CHAPTER NINE

9

PROSPECTIVE ANALYSIS

A LOOK BACK <

The preceding chapter dealt with analysis of company returns—both profitability and return on invested capital. Emphasis was on rate of return measures, disaggregation of returns, and accounting analysis of income components. That return-based chapter complements later chapters that focus on risk, including liquidity and solvency.

A LOOK AT THIS CHAPTER •

We study forecasting and pro forma analysis of financial statements in this chapter. We provide a detailed example of the forecasting process to project the income statement, the balance sheet, and the statement of cash flows. We describe the relevance of forecasting for security valuation and provide an example using forecasted financial statements to implement a valuation model. We discuss the concept of value drivers and their reversion to long-run equilibrium levels.

A LOOK AHEAD >

Chapter 10 expands our analysis of a company to short-term liquidity, capital structure, and long-term solvency. We explain liquidity and describe analysis tools such as accounting-based ratios, turnover, and operating activity measures of liquidity. We also analyze capital structure and interpret its implications for company performance and solvency.

LEARNING OBJECTIVES

- Describe the importance of prospective analysis.
- Explain the process of projecting the income statement, the balance sheet, and the statement of cash flows.
- Discuss and illustrate the importance of sensitivity analysis.
- Describe the implementation of the projection process for valuation of equity securities.
- Discuss the concept of value drivers and their reversion to long-run equilibrium levels.

Fundamental Analysis Is Back

NEW YORK–For years, two great armies of investors have done battle on Wall Street. In one camp stand growth investors, willing to pay dearly for companies they believe can generate big profits for years to come. In the other camp are value investors. They'll buy only into companies with real assets and solid earnings in the here and now–and at bargain prices. As yet, value investing is more a framework than a set of codified rules. It relies more on forecasting, even though Benjamin Graham and David Dodd, who laid the principles of value investing, frowned on forecasts.

BusinessWeek (2004) reports that "When you look at the Russell 1000 Value and Russell 1000 Growth indexes, which are now 25 years old, value beats growth by three percentage points a year, on average. Economists . . . using their own indexes, show value beating growth by an average 2.6% a year over 75 years." Whether you use growth or value criteria, it's more important to pay attention to the fundamentals of a company's business than it is to set investment criteria based solely on ratios like price-to-earnings or PE to sales growth.

Value investors' descriptions of their investing styles are also varied. But if you listen closely, the bottom line is the same–assessment of fundamentals. In the broadest terms, value investors are looking for companies that trade at less than their real value in the hope that the value is eventually recognized by other market players and reflected in higher stock prices.

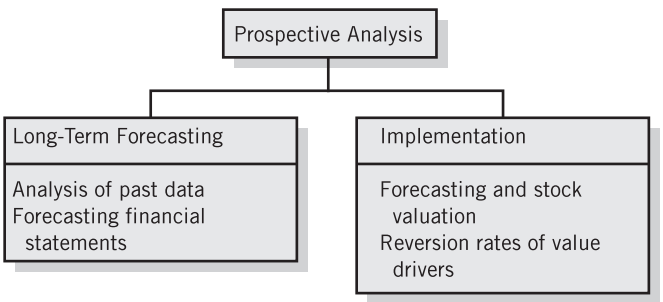
. . . pay attention to the fundamentals of a company's business . . .

To identify such latent value, investors need to examine companies' fundamental business prospects. "You want a company where something is going to change, either externally, like a fundamental change in its industry, or internally, like a change in management," says the portfolio manager of the Oppenheimer Value Fund.

Prospective analysis is a central component of value investing. It relies on a sound understanding of the company's fundamentals and its economic environment. From this base, forecasts of future performance are developed that provide the basis for valuation of stock price. Whichever investing philosophy we subscribe to, the message is clear: understand where the company's business model and strategic plan are taking it.

PREVIEW OF CHAPTER 9

Prospective analysis is the final step in the financial statement analysis process. It can be undertaken only after the historical financial statements have been properly adjusted to accurately reflect the economic performance of the company. As discussed in previous chapters, these adjustments may include, for example, eliminating transitory items in the income statement or reallocating them to past or future years, capitalizing (expensing) items that have been expensed (capitalized) by management, capitalizing operating leases, equity method investments, and other forms of off-balance sheet financing, and so forth. Prospective analysis includes forecasting of the balance sheet, income statement and statement of cash flows.



Prospective analysis is central to security valuation. Both the free cash flow and residual income valuation models described in Chapter 1 require estimates of future financial statements. The residual income model, for example, requires projections of future net profits and book values of equity in order to estimate current stock price. Prospective analysis is also useful to examine the viability of companies' strategic plans. For this, we analyze whether a company will be able to generate sufficient cash flows from operations to finance expected growth or whether it will be required to seek debt or equity financing in the future. We are also interested in analyzing whether current strategic plans will yield the benefits forecasted by company management. And finally, prospective analysis is useful to creditors to assess a company's ability to meet its debt service requirements.

Our discussion of projection mechanics centers on forecasts of the financial statements for Target Corporation. We provide a detailed explanation of the forecasting process in the next section.

THE PROJECTION PROCESS

We begin our discussion with a comprehensive example of the projection process using the financial statements of Target Corporation.

Projecting Financial Statements

The projection process begins with the income statement, followed by the balance sheet and the statement of cash flows.

Projected Income Statement

The income statements of Target as of 2003–2005 are provided in Exhibit 9.1 together with selected ratios. The projection process begins with an expected growth in sales. In this example we use historical trends to predict future levels. A more detailed analysis would incorporate outside information such as the following:

- **Expected level of macroeconomic activity.** Since Target customers' purchases are influenced by the level of personal disposable income, our analysis might incorporate estimates relating to the overall growth in the economy and the expected growth of retail sales in particular. For example, if the economy is in a cyclical upturn, we might be comfortable in projecting an increase in sales greater than that of the recent past.
- **The competitive landscape.** Has the number of competitors increased? Or, have weaker rivals ceased operations? Changes in the competitive landscape will influence our projections of unit sales as well as Target's ability to raise prices. Both of these will impact top line growth.
- **New versus old store mix.** New stores typically enjoy significantly greater sales increases than older stores since they may tap poorly served markets or provide a more up-to-date product mix than existing competitors. Older stores, by comparison, typically grow at the overall rate of growth in the local economy. Our analysis must consider, therefore, expansion plans announced by management.

We begin with an assumption that sales will grow at 11.455% in 2006, the same growth rate as in 2005. Once the projection has been completed, sensitivity analysis will examine the implications of higher and lower growth rates on our forecasts.

Target Corporation Income Statements — **Exhibit 9.1**

(in millions)	2005	2004	2003
Sales	$46,839	$42,025	$37,410
Cost of goods sold	31,445	28,389	25,498
Gross profit	15,394	13,636	11,912
Selling, general and administrative expense	10,534	9,379	8,134
Depreciation and amortization expense	1,259	1,098	967
Interest expense	570	556	584
Income before tax	3,031	2,603	2,227
Income tax expense	1,146	984	851
Income (loss) from extraordinary items and discontinued operations	1,313	190	247
Net income	$ 3,198	$ 1,809	$ 1,623
Outstanding shares	891	912	910
Selected Ratios (in percent)			
Sales growth	11.455%	12.336%	
Gross profit margin	32.866	32.447	
Selling, general and administrative expense/Sales	22.490	22.318	
Depreciation expense/Gross prior-year PP&E	6.333	5.245	
Interest expense/Prior-year long-term debt	5.173	4.982	
Income tax expense/Pretax income	37.809	37.803	

Target's gross profit margin has increased slightly to 32.866% of sales. For our purposes, we assume 32.866%, the most recent gross profit margin. In practice, our estimate of gross profit margin will be influenced, in part, by the strength of the economy and the level of competition in Target's markets. For example, in an increasingly competitive environment we might question the company's ability to increase gross profit margin as selling prices will be difficult to increase. Selling, general, and administrative (SG&A) expenses have also remained constant at about 22% of sales. Our projection of SG&A expense is 22.49% of sales, the most recent experience. In practice, we might examine individual expense items and estimate each individually, incorporating knowledge we have gained from the MD&A section of the financial statements or from outside sources. For a retailing company like Target, trends in wage and occupancy costs and advertising expenses require greater scrutiny.

