smaller fixed asset requirement, the projected AFN would decline from an estimated $118 million to $118 − $88 = $30 million.

Note also that when excess capacity exists, sales can grow to the capacity sales as calculated above with no increase in fixed assets, but sales beyond that level would require additions of fixed assets as in our example. The same situation could occur with respect to inventories, and the required additions would be determined in exactly the same manner as for fixed assets. Theoretically, the same situation could occur with other types of assets, but as a practical matter excess capacity normally exists only with respect to fixed assets and inventories.

SELF-TEST

How do economies of scale and lumpy assets affect financial forecasting?

SUMMARY

- The **forecasted financial statements (FFS) method** of financial planning forecasts the entire set of financial statements. It usually begins with a forecast of the firm's sales and then projects many items on the financial statements as a percent of sales.
- The **additional funds needed (AFN) equation** can be used to forecast additional external financing requirements, but only for one year ahead and only if all asset-to-sales ratios are identical, all spontaneous liabilities-to-sales ratios are identical, and all cost-to-sales ratios are identical.
- A firm can determine its AFN by estimating the amount of new assets necessary to support the forecasted level of sales and then subtracting from this amount the spontaneous funds that will be generated from operations.
- The higher a firm's **sales growth rate** and the higher its **payout ratio**, the greater will be its need for additional financing.
- There are two major applications of forecasted financial statements. First, the forecasted free cash flows can be used to estimate the impact that changes in operating plans have on the firm's estimated intrinsic value of operations and stock price. Second, the forecasted financing surplus or deficit allows the firm to identify its future financing needs.
- Adjustments must be made if economies of scale exist in the use of assets, if excess capacity exists, or if growth must occur in large increments (**lumpy assets**).
- **Excess capacity adjustments** can be used to forecast asset requirements in situations in which assets are not expected to grow at the same rate as sales.

QUESTIONS

(12-1) Define each of the following terms:

a. Operating plan; financial plan
b. Spontaneous liabilities; profit margin; payout ratio
c. Additional funds needed (AFN); AFN equation; capital intensity ratio; self-supporting growth rate
d. Forecasted financial statement approach using percent of sales
e. Excess capacity; lumpy assets; economies of scale
f. Full capacity sales; target fixed assets/sales ratio; required level of fixed assets

Question 12-1 →

(12-2) Some liability and net worth items increase spontaneously with increases in sales. Put a check (✓) by those items listed below that typically increase spontaneously:

Accounts payable	_____	Mortgage bonds	_____
Notes payable to banks	_____	Common stock	_____
Accrued wages	_____	Retained earnings	_____
Accrued taxes	_____		

(12-3) The following equation is sometimes used to forecast financial requirements:

$$AFN = (A_0^*/S_0)(\Delta S) - (L_0^*/S_0)(\Delta S) - MS_1(1 - POR)$$

What key assumption do we make when using this equation? Under what conditions might this assumption not hold true?

Question 12-4

(12-4) Name five key factors that affect a firm's external financing requirements.

(12-5) What is meant by the term "self-supporting growth rate"? How is this rate related to the AFN equation, and how can that equation be used to calculate the self-supporting growth rate?

(12-6) Suppose a firm makes the policy changes listed below. If a change means that external, nonspontaneous financial requirements (AFN) will increase, indicate this by a (+); indicate a decrease by a (−); and indicate no effect or an indeterminate effect by a (0). Think in terms of the *immediate* effect on funds requirements.

a. The dividend payout ratio is increased. _____
b. The firm decides to pay all suppliers on delivery, rather than after a 30-day delay, to take advantage of discounts for rapid payment. _____
c. The firm begins to offer credit to its customers, whereas previously all sales had been on a cash basis. _____
d. The firm's profit margin is eroded by increased competition, although sales hold steady. _____
e. The firm sells its manufacturing plants for cash to a contractor and simultaneously signs an outsourcing contract to purchase from that contractor goods that the firm formerly produced. _____
f. The firm negotiates a new contract with its union that lowers its labor costs without affecting its output. _____

SELF-TEST PROBLEMS Solutions Appear in Appendix A

(ST-1) Self-Supporting Growth Rate

The Barnsdale Corporation has the following ratios: $A_0^*/S_0 = 1.6$; $L_0^*/S_0 = 0.4$; profit margin = 0.10; and dividend payout ratio = 0.45, or 45%. Sales last year were $100 million. Assuming that these ratios will remain constant, use the AFN equation to determine the firm's self-supporting growth rate—in other words, the maximum growth rate Barnsdale can achieve without having to employ nonspontaneous external funds.

(ST-2) AFN Equation

Refer to Problem ST-1, and suppose Barnsdale's financial consultants report (1) that the inventory turnover ratio (sales/inventory) is 3, compared with an industry average of 4, and (2) that Barnsdale could reduce inventories and thus raise its turnover ratio to 4

PROBLEMS Answers Appear in Appendix B

Easy Problems 1–3 * Discussion * Week 3 Refer to notes

(12-1) AFN Equation Broussard Skateboard's sales are expected to increase by 15% from $8 million in 2013 to $9.2 million in 2014. Its assets totaled $5 million at the end of 2013. Broussard is already at full capacity, so its assets must grow at the same rate as projected sales. At the end of 2013, current liabilities were $1.4 million, consisting of $450,000 of accounts payable, $500,000 of notes payable, and $450,000 of accruals. The after-tax profit margin is forecasted to be 6%, and the forecasted payout ratio is 40%. Use the AFN equation to forecast Broussard's additional funds needed for the coming year.

