750,000
		Total common equity	1,500,000
Total assets	$2,500,000	Total liabilities and equity	$2,500,000[a]

Note: Superscripts correspond to parts below.

a. We are given that the firm's total assets equal $2,500,000. Since both sides of the balance sheet must equal, total liabilities and equity must equal total assets = $2,500,000.

b. Total assets = Current assets + Net plant and equipment
$2,500,000 = Current assets + $2,000,000
Current assets = $2,500,000 – $2,000,000
Current assets = $500,000.

c. Total liabilities and equity = Current liabilities + Long-term debt + Total common equity
$2,500,000 = Current liabilities + $750,000 + $1,500,000
$2,500,000 = Current liabilities + $2,250,000
Current liabilities = $2,500,000 – $2,250,000
Current liabilities = $250,000.

d. Current liabilities = Accounts payable and accruals + Notes payable
$250,000 = Accounts payable and accruals + $150,000
Accounts payable and accruals = $250,000 – $150,000
Accounts payable and accruals = $100,000.

e. Net working capital = Current assets – Current liabilities
Net working capital = $500,000 – $250,000
Net working capital = $250,000.

f. Net operating working capital = Current assets – (Current liabilities – Notes payable)
Net operating working capital = $500,000 – ($250,000 – $150,000)
Net operating working capital = $400,000.

g. NOWC – NWC = $400,000 – $250,000
NOWC – NWC = $150,000.

The difference between the two is equal to the notes payable balance.

3-2 NI = $3,000,000; EBIT = $6,000,000; T = 40%; Interest = ?
Need to set up an income statement and work from the bottom up.

EBIT	$6,000,000
Interest	1,000,000
EBT	$5,000,000
Taxes (40%)	2,000,000
NI	$3,000,000

$$\text{EBT} = \frac{\$3{,}000{,}000}{(1-\text{T})} = \frac{\$3{,}000{,}000}{0.6}$$

Interest = EBIT – EBT = $6,000,000 – $5,000,000 = $1,000,000.

3-3

EBITDA	$7,500,000	(Given)
Depreciation	2,500,000	Deprec. = EBITDA – EBIT = $7,500,000 – $5,000,000
EBIT	$5,000,000	EBIT = EBT + Int = $3,000,000 + $2,000,000
Interest	2,000,000	(Given)
EBT	$3,000,000	
Taxes (40%)	1,200,000	Taxes = EBT × Tax rate
NI	$1,800,000	(Given)

$$\frac{\$1{,}800{,}000}{(1-\text{T})} = \frac{\$1{,}800{,}000}{0.6}$$

3-4 NI = $50,000,000; $R/E_{Y/E}$ = $810,000,000; $R/E_{B/Y}$ = $780,000,000; Dividends = ?

$$R/E_{B/Y} + NI - Div = R/E_{Y/E}$$
$$\$780{,}000{,}000 + \$50{,}000{,}000 - Div = \$810{,}000{,}000$$
$$\$830{,}000{,}000 - Div = \$810{,}000{,}000$$
$$\$20{,}000{,}000 = Div.$$

3-8 Ending R/E= Beg. R/E + Net income – Dividends
$278,900,000 = $212,300,000 + Net income – $22,500,000
$278,900,000 = $189,800,000 + Net income
Net income = $89,100,000.

3-9

Tax rate	35%
WACC	9%
Investor-supplied operating capital	$15,000,000
Sales	$22,500,000
Operating costs (including depreciation)	18,000,000
EBIT	$ 4,500,000

EVA = (EBIT)(1 – T) – (Operating Capital)(WACC)
= $4,500,000(0.65) – ($15,000,000)(0.09)
= $2,925,000 – $1,350,000
= $1,575,000.

4-2 A/E = 2.4; D/A = ?

$$\frac{D}{A} = \left(1 - \frac{1}{A/E}\right)$$
$$\frac{D}{A} = \left(1 - \frac{1}{2.4}\right)$$
$$\frac{D}{A} = 0.5833 = 58.33\%.$$

4-4 TA = \$10,000,000,000; CL = \$1,000,000,000; LT debt = \$3,000,000,000; CE = \$6,000,000,000; Shares outstanding = 800,000,000; P_0 = \$32; M/B = ?

$$\text{Book value} = \frac{\$6,000,000,000}{800,000,000} = \$7.50.$$

$$\text{M/B} = \frac{\$32.00}{\$7.50} = 4.2667.$$

4-6 PM = 2%; EM = 2.0; Sales = \$100,000,000; Assets = \$50,000,000; ROE = ?

ROE = PM × TATO × EM
= NI/S × S/TA × A/E
= 2% × \$100,000,000/\$50,000,000 × 2
= 8%.

4-10 We are given ROA = 3% and Sales/Total assets = 1.5×.