Depreciation expense is a significant line item and should be projected separately. It is a fixed expense and is a function of the amount of depreciable assets. In recent years, Target has reported depreciation expense of approximately 6% of the balance of beginning-of-year gross property, plant, and equipment. Our projection assumes 6.333% of the 2005 property, plant, and equipment (PP&E) balance, the most recent experience.

Similarly, we compute the historical ratio of interest expense relative to beginning-of-year interest-bearing debt. This ratio has recently increased slightly over the past two years from 4.982% to 5.173%. Our projection assumes 5.173% of the beginning-of-year balance of interest-bearing debt. In practice, our estimates will incorporate projections of future levels of long-term interest rates. Finally, tax expense as a percentage of pretax income has been constant at the most recent level of 37.809%, used in our projection.

Exhibit 9.2 **Target Corporation Projected Income Statement**

(in millions)	Forecasting Step	2006 Estimate
Income statement		
Total revenues	1	$52,204
Cost of goods sold	3	35,047
Gross profit	2	17,157
Selling, general, and administrative expense	4	11,741
Depreciation and amortization expense	5	1,410
Interest expense	6	493
Income before tax	7	3,513
Income tax expense	8	1,328
Income (loss) from extraordinary items and discontinued operations	9	0
Net income	10	$ 2,185
Outstanding shares		891
Forecasting Assumptions (in percent)		
Sales growth		11.455%
Gross profit margin		32.866
Selling, general, and administrative expense/Sales		22.490
Depreciation expense/Gross prior-year PP&E		6.333
Interest expense/Prior-year long-term debt		5.173
Income tax expense/Pretax income		37.809

Given these assumptions, Target's projected income statement for 2006 is presented in Exhibit 9.2. The following are the steps in the projection of this statement:

1. Sales: $52,204 = $46,839 × 1.11455
2. Gross profit: $17,157 = $52,204 × 32.866%
3. Cost of goods sold: $35,047 = $52,204 − $17,157
4. Selling, general, and administrative: $11,741 = $52,204 × 22.49%
5. Depreciation and amortization: $1,410 = $22,272 (beginning-period PP&E gross) × 6.333%
6. Interest: $493 = $9,538 (beginning-period interest-bearing debt) × 5.173%
7. Income before tax: $3,513 = $17,157 − $11,741 − $1,410 − $493
8. Tax expense: $1,328 = $3,513 × 37.809%
9. Extraordinary and discontinued items: none
10. Net income: $2,185 = $3,513 − $1,328

Projected Balance Sheet

The balance sheets of Target for 2003–2005 are provided in Exhibit 9.3 together with selected ratios. The forecast of the 2006 balance sheet involves the following steps:

1. Project current assets other than cash, using projected sales or cost of goods sold and appropriate turnover ratios as described below.
2. Project PP&E increases with capital expenditures estimate derived from historical trends or information obtained in the MD&A section of the annual report.

Target Corporation Balance Sheets ***Exhibit 9.3***

(in millions)	2005	2004	2003
Cash	$ 2,245	$ 708	$ 758
Receivables	5,069	4,621	5,565
Inventories	5,384	4,531	4,760
Other current assets	1,224	3,092	852
Total current assets	13,922	12,952	11,935
Property, plant, and equipment (PP&E)	22,272	19,880	20,936
Accumulated depreciation	5,412	4,727	5,629
Net property, plant, and equipment	16,860	15,153	15,307
Other assets	1,511	3,311	1,361
Total assets	$32,293	$31,416	$28,603
Accounts payable	$ 5,779	$ 4,956	$ 4,684
Current portion of long-term debt	504	863	975
Accrued expenses	1,633	1,288	1,545
Income taxes & other	304	1,207	319
Total current liabilities	8,220	8,314	7,523
Deferred income taxes and other liabilities	2,010	1,815	1,451
Long-term debt	9,034	10,155	10,186
Total liabilities	19,264	20,284	19,160
Common stock	74	76	76
Additional paid-in capital	1,810	1,530	1,256
Retained earnings	11,145	9,526	8,111
Shareholders' equity	13,029	11,132	9,443
Total liabilities and net worth	$32,293	$31,416	$28,603
Selected Ratios			
Accounts receivable turnover rate	9.240	9.094	6.722
Inventory turnover rate	5.840	6.266	5.357
Accounts payable turnover rate	5.441	5.728	5.444
Accrued expenses turnover rate	28.683	32.628	24.214
Taxes payable/Tax expense	26.527%	122.663%	37.485%
Dividends per share	$ 0.310	$ 0.260	$ 0.240
Capital expenditures (CAPEX)—in millions	3,012	2,671	3,189
CAPEX/Sales	6.431%	6.356%	8.524%

3. Project current liabilities other than debt, using projected sales or cost of goods sold and appropriate turnover ratios as described below.
4. Obtain current maturities of long-term debt from the long-term debt footnote.
5. Assume other short-term indebtedness is unchanged from prior year balance unless they have exhibited noticeable trends.
6. Assume initial long-term debt balance is equal to the prior period long-term debt less current maturities from (4) above.

7. Assume other long-term obligations are equal to the prior year's balance unless they have exhibited noticeable trends.
8. Assume initial estimate of common stock is equal to the prior year's balance.
9. Assume retained earnings are equal to the prior year's balance plus (minus) net profit (loss) and less expected dividends.
10. Assume other equity accounts are equal to the prior year's balance unless they have exhibited noticeable trends.

The sum of steps (3)−(10) yields total liabilities and equity. Total assets are, then, set equal to this amount and the resulting cash figure is computed as total assets less (1) and (2). At this point, cash will either be too high or too low. Long-term debt and common stock are then adjusted for issuances (repurchases) as appropriate to yield the desired level of cash and to maintain historical financial leverage. These adjustments indicate the degree of financing required to support the company's growth.

To begin, the projection of receivables, inventories, PP&E, accounts payable, and accrued expenses uses sales and cost of goods sold projections together with turnover rates for these accounts. For example, the receivables turnover rate based on ending accounts receivable is:

$$\text{Accounts receivable turnover rate} = \frac{\text{Sales}}{\text{Accounts receivable balance}}$$

Next, the projected accounts receivables can be computed as:

$$\text{Projected accounts receivable} = \frac{\text{Projected sales}}{\text{Accounts receivable turnover rate}}$$

Our projection of accounts receivables assumes the most recent turnover rate of 9.24.

Similarly, we use the most recent inventory turnover rate (based on ending inventories) of 5.84 together with cost of goods sold to project inventories. A more refined level of analysis might examine Target's ability to sell off accounts receivable to special purpose entities. And for inventories, we might examine inventory turnover rates for seasoned versus new stores and the anticipated growth of new stores. Existing inventories might be projected to grow with the level of anticipated sales growth. Additional inventories required for new stores would be added to this amount.