(12-2) AFN Equation Refer to Problem 12-1. What would be the additional funds needed if the company's year-end 2013 assets had been $7 million? Assume that all other numbers, including sales, are the same as in Problem 12-1 and that the company is operating at full capacity. Why is this AFN different from the one you found in Problem 12-1? Is the company's "capital intensity" ratio the same or different?

(12-3) AFN Equation Refer to Problem 12-1. Return to the assumption that the company had $5 million in assets at the end of 2013, but now assume that the company pays no dividends. Under these assumptions, what would be the additional funds needed for the coming year? Why is this AFN different from the one you found in Problem 12-1?

Intermediate Problems 4–6 Problem 12-4

(12-4) Sales Increase Maggie's Muffins, Inc., generated $5,000,000 in sales during 2013, and its year-end total assets were $2,500,000. Also, at year-end 2013, current liabilities were $1,000,000, consisting of $300,000 of notes payable, $500,000 of accounts payable, and $200,000 of accruals. Looking ahead to 2014, the company estimates that its assets must increase at the same rate as sales, its spontaneous liabilities will increase at the same rate as sales, its profit margin will be 7%, and its payout ratio will be 80%. How large a sales increase can the company achieve without having to raise funds externally—that is, what is its self-supporting growth rate?

(12-5) Long-Term Financing Needed At year-end 2013, Wallace Landscaping's total assets were $2.17 million and its accounts payable were $560,000. Sales, which in 2013 were $3.5 million, are expected to increase by 35% in 2014. Total assets and accounts payable are proportional to sales, and that relationship will be maintained. Wallace typically uses no current liabilities other than accounts payable. Common stock amounted to $625,000 in 2013, and retained earnings were $395,000. Wallace has arranged to sell $195,000 of new common stock in 2014 to meet some of its financing needs. The remainder of its financing needs will be met by issuing new long-term debt at the end of 2014. (Because the debt is added at the end of the year, there will be no additional interest expense due to the new debt.) Its net profit margin on sales is 5%, and 45% of earnings will be paid out as dividends.

a. What were Wallace's total long-term debt and total liabilities in 2013?
b. How much new long-term debt financing will be needed in 2014? (*Hint:* AFN – New stock = New long-term debt.)

Problem 12-6

(12-6) Additional Funds Needed

The Booth Company's sales are forecasted to double from $1,000 in 2013 to $2,000 in 2014. Here is the December 31, 2013, balance sheet:

Cash	$ 100	Accounts payable	$ 50
Accounts receivable	200	Notes payable	150
Inventories	200	Accruals	50
Net fixed assets	500	Long-term debt	400
		Common stock	100
		Retained earnings	250
Total assets	$1,000	Total liabilities and equity	$1,000

Booth's fixed assets were used to only 50% of capacity during 2013, but its current assets were at their proper levels in relation to sales. All assets except fixed assets must increase at the same rate as sales, and fixed assets would also have to increase at the same rate if the current excess capacity did not exist. Booth's after-tax profit margin is forecasted to be 5% and its payout ratio to be 60%. What is Booth's additional funds needed (AFN) for the coming year?

Challenging Problems 7–9

(12-7) Forecasted Statements and Ratios

Upton Computers makes bulk purchases of small computers, stocks them in conveniently located warehouses, ships them to its chain of retail stores, and has a staff to advise customers and help them set up their new computers. Upton's balance sheet as of December 31, 2013, is shown here (millions of dollars):

Cash	$ 3.5	Accounts payable	$ 9.0
Receivables	26.0	Notes payable	18.0
Inventories	58.0	Line of credit	0
Total current assets	$ 87.5	Accruals	8.5
Net fixed assets	35.0	Total current liabilities	$ 35.5
		Mortgage loan	6.0
		Common stock	15.0
		Retained earnings	66.0
Total assets	$122.5	Total liabilities and equity	$122.5

Sales for 2013 were $350 million and net income for the year was $10.5 million, so the firm's profit margin was 3.0%. Upton paid dividends of $4.2 million to common stockholders, so its payout ratio was 40%. Its tax rate was 40%, and it operated at full capacity. Assume that all assets/sales ratios, spontaneous liabilities/sales ratios, the profit margin, and the payout ratio remain constant in 2014.

a. If sales are projected to increase by $70 million, or 20%, during 2014, use the AFN equation to determine Upton's projected external capital requirements.
b. Using the AFN equation, determine Upton's self-supporting growth rate. That is, what is the maximum growth rate the firm can achieve without having to employ nonspontaneous external funds?
c. Use the forecasted financial statement method to forecast Upton's balance sheet for December 31, 2014. Assume that all additional external capital is raised as a line of credit at the end of the year and is reflected (because the debt is added at the end of the year, there will be no additional interest expense due to the new debt).