From the DuPont equation:

ROA = Profit margin × Total assets turnover
3% = Profit margin(1.5)
Profit margin = 3%/1.5 = 2%.

We can also calculate the company's debt-to-assets ratio in a similar manner, given the facts of the problem. We are given ROA(NI/A) and ROE(NI/E); if we use the reciprocal of ROE we have the following equation:

$$\frac{E}{A} = \frac{NI}{A} \times \frac{E}{NI} \text{ and } \frac{D}{A} = 1 - \frac{E}{A}, \text{ so}$$
$$\frac{E}{A} = 3\% \times \frac{1}{0.05}$$
$$\frac{E}{A} = 60\%.$$
$$\frac{D}{A} = 1 - 0.60 = 0.40 = 40\%.$$

Alternatively, using the DuPont equation:

ROE = ROA × EM
5% = 3% × EM
EM = 5%/3% = 5/3 = TA/E.

Take reciprocal: E/TA = 3/5 = 60%; therefore, D/A = 1 – 0.60 = 0.40 = 40%.

Thus, the firm's profit margin = 2% and its debt-to-assets ratio = 40%.

4-11 TA = $12,000,000,000; T = 40%; EBIT/TA = 15%; ROA = 5%; TIE = ?

$$\frac{\text{EBIT}}{\$12,000,000,000} = 0.15$$

$$\text{EBIT} = \$1,800,000,000.$$

$$\frac{\text{NI}}{\$12,000,000,000} = 0.05$$

$$\text{NI} = \$600,000,000.$$

Now use the income statement format to determine interest so you can calculate the firm's TIE ratio.

EBIT	$1,800,000,000	See above.
INT	800,000,000	
EBT	$1,000,000,000	EBT = $600,000,000/0.6
Taxes (40%)	400,000,000	
NI	$ 600,000,000	See above.

INT = EBIT – EBT
= $1,800,000,000 – $1,000,000,000

TIE = EBIT/INT
= $1,800,000,000/$800,000,000
= 2.25×.

4-13 ROE = Profit margin × TA turnover × Equity multiplier
= NI/Sales × Sales/TA × TA/Equity.

Now we need to determine the inputs for the DuPont equation from the data that were given. On the left we set up an income statement, and we put numbers in it on the right:

Sales (given)	$10,000,000
– Cost	na
EBIT (given)	$ 1,000,000
– INT (given)	300,000
EBT	$ 700,000
– Taxes (34%)	238,000
NI	$ 462,000

Now we can use some ratios to get some more data:

Total assets turnover = 2 = S/TA; TA = S/2 = $10,000,000/2 = $5,000,000.

D/A = 60%; so E/A = 40%; and, therefore,

Equity multiplier = TA/E = 1/(E/A) = 1/0.4 = 2.5.

Now we can complete the DuPont equation to determine ROE:

ROE = $462,000/$10,000,000 × $10,000,000/$5,000,000 × 2.5 = 0.231 = 23.1%.

5-21 **a.** If Crissie expects a 7% annual return on her investments:

1 payment	10 payments	30 payments
	N = 10	N = 30
	I/YR = 7	I/YR = 7
	PMT = 9500000	PMT = 5500000
	FV = 0	FV = 0
PV = $61,000,000	PV = $66,724,025	PV = $68,249,727

Crissie should accept the 30-year payment option as it carries the highest present value ($68,249,727).

b. If Crissie expects an 8% annual return on her investments:

1 payment	10 payments	30 payments
	N = 10	N = 30
	I/YR = 8	I/YR = 8
	PMT = 9500000	PMT = 5500000
	FV = 0	FV = 0
PV = $61,000,000	PV = $63,745,773	PV = $61,917,808

Crissie should accept the 10-year payment option as it carries the highest present value ($63,745,773).

c. If Crissie expects a 9% annual return on her investments:

1 payment	10 payments	30 payments
	N = 10	N = 30
	I/YR = 9	I/YR = 9
	PMT = 9500000	PMT = 5500000
	FV = 0	FV = 0
PV = $61,000,000	PV = $60,967,748	PV = $56,505,097

Crissie should accept the lump-sum payment option as it carries the highest present value ($61,000,000).

d. The higher the interest rate, the more useful it is to get money rapidly, because it can be invested at those high rates and earn lots more money. So, cash comes fastest with #1, slowest with #3, so the higher the rate, the more the choice is tilted toward #1. You can also think about this another way. The higher the discount rate, the more distant cash flows are penalized, so again, #3 looks worst at high rates, #1 best at high rates.

5-22 **a.** This can be done with a calculator by specifying an interest rate of 5% per period for 20 periods with 1 payment per period.