Property, plant, and equipment is estimated as the prior year's gross PP&E balance plus historical capital expenditures as a percentage of sales. Historical capital expenditures are obtained from the statement of cash flows. Over the past three years, capital expenditures as a percentage of sales have remained steady at about 6.4% of sales. We use 6.43% to estimate capital expenditures for 2006. Once the projection is complete, this percentage can be subsequently adjusted to examine the financial implications of higher (lower) levels of capital expenditures.

Accounts payable estimates are based on historical payable turns and cost of goods sold. We use the most recent turnover ratio (based on ending accounts payable) of 5.441 to estimate 2006 payables. Similarly, accrued expenses as a percentage of sales are estimated with the most recent accrual turnover rate of 28.683. Finally, taxes payable are estimated based on the historical relation of payables to tax expense, and we use the most recent level of 26.527% to project 2006 taxes payable.

A schedule of current maturities of long-term debt is provided in the footnotes. We use the amount for 2006 referenced in the schedule. Long-term debt, then, is initially estimated as the previous balance of long-term debt less our estimate of its current maturities. This level of debt will be adjusted to achieve the desired balance of cash and financial leverage once the initial balance sheet is constructed. Likewise, common and treasury stock are assumed to be equal to the prior year's balances.

Target Corporation Projected Balance Sheet ***Exhibit 9.4***

(in millions)	Forecasting Step	2006 Estimate	2005
Cash	17	$ 1,402	$ 2,245
Receivables	1	5,650	5,069
Inventories	2	6,001	5,384
Other current assets	3	1,224	1,224
Total current assets		14,277	13,922
Property, plant, and equipment	4	25,629	22,272
Accumulated depreciation	5	6,822	5,412
Net property, plant, and equipment	6	18,807	16,860
Other assets	7	1,511	1,511
Total assets		$34,595	$32,293
Accounts payable	8	$ 6,441	$ 5,779
Current portion of long-term debt	9	751	504
Accrued expenses	10	1,820	1,633
Income taxes & other	11	352	304
Total current liabilities		9,364	8,220
Deferred income taxes and other liabilities	12	2,010	2,010
Long-term debt	13	8,283	9,034
Total liabilities		19,657	19,264
Common stock	14	74	74
Additional paid-in capital	15	1,810	1,810
Retained earnings	16	13,054	11,145
Shareholders' equity		14,938	13,029
Total liabilities and net worth		$34,595	$32,293
Selected Ratios			
Accounts receivable turnover rate		9.240	9.240
Inventory turnover rate		5.840	5.840
Accounts payable turnover rate		5.441	5.441
Accrued expenses turnover rate		28.683	28.683
Taxes payable/Tax expense		26.527%	26.527%
Dividends per share		$ 0.310	$ 0.310
Capital expenditures (CAPEX)—in millions		3,357	3,012
CAPEX/Sales		6.431%	6.431%

Given these assumptions, Target's projected balance sheet for 2006 is presented in Exhibit 9.4. The following are the steps in the projection of this statement (data sources in parentheses):

1. Receivables: $5,650 = $52,204 (Sales)/9.24 (Receivable turnover).
2. Inventories: $6,001 = $35,047 (Cost of goods sold)/5.84 (Inventory turnover).
3. Other current assets: no change.
4. PP&E: $25,629 = $22,272 (Prior year's balance) + $3,357 (Capital expenditure estimate: estimated sales of $52,204 × 6.431% CAPEX/sales percentage).

5. Accumulated depreciation: $6,822 = $5,412 (Prior balance) + $1,410 (Depreciation estimate).
6. Net PP&E: $18,807 = $25,629 − $6,822.
7. Other long-term assets: no change.
8. Accounts payable: $6,441 = $35,047 (Cost of goods sold)/5.441 (Payable turnover).
9. Current portion of long-term debt: amount reported in long-term debt footnote as the current maturity for 2006.
10. Accrued expenses: $1,820 = $52,204 (Sales)/28.683 (Accrued expense turnover).
11. Taxes payable: $352 = $1,328 (Tax expense) × 26.527% (Tax payable/Tax expense).
12. Deferred income taxes and other liabilities: no change.
13. Long-term debt: $8,283 = $9,034 (Prior year's long-term debt) − $751 (Scheduled current maturities from step 9).
14. Common stock: no change.
15. Additional paid-in capital: no change.
16. Retained earnings: $13,054 = $11,145 (Prior year's retained earnings) + $2,185 (Projected net income) − $276 (Estimated dividends of $0.31 per share × 891 million shares).
17. Cash: amount needed to balance total liabilities and equity less steps (1)–(7).

The initial balance sheet estimate yields a cash balance of $1,402 million. This represents 4.1% of projected total assets. Although lower than the 2005 level of 7% of total assets, this cash balance is in line with prior percentages in the 2–3% range. If the estimated cash balance is much higher or lower, further adjustments can be made to (1) invest excess cash in marketable securities (projected income will need to be adjusted for the additional nonoperating investment income), or (2) reduce long-term debt and/or equity proportionately so as to keep the degree of financial leverage consistent with prior years. If the level of cash is too low, additional long-term debt and/or common stock can be increased as required, keeping the level of financial leverage constant. Our projection indicates that Target will be able to fund its growth with available funds and internally generated cash.

Projected Statement of Cash Flows

The projected statement of cash flows is computed from the projected income statement and projected balance sheet as discussed in Chapter 7. It is presented in Exhibit 9.5. The projected net cash flows from operations of $3,295 million partially finance the capital expenditures of $3,357 million, reductions of long-term debt in the amount of $504 million, and dividends of $276 million. The remaining deficit results in an $843 million reduction in cash.

Sensitivity Analysis

The projected financial statements are primarily based on expected relations between income statement and balance sheet accounts. In this example, we used the most recent ratios as Target's operations are fairly stable and we are assuming no significant changes in operating strategy.

It is often useful, however, to vary these assumptions in order to analyze their impact on financing requirements, return on assets and equity, and so on. For example, if we assume increases in capital expenditures to 7.5% of sales, capital expenditures will rise to $3.9 billion, and the cash balance will decline to $845 million, 2.4% of total assets and

Target Corporation Projected Statement of Cash Flows ***Exhibit 9.5***

(in millions)	2006 Estimate
Net income	$2,185
Items to adjust income to cash flows	
Depreciation and amortization	1,410
Receivables	(581)
Inventories	(617)
Accounts payable	662
Accrued expenses	187
Income taxes and other	48
Net cash flow from operations	3,294
Capital expenditures	(3,357)
Net cash flow from investing activities	(3,357)
Long-term debt	(504)
Dividends	(276)
Net cash flow from financing activities	(780)
Net change in cash	$ (843)
Beginning cash	2,245
Ending cash	$1,402

below the level of prior years. In that case, external financing in the form of debt and/or equity will be required. Similar increases in financing requirements would also result from a decrease in receivable or inventory turns. Analysts often prepare several projections to examine best (worst) case scenarios in addition to the most likely case. This sensitivity analysis highlights which assumptions have the greatest impact on financial results and, consequently, help to identify those areas requiring greater scrutiny.

Application of Prospective Analysis in the Residual Income Valuation Model

As we stated at the outset of this chapter, prospective analysis is central to security analysis. The residual income valuation model, for example, defines equity value at time t as the sum of current book value and the present value of all future expected residual income:

$$V_t = BV_t + \frac{E(RI_{t+1})}{(1+k)^1} + \frac{E(RI_{t+2})}{(1+k)^2} + \frac{E(RI_{t+3})}{(1+k)^3} + \cdots$$

where BV_t is book value at the end of period t, RI_{t+n} is residual income in period $t+n$, and k is cost of capital (see Chapter 1). **Residual income** at time t is defined as comprehensive net income minus a charge on beginning book value, that is, $RI_t = NI_t - (k \times BV_{t-1})$.

Exhibit 9.6 ***Valuation of Syminex Common Stock***

	HISTORICAL FIGURES		FORECAST HORIZON					TERMINAL YEAR
	2004	2005	2006	2007	2008	2009	2010	2011
Sales growth	8.50%	8.6957%	*8.90%*	*9.10%*	*8.00%*	*7.00%*	*6.00%*	*3.50%*
Net profit margin (Net income/Sales)	9.05%	9.1554%	*9.20%*	*9.40%*	*9.40%*	*9.40%*	*9.40%*	*9.40%*
Net working capital turnover (Sales/Avg. NWC)	22.7353	11.8271	*11.8271*	*11.8271*	*11.8271*	*11.8271*	*11.8271*	*11.8271*
Fixed assets turnover (Sales/Avg. fixed assets)	1.8341	1.9878	*1.9878*	*1.9878*	*1.9878*	*1.9878*	*1.9878*	*1.9878*
Total operating assets/Total equity	2.3362	2.5186	*2.5186*	*2.5186*	*2.5186*	*2.5186*	*2.5186*	*2.5186*
Cost of equity			*12.5%*					
($ thousands)								
Sales	$81,324	$88,396	$96,263	$105,023	$113,425	$121,365	$128,647	$133,149
Net income	7,360	8,093	8,856	9,872	10,662	11,408	12,093	12,516
Net working capital	3,577	7,474	8,139	8,880	9,590	10,262	10,877	11,258
Fixed assets	44,340	44,469	48,427	52,834	57,060	61,054	64,718	66,983
Total operating assets	47,917	51,943	56,566	61,713	66,651	71,316	75,595	78,241
Long-term liabilities	27,406	31,319	34,106	37,210	40,187	43,000	45,580	47,175
Total stockholders' equity	20,511	20,624	22,460	24,503	26,464	28,316	30,015	31,066
Residual Income Computation								
Net income			$ 8,856	$ 9,872	$ 10,662	$ 11,408	$ 12,093	$ 12,516
Beginning equity			$20,624	$ 22,460	$ 24,503	$ 26,464	$ 28,316	$ 30,015
Required equity return			12.5%	12.5%	12.5%	12.5%	12.5%	12.5%
Expected income			$ 2,578	$ 2,807	$ 3,063	$ 3,308	$ 3,540	$ 3,752
Residual income			$ 6,278	$ 7,065	$ 7,599	$ 8,100	$ 8,553	$ 8,764
Discount factor			0.8889	0.7901	0.7023	0.6243	0.5549	
Present value of residual income			$ 5,581	$ 5,582	$ 5,337	$ 5,057	$ 4,746	
Cumulative present value of residual income			$ 5,581	$ 11,163	$ 16,500	$ 21,557	$ 26,303	
Terminal value of residual income							$ 54,039	
Beginning book value of equity							$ 20,624	
Value of equity							$100,966	
Common shares outstanding (thousands)							1,737	
Value of equity per share							$ 58.13	

The valuation process requires estimates of future net income and the book value of stockholder's equity. Exhibit 9.6 provides an example for the valuation of Syminex Corp. common stock as of 2005. In this relatively simple form, the valuation model requires estimates of six parameters:

- Sales growth.
- Net profit margin (Net income/Sales).
- Net working capital turnover (Sales/Net working capital).
- Fixed-asset turnover (Sales/Fixed assets).
- Financial leverage (Operating assets/Equity).
- Cost of equity capital.

Sales are expected to grow at 8.9% and 9.1% in 2006 and 2007, then trail off with growth rates of 8%, 7%, and 6% for the next three years. This five-year period is the forecast horizon, the period of time about which we have the greatest confidence in our estimates. We assume that sales will continue to grow with the long-run rate of inflation, 3.5%, thereafter.

Net profit margins are expected to increase to 9.2% and 9.4% over the next two years and to level off at that percentage thereafter. Net working capital and fixed-asset turnover rates are expected to remain at present levels of 11.8271 and 1.9878 times, respectively. Financial leverage is also expected to remain constant at the current level of 2.5186. Finally, the cost of equity capital is estimated at 12.5%.[1]

Net income is estimated using projected sales and projected net profit margin (Sales × Net profit margin). Net working capital and fixed assets are estimated using projected sales and the estimated turnover rates for net working capital and fixed assets, respectively (Sales/Turnover rate). Finally, equity is projected using the operating assets to equity ratio (Operating assets = Net working capital + Fixed assets).

Given these estimates, residual income for 2006 is estimated as projected net income less beginning of the year equity × the cost of equity capital of 12.5%,

$$\$6{,}278 = \$8{,}856 - (\$20{,}624 \times .125)$$

Subsequent years during the forecast horizon are computed similarly. Each year during the forecast horizon is, then, discounted at the cost of equity capital (12.5%). For example, the discount factor for the second year is computed as:

$$0.7901 = \frac{1}{1.125^2}$$

Present values for each year in the forecast horizon are summed to yield a cumulative present value through 2010 of $26,303.

The residual income projected in 2011 is assumed to grow at the rate of inflation (3.5%). The present value of this annuity, discounted to 2005 is:[2]

$$\$54{,}039 = \frac{\$8{,}764}{(.125 - .035)(1.125)^5}$$

The estimated value of Syminex common stock as of 2005 is equal to the book value of its stockholder's equity ($20,624) plus the present value of its residual income ($26,303 + $54,039) for a total of $100,966. Given outstanding shares of 1,737, per share value of Syminex common stock is $58.13.

Valuation of equity shares is critically dependent on the projection process. As discussed above, our valuation should closely examine the sensitivity of share price estimates to underlying assumptions in the projections.

[1] The cost of equity capital is given by the capital asset pricing model (CAPM): $r_e = r_f + \beta\,(r_m - r_f)$, where β is the beta of the stock (an estimate of its variability and reported by several services such as Standard and Poor's), r_f is the risk-free rate (commonly assumed as the 10-year government bond rate), and r_m is the expected return to the entire market. The expression $(r_m - r_f)$ is the "spread" of equities over the risk-free rate, often assumed to be around 5%. Given a 4% 10-year government bond rate and a $\beta = 1.7$, the cost of equity capital for Syminex is: $k = 4\% + 1.7\,(5\%) = 12.5\%$.

[2] The present value (PV) of annuity (A) expected to grow at g% per year and discounted at k% is given by $PV = \frac{A}{k - g}$. The remaining term in the denominator (1.125^5) discounts this PV, which occurs in Year 5, back to the present at the 12.5% cost of capital.

Trends in Value Drivers

The residual income model defines stock price as the book value of stockholders' equity plus the present value of expected residual income (RI), where $RI_t = NI_t - (k \times BV_{t-1})$. Residual income can also be expressed in ratio form as,

$$RI = (ROE_t - k) \times BV_{t-1}$$

where $ROE = NI_t/BV_{t-1}$. This form highlights the fact that stock price is only impacted so long as $ROE \neq k$. In equilibrium, competitive forces will tend to drive rates of return (ROE) to cost (k) so that abnormal profits are competed away. The estimation of stock price, then, amounts to the projection of the reversion of ROE to its long-run value for a particular company and industry.

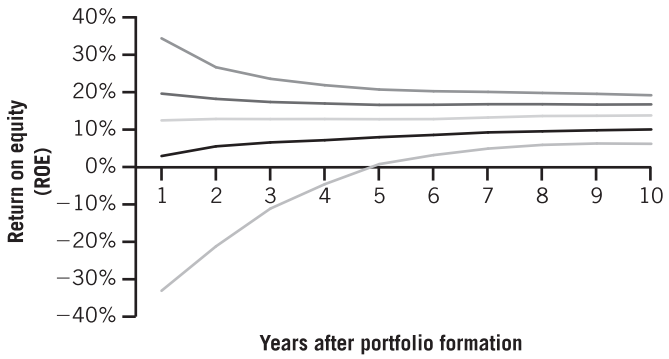
Exhibit 9.7 presents ROE performance for quintiles of all firms in the Compustat data base. For each year, portfolios of firms in each ROE quintile are formed and the ROEs for each firm in the portfolio are tracked for the subsequent 10 years. The graph presents the median value for each portfolio. Two observations are evident:

1. ROEs tend to revert to a long-run equilibrium. This reflects the forces of competition. Furthermore, the reversion rate for the least profitable firms is greater than that for the most profitable firms. And finally, reversion rates for the most extreme levels of ROE are greater than those for firms at more moderate levels of ROE.
2. The reversion is incomplete. That is, there remains a difference of about 12% between the highest and lowest ROE firms even after 10 years. This may be the result of two factors: differences in risk that are reflected in differences in their costs of capital (k); or, greater (lesser) degrees of conservatism in accounting policies.

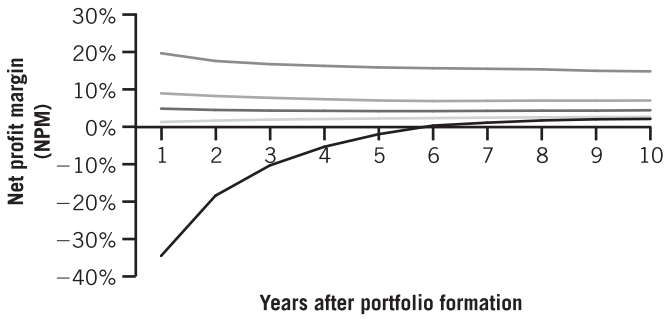
Exhibit 9.7 reveals that most of the reversion is complete after about 5 years. This lends support to our use of a 5-year forecast horizon for Syminex as there is little impact on share price after the point at which $ROE = k$ regardless of the growth rate assumption for sales.

ROE is considered a *value driver* since it is the variable that directly affects stock price. ROA is further disaggregated into profit margin and turnover (see Chapter 8). These components are also value drivers and are two of the input items we project in

Exhibit 9.7 **Reversion of ROE for Quintiles of Firms in the Compustat Database**



Reversion of Net Profit Margin for Quintiles of Firms in the Compustat Database ***Exhibit 9.8***



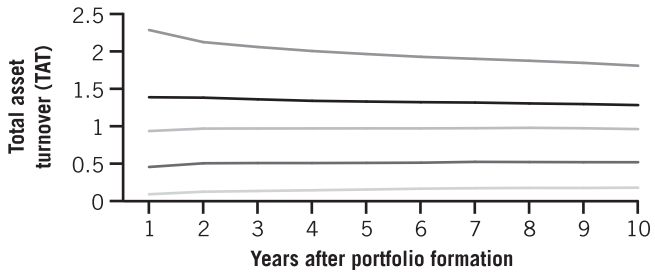
our valuation of Syminex. It is useful, therefore, to understand the reversion rates for these components as well.

Exhibit 9.8 presents a graph highlighting the reversion of net profit margins (NPM) for quintiles of firms in the Compustat database. It has been constructed similarly to the ROE graph in Exhibit 9.7. The marked reversion rates for the highest and lowest NPM firms are evident. In addition, the reversion rate for the lowest profit firms is greater than that for the most profitable firms and the reversion rates for both extreme groups are greater than those for less extreme profit firms. Finally, there remains a difference between the highest and lowest NPM portfolios at the end of 10 years of approximately the same spread as that for ROE. Much of the reversion in ROE, then, appears to be driven by reversion in NPM.

Total asset turnover (TAT) is the second component of ROA. In Exhibit 9.9 we present reversion rates for TAT that are constructed on the same basis as the previous graphs. Although some reversion is evident, it is much less than that of the profitability measures. In addition, there is a wide range of asset turnover rates between the highest and lowest turnover firms. This reflects varying degrees of capital intensity.

Our projection of profit margins and turnover rates needs to consider typical reversion patterns and the level of the drivers from their long-run average at the point when the estimation is made. Furthermore, we need to be mindful of industry characteristics as these exhibit marked differences along the net profit margin–total asset turnover

Reversion of Total Asset Turnover for Quintiles of Firms in the Compustat Database ***Exhibit 9.9***



dimension as discussed in Chapter 8. And finally, our projection horizon need not be excessively long as we lose confidence in our estimates and ROE tends to revert to close to the cost of capital over a relatively short period of time.

ANALYSIS VIEWPOINT ***. . . YOU ARE THE STOCKBROKER***

You are analyzing the long-term cash forecasts of Boston Biotech, Inc., that are reported along with a scheduled initial public offering (IPO) of its common stock for next month. You notice Boston Biotech's forecasts of net cash flows are zero or negative for the next five years. During this same time period, Boston Biotech is forecasting net income at more than 10% of equity. Your co-workers at the securities firm question the reliability of these forecasts. Can you identify potential explanations for the disparity between the five-year forecasts of cash flows and income?

APPENDIX 9A SHORT-TERM FORECASTING

For analysis of short-term liquidity, one of the most useful tools is **short-term cash forecasting.** Short-term cash forecasting is of interest to internal users like managers and auditors in evaluating a company's current and future operating activities. It is also of interest to external users like short-term creditors who need to assess a company's ability to repay short-term loans. Our analysis stresses short-term cash forecasting when a company's ability to meet current obligations is in doubt. The accuracy of cash flow forecasting is inversely related to the *forecast horizon*–the longer the forecast period, the less reliable the forecasts. This is due to the number and complexity of factors influencing cash inflows and outflows that cannot be reliably estimated in the long term. Even in the case of short-term cash forecasting, the information required is substantial. Since cash flow forecasting often depends on publicly available information, our objective is "reasonably accurate" forecasts. By studying and preparing cash flow forecasts, our analysis should achieve greater insights into a company's cash flow patterns.

CASH FLOW PATTERNS

It is important for us to review the nature of cash flow patterns before examining models for cash flow analysis and projection. Cash and cash equivalents (hereafter simply *cash*) are the most liquid of assets. Nearly all management decisions to invest in assets or pay expenses require the immediate or eventual use of cash. This results in management's focus on cash rather than on other concepts of liquid funds. Some users (like creditors) sometimes consider assets like receivables and inventories part of liquid assets given their near-term conversion into cash.

Holding cash provides little or no return and, in times of rising prices, cash (like all monetary assets) is exposed to purchasing power loss. Nevertheless, holding cash represents the least exposure to risk. Management is responsible for the decisions to invest cash in assets or to immediately pay costs. These *cash conversions* increase risk because the ultimate recovery of cash from these activities is less than certain. Risks associated with these cash conversions are of various types and degrees. For instance, risk in converting

cash into temporary investments is less than the risk in committing cash to long-term payout assets like plant and equipment. Investing cash in assets or costs aimed at developing and marketing new products often carries more serious cash-recovery risks. Both short-term liquidity and long-term solvency depend on the recovery and realizability of cash outlays.

Cash inflows and outflows are interrelated. A failure of any aspect of the company's business activities to successfully carry out its assigned task affects the entire cash flow system. A lapse in sales affects the conversion of finished goods into receivables and cash, leading to a decline in cash availability. A company's inability to replace this cash from sources like equity, loans, or accounts payable can impede production activities and produce losses in future sales. Conversely, restricting expenditures on items like advertising and marketing can slow the conversion of finished goods into receivables and cash. Long-term restrictions in either cash outflows or inflows can lead to company insolvency.

Our analysis must recognize the interrelations between cash flows, accruals, and profits. Sales is the driving source of operating flows. When finished goods representing the accumulation of many costs and expenses are sold, the company's profit margin produces an inflow of liquid funds through receivables and cash. The higher the profit margin, the greater the growth of liquid funds. Profits often primarily derive from the difference between sales and cost of sales (gross profit) and have enormous consequences to cash flows. Many costs, like those flowing from utilization of plant and equipment or deferred charges, do not require cash outlays. Similarly, items like long-term installment sales of land create noncurrent receivables limiting the relevance of accruals for cash flows. Our analysis must appropriately use these measures in assessing cash flow patterns.

Cash flows are limited in an important respect. As cash flows into a company, management has certain discretion in its disbursement. This discretion depends on commitments to outlays like dividends, inventory accumulation, capital expenditures, or debt repayment. Cash flows also depend on management's ability to draw on sources like equity and debt. With noncommitted cash inflows, referred to as free cash flows, management has considerable discretion in their use. It is this noncommitted cash component that is of special interest and importance for our analysis.

IMPORTANCE OF FORECASTING SALES

The reliability of our cash forecast depends on the *quality of the sales forecast.* With few exceptions, such as funds from financing or funds used in investing activities, most cash flows relate to and depend on sales. Our forecasting of sales includes an analysis of:

- Directions and trends in sales.
- Market share.
- Industry and economic conditions.
- Productive and financial capacity.
- Competitive factors.

These components are typically assessed along product lines potentially affected by forces peculiar to their markets. Later examples illustrate the importance of sales forecasts.

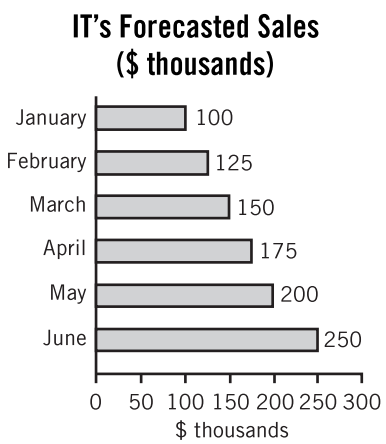
ANALYSIS VIEWPOINT ***. . . YOU ARE THE LOAN OFFICER***

As a recently hired loan officer at Intercontinental Bank you are processing a loan application for a new customer, DEC Manufacturing. In their application materials, DEC submits short-term sales forecasts for the next three periods of $1.1, $1.25, and $1.45 million, respectively. You notice the most recent two periods' sales are $0.8 and $0.65 million, and you ask DEC management for an explanation. DEC's response is twofold: (1) recent sales are misleading due to a work stoppage and an unusual period of abnormally high raw material costs due to bankruptcy of a major supplier; and (2) variations in consumer demand have caused recent industry volatility. Do you use their forecasts in your loan analysis?

CASH FLOW FORECASTING WITH PRO FORMA ANALYSIS

The reasonableness and feasibility of short-term cash forecasts are usefully checked by means of **pro forma financial statements.** We accomplish this by using assumptions underlying cash forecasts to construct a pro forma income statement for the forecast period and a pro forma balance sheet for the end of the forecast period. Financial ratios and other relations are derived from these pro forma financial statements and checked for feasibility against historical relations. These comparisons must recognize adjustments for factors expected to affect them during the cash forecast period.

We illustrate cash flow forecasting using financial data from IT Technologies, Inc. IT Technologies recently introduced a new electronic processor that has enjoyed excellent market acceptance. IT's management estimates sales ($ thousands) for the next six months ending June 30, Year 1, as: $100, $125, $150, $175, $200, and $250 (see the bar graph). The current cash balance at January 1, Year 1, is $15,000. In light of the predicted increase in sales, IT's treasurer hopes to maintain *minimum* monthly cash balances of $20,000 for January; $25,000 for February; $27,000 for March; and $30,000 for April, May, and June. The treasurer foresees a need for additional funds to finance sales expansion. The treasurer expects that new equipment valued at $20,000 will be purchased in February by giving a note payable to the seller. The note will be repaid, beginning in February, at the rate of $1,000 per month. The new equipment is not planned to be operational until August of Year 1.



The treasurer plans several further steps to fund these financing requirements. First, she obtains a financing commitment from an insurance company to acquire $110,000 of IT's long-term bonds (less $2,500 issue costs). These bond sales are planned for April ($50,000) and May ($60,000). She plans to sell real estate for additional financing, including $8,000 in May and $50,000 in June, and will sell equipment (originally costing $25,000 with a book value of zero) for $25,000 in June. The treasurer approaches IT's banker for approval of short-term financing to cover additional funding needs. The bank's loan officer requires the treasurer to prepare a *cash forecast* for the six months ending June 30, Year 1, along with *pro forma financial statements* for that period, to process her request. The loan officer also requests that IT Technologies specify its uses of cash and its sources of funds for loan repayment. The treasurer recognizes the importance of a cash forecast and proceeds to compile data necessary to comply with the loan officer's request.

As one of her first steps, the treasurer estimates the pattern of receivables collections. Prior experience suggests the following collection pattern:

Collections	Percent of Total Receivables
In month of sale	40%
In second month	30
In third month	20
In fourth month	5
Written off as bad debts	5
	100%

This collection pattern along with expected product sales allows the treasurer to construct estimates of cash collections shown in Exhibit 9A.1.

Exhibit 9A.1

Estimates of Cash Collections for Months January Through June, Year 1

	January	February	March	April	May	June
Sales	$100,000	$125,000	$150,000	$175,000	$200,000	$250,000
Collections of sales*						
1st month—40%	$ 40,000	$ 50,000	$ 60,000	$ 70,000	$ 80,000	$100,000
2nd month—30%		30,000	37,500	45,000	52,500	60,000
3rd month—20%			20,000	25,000	30,000	35,000
4th month—5%				5,000 ←	6,250 ←	7,500 ←
Total cash collections	$ 40,000	$ 80,000	$117,500	$145,000	$168,750	$202,500
Write-offs—5%				5,000 ←	6,250 ←	7,500 ←

* *For simplicity, cash collections from sales prior to January are ignored.*

Analyzing expense patterns in prior periods' financial statements yields expense estimates based on either sales or time. Exhibit 9A.2 shows these expense estimates. IT Technologies pays off these expenses (excluding the $1,000 monthly depreciation) when incurred. The only exception is for purchases of materials, where 50% is paid in the month of purchase and 50% in the following month. Materials inventory on January 1, Year 1, is $57,000. The treasurer estimates materials inventory for the end of each month from January to June of Year 1 as: $67,000, $67,500, $65,500, $69,000, $67,000, and $71,000, respectively. She also estimates the pattern of payments on accounts payable for these materials. Exhibit 9A.3 shows these expected payments. Since the electronic processor is manufactured to specific order, no finished goods inventories are expected to accumulate.

The treasurer's resulting cash forecast for each of the six months ending June 30, Year 1, is shown in Exhibit 9A.4. Using these forecasts, Exhibit 9A.5 shows IT Technologies' pro forma income statement for the six months ending June 30, Year 1. Also, both actual and pro forma balance sheets of

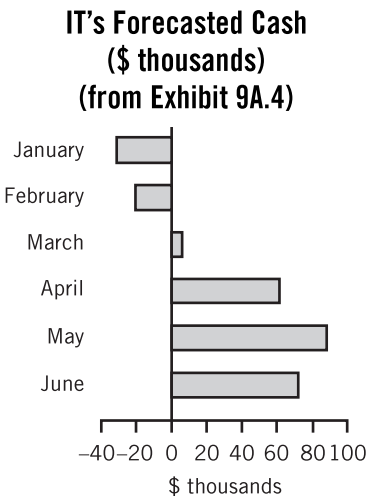


Exhibit 9A.2

Expense Estimates for Months January Through June, Year 1

Materials	30% of sales
Labor	25% of sales
Manufacturing overhead	
Variable	10% of sales
Fixed	$8,000 per month (includes $1,000 depreciation per month)
Selling expenses	10% of sales
General and administrative expenses	
Variable	8% of sales
Fixed	$7,000 per month

IT Technologies as of January 1 and June 30, respectively, of Year 1 are shown in Exhibit 9A.6.

Our prospective analysis should critically examine the pro forma statements and submit them to *feasibility tests* on both their forecasts and their assumptions. We should evaluate both ratios and relations revealed in pro forma financial statements and compare them to historical ratios to determine their reasonableness and feasibility. As an example, IT Technologies' current ratio increases from 2.6 on January 1, Year 1, to 3.5 in the pro forma balance sheet of June 30, Year 1. In addition, for the six months ended June 30, Year 1, the projected return on ending equity exceeds 9%. These and other measures such as turnover, trends, and common-size comparisons should be evaluated.

Exhibit 9A.3

Estimates of Cash Payments for Materials for Months January Through June, Year 1

	January	February	March	April	May	June
Materials purchases*	$40,000	$38,000	$43,000	$56,000	$58,000	$79,000
Payments						
1st month—50%	$20,000	$19,000	$21,500	$28,000	$29,000	$39,500
2nd month—50%		20,000	19,000	21,500	28,000	29,000
Total payments	$20,000	$39,000	$40,500	$49,500	$57,000	$68,500

* *Material purchases reconcile with material costs and changes in inventories.*

Exhibit 9A.4

IT TECHNOLOGIES, INC.
Cash Forecast
For Months January through June, Year 1

	January	February	March	April	May	June	Six-Month Totals
Cash balance—beginning	$ 15,000	$ 20,000	$ 25,750	$ 27,250	$ 30,580	$ 30,895	$ 15,000
Add cash receipts for							
Cash collections (Exh. 9A.1)	40,000	80,000	117,500	145,000	168,750	202,500	753,750
Sale of real estate*	—	—	—	—	8,000	50,000	58,000
Sale of bonds*	—	—	—	47,500	60,000	—	107,500
Sale of equipment*	—	—	—	—	—	25,000	25,000
Total cash available	55,000	100,000	143,250	219,750	267,330	308,395	959,250
Less cash disbursements for							
Materials (Exh. 9A.3)	20,000	39,000	40,500	49,500	57,000	68,500	274,500
Labor†	25,000	31,250	37,500	43,750	50,000	62,500	250,000
Fixed overhead†	7,000	7,000	7,000	7,000	7,000	7,000	42,000
Variable overhead†	10,000	12,500	15,000	17,500	20,000	25,000	100,000
Selling expenses†	10,000	12,500	15,000	17,500	20,000	25,000	100,000
General and administrative†	15,000	17,000	19,000	21,000	23,000	27,000	122,000
Taxes‡	—	—	—	—	—	19,000	19,000
Purchase of fixed assets*	—	1,000	1,000	1,000	1,000	1,000	5,000
Total cash disbursements	87,000	120,250	135,000	157,250	178,000	235,000	912,500
Tentative cash balance (deficit)	(32,000)	(20,250)	8,250	62,500	89,330	73,395	46,750
Minimum cash required*	20,000	25,000	27,000	30,000	30,000	30,000	—
Borrowing required	52,000	46,000	19,000	—	—	—	117,000
Repayment of loan	—	—	—	30,000	58,000	29,000	(117,000)
Interest paid on balance§	—	—	—	1,920	435	145	2,500
Ending cash balance	$20,000	$ 25,750	$ 27,250	$ 30,580	$ 30,895	$ 44,250	$ 44,250
Loan balance	$52,000	$ 98,000	$117,000	$ 87,000	$ 29,000	—	—

* *Treasurer's expectations taken from information on prior pages.*
† *Estimates computed using information from Exhibit 9A.2.*
‡ *Taxes total a 40% combined state and federal rate. Taxes of $19,000 are paid in June, with the balance accrued.*
§ *Interest is computed at the rate of ½% per month and paid at month-end. Any loan is taken out at the beginning of a month.*

Unexpected variations in important relations should be either explained or adjustments made to assumptions and expectations if errors are identified. These steps increase the reliability of pro forma statements for our analysis.

We should recognize that electronic spreadsheet programs are available to assist us in pro forma analysis. The ease of changing variables for sensitivity tests improves the usefulness of pro forma statements. Nevertheless, we should not confuse the ease and flexibility of these programs with the crucial need to develop and verify estimates and assumptions underlying their output. The reasonableness of important estimates and assumptions, and the usefulness of this analysis, depend on our critical evaluation and judgment and *not* on our technology.

Exhibit 9A.5

IT TECHNOLOGIES, INC.
Pro Forma Income Statement
For Six Months Ended June 30, Year 1

		Source of Estimate
Sales	$1,000,000	Forecasted sales
Cost of sales		
Materials	300,000	Exhibit 9A.2
Labor	250,000	Exhibit 9A.2
Overhead	148,000	Exhibit 9A.2
Total cost of sales	698,000	
Gross profit	302,000	
Selling expense	100,000	Exhibit 9A.2
Bad debts expense	18,750	Exhibit 9A.1
General and administrative expense	122,000	Exhibit 9A.2
Operating expenses	240,750	
Operating income	61,250	
Gain on sale of equipment	25,000	Treasurer
Interest expense	(2,500)	Exhibit 9A.4 note
Income before taxes	83,750	
Income taxes (40% rate)	33,500	Exhibit 9A.4 note
Net income	$ 50,250	

GUIDANCE ANSWERS TO ANALYSIS VIEWPOINTS

STOCKBROKER

The disparity in Boston Biotech's forecasts of cash flows and income is not necessarily of concern. Many growing companies experience little to no positive cash flows in the near term. Of course, these low near-term cash flows are expected to yield above-average cash flows in the future. Boston Biotech could potentially be recording substantial operating cash flows that are offset by large cash outflows in new investments, debt retirements, or dividends. Our analysis must look to the components of both cash flows and income to address our potential interest in Boston Biotech's IPO of common stock. Instead of spurning the stock of Boston Biotech, we might find it a lucrative and underpriced security due to our superior knowledge of accounting in financial statements.

LOAN OFFICER

Your first step is to corroborate or refute management's explanation for decreased sales in recent years. If their explanations are *not* validated with objective evidence, then you should reject DEC's application–hint of unscrupulous behavior is reason enough for immediate nonapproval. If you are able to verify management's explanations, your next step is to assess the *level and uncertainty* of DEC's sales forecasts. Your analysis of sales forecasts should consider important economic factors, including consumer demand, industry competition, supplier costs, and DEC's productive

Exhibit 9A.6

IT TECHNOLOGIES, INC.
Balance Sheets

	Actual January 1, Year 1		Pro Forma June 30, Year 1	
Assets				
Current assets				
Cash	$ 15,000		$ 44,250	
Accounts receivable (net)	6,500		234,000	
Inventories—materials	57,000		71,000	
Total current assets		$ 78,500		$349,250
Real estate	58,000		—	
Fixed assets	206,400		201,400	
Accumulated depreciation	(36,400)		(17,400)	
Net fixed assets		228,000		184,000
Other assets		3,000		3,000
Deferred bond issue costs		—		2,500
Total assets		$309,500		$538,750
Liabilities and Equity				
Current liabilities				
Accounts payable	$ 2,000		$ 41,500	
Notes payable	28,500		43,500	
Accrued taxes	—		14,500	
Total current liabilities		$ 30,500		$ 99,500
Long-term debt	15,000		125,000	
Common stock	168,000		168,000	
Retained earnings	96,000	279,000	146,250	439,250
Total liabilities and equity		$309,500		$538,750

capacity/quality. Perhaps more important given DEC's circumstances is your assessment of uncertainty with sales. For example, sales might be objectively forecasted at $1 million, but the range of likely sales might extend anywhere from $0.5 to $1.5 million. Recent volatility in consumer demand, material costs, and supplier relations suggests substantially greater risk than normal. Your assessment of increased risk can yield a response extending from a slight increase in interest rates or increased collateral demands to ultimate loan rejection. Consequently, while DEC's sales forecasts might be unbiased, we must recognize differences in uncertainty associated with sales forecasts in practice.

[Superscript A denotes assignments based on Appendix 9A.]

QUESTIONS

9–1. What are some of the uses for prospective analysis?

9–2. What steps must usually take place before the forecasting process can begin?

9–3. In addition to recent trends, what other items of information might be brought to bear in the projection of sales?

9–4. What is the forecast horizon?

9–5. What assumption is usually made about sales growth at the end of the forecast horizon?

9–6. Describe the steps in forecasting the income statement.

9–7. Describe the two-step process of forecasting the balance sheet.

9–8. What are value drivers?

9–9. Describe the typical trend of value drivers over time.

9–10[A]. Why are short-term cash forecasts important for the analysis of financial statements?

9–11[A]. What limitations are associated with short-term cash forecasting?

9–12[A]. Describe the relation between inflows of cash and outflows of cash.

9–13[A]. It is often asserted: *From an operational point of view, management focuses on cash rather than working capital.* Do you agree with this statement? Why or why not?

9–14[A]. Describe the primary difference between "funds flow" analysis and ratio analysis. Which analysis technique is preferred and why?

9–15[A]. What is the usual first step in preparing cash forecasts, and what considerations are required in this step?

EXERCISES

EXERCISE 9–1

Forecasting Income and Income Components

Refer to the financial statements of **Quaker Oats Company** in Problem 9–6. Prepare a forecasted income statement for Year 12 using the following assumptions ($ millions):

1. Revenues are forecast to equal $6,000.
2. Cost of sales forecast uses the average percent relation between cost of sales and sales for the three-year period ending June 30, Year 11.
3. Selling, general, and administrative expenses are expected to increase by the same percent increase occurring from Year 10 to Year 11.
4. Other expenses are predicted to be 8% higher than in Year 11.
5. A $2 million loss (net of taxes) is expected from disposal of net assets from discontinued operations.
6. Interest expense, net of interest capitalized and interest income, is expected to increase by 6% due to increased financial needs.
7. The effective tax rate is equal to that of Year 11.

CHECK
Forecast NI, $140.1 mil.

EXERCISE 9–2

Forecasting Sales and Net Income

Quarterly sales and net income data for **General Electric** for Year 1 through Year 9 are shown below ($ millions).

General Electric

	Sales	Net Income		Sales	Net Income		Sales	Net Income
Dec. Y1	$17,349	$1,263	Sep. Y4	$14,442	$1,457	Jun. Y7	$21,860	$2,162
Mar. Y2	12,278	964	Dec. Y4	17,528	1,685	Sep. Y7	21,806	2,014
Jun. Y2	13,984	1,130	Mar. Y5	14,948	1,372	Dec. Y7	24,876	2,350
Sep. Y2	13,972	996	Jun. Y5	17,630	1,726	Mar. Y8	22,459	1,891
Dec. Y2	16,040	1,215	Sep. Y5	17,151	1,610	Jun. Y8	24,928	2,450
Mar. Y3	12,700	1,085	Dec. Y5	19,547	1,865	Sep. Y8	23,978	2,284
Jun. Y3	14,566	656	Mar. Y6	16,931	1,517	Dec. Y8	28,455	2,671
Sep. Y3	14,669	1,206	Jun. Y6	18,901	1,908	Mar. Y9	24,062	2,155
Dec. Y3	17,892	1,477	Sep. Y6	19,861	1,788	Jun. Y9	27,410	2,820
Mar. Y4	12,621	1,219	Dec. Y6	22,848	2,067			
Jun. Y4	14,725	1,554	Mar. Y7	19,998	1,677			

Required:

Use these data and any other historical information available to forecast sales and net income for each of the quarters ending September Year 9, December Year 9, March Year 10, and June Year 10. Explain the basis of your forecasts.

EXERCISE 9–3
Forecasting Sales and Net Income

In Year 2006, Cough.com is in its second year of operations. Cough.com produces children's cough medicine. Industry sales of children's cough medicine for 2005 totaled $3 billion. For 2005, Cough.com had sales totaling $2.4 million (.08% market share).

Required:

a. Explain how predictions of the total market and market share can be used in the forecasting process.

b. What data might you seek to enhance your sales forecast and how might such data be gathered?

c. Illustrate what-if scenarios in which market share gained by Cough.com is (1) 5% greater than and (2) 5% worse than the predicted .08% of the Year 2006 expected industry sales of $3.2 billion.

d. For *each* of these two separate scenarios, illustrate what-if analysis when total expected industry sales of $3.2 billion are (1) 10% greater than and (2) 10% worse than expected.

CHECK
(*c*) 1. $2.688 mil.

EXERCISE 9–4[A]
Preparing a Short-Term Cash Forecast

The Lyon Corporation is a merchandising company. Prepare a short-term cash forecast for July of Year 6 following the format of Exhibit 9A.4. Selected financial data from Lyon Corporation as of July 1 of Year 6 are reproduced below ($ thousands):

Cash, July 1, Year 6	$ 20
Accounts receivable, July 1, Year 6	20
Forecasted sales for July	150
Forecasted accounts receivable, July 31, Year 6	21
Inventory, July 1, Year 6	25
Desired inventory, July 31, Year 6	15
Depreciation expense for July	4
Miscellaneous outlays for July	11
Minimum cash balance desired	30
Accounts payable, July 1, Year 6	18

Additional Information:

1. Gross profit equals 20% of cost of goods sold.
2. Lyon purchases all inventory on the second day of the month and receives it the following week.
3. Lyon pays 75% of payables within the month of purchase and the balance in the following month.
4. Lyons pays all remaining expenses in cash.

CHECK
Cash bal., $54

PROBLEMS

PROBLEM 9–1
Preparing Pro Forma Financial Statements

Comparative income statements and balance sheets for **Coca-