N = 10 × 2 = 20, I/YR = 10/2 = 5, PV = -10000, FV = 0. Solve for PMT = $802.43.

b. Set up an amortization table:

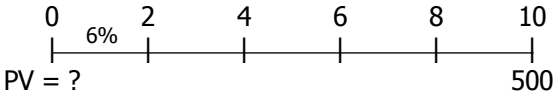
Period	Beginning Balance	Payment	Interest	Payment of Principal	Ending Balance
1	$10,000.00	$802.43	$500.00	$302.43	$9,697.57
2	9,697.57	802.43	484.88	317.55	9,380.02
			$984.88		

Because the mortgage balance declines with each payment, the portion of the payment that is applied to interest declines, while the portion of the payment that is applied to principal increases. The total payment remains constant over the life of the mortgage.

c. Jan must report interest of $984.88 on Schedule B for the first year. Her interest income will decline in each successive year for the reason explained in Part b.

d. Interest is calculated on the beginning balance for each period, as this is the amount the lender has loaned and the borrower has borrowed. As the loan is amortized (paid off), the beginning balance, hence the interest charge, declines and the repayment of principal increases.

5-24 **a.**

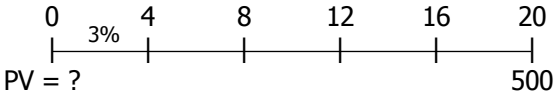


With a financial calculator, enter N = 10, I/YR = 6, PMT = 0, and FV = 500, and then press PV to obtain PV = $279.20.

$$\text{Alternatively, PV} = FV_N\left(\frac{1}{1+I_{NOM}/M}\right)^{NM} = \$500\left(\frac{1}{1+0.12/2}\right)^{5(2)}$$

$$= \$500\left(\frac{1}{1.06}\right)^{10} = \$279.20.$$

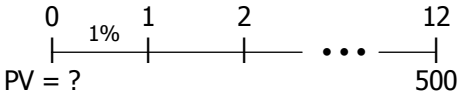
b.



With a financial calculator, enter N = 20, I/YR = 3, PMT = 0, and FV = 500, and then press PV to obtain PV = $276.84.

$$\text{Alternatively, PV} = \$500\left(\frac{1}{1+0.12/4}\right)^{4(5)} = \$500\left(\frac{1}{1.03}\right)^{20} = \$276.84.$$

c.

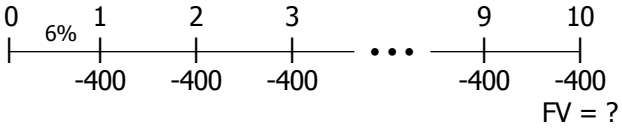


With a financial calculator, enter N = 12, I/YR = 1, PMT = 0, and FV = 500, and then press PV to obtain PV = $443.72.

$$\text{Alternatively, PV} = \$500\left(\frac{1}{1+0.12/12}\right)^{12(1)} = \$500\left(\frac{1}{1.01}\right)^{12} = \$443.72.$$

d. The PVs for Parts a and b decline as periods/year increases. This occurs because, with more frequent compounding, a smaller initial amount (PV) is required to get to $500 after 5 years. For Part c, even though there are 12 periods/year, compounding occurs over only 1 year, so the PV is larger.

5-25 **a.**

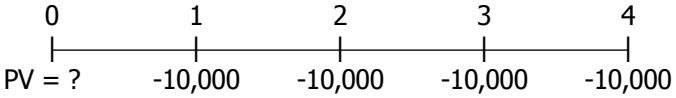


Enter N = 5 × 2 = 10, I/YR = 12/2 = 6, PV = 0, PMT = -400, and then press FV to get FV = $5,272.32.

b. Now the number of periods is calculated as N = 5 × 4 = 20, I/YR = 12/4 = 3, PV = 0, and PMT = -200. The calculator solution is $5,374.07. The solution assumes that the nominal interest rate is compounded at the annuity period.

c. The annuity in Part b earns more because the money is on deposit for a longer period of time and thus earns more interest. Also, because compounding is more frequent, more interest is earned on interest.

5-31 **a.**

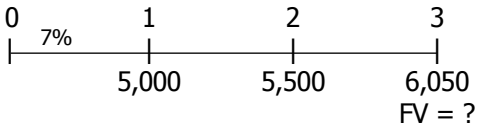


With a calculator, enter N = 4, I/YR = 5, PMT = -10000, and FV = 0. Then press PV to get PV = $35,459.51.

b. At this point, we have a 3-year, 5% annuity whose value is $27,232.48. You can also think of the problem as follows:

$35,459.51(1.05) – $10,000 = $27,232.49.

5-33 Begin with a time line:



Use a financial calculator to calculate the present value of the cash flows and then determine the future value of this present value amount:

Step 1: $CF_0 = 0$, $CF_1 = 5000$, $CF_2 = 5500$, $CF_3 = 6050$, I/YR = 7. Solve for NPV = $14,415.41.

Step 2: Input the following data: N = 3, I/YR = 7, PV = -14415.41, PMT = 0, and solve for FV = $17,659.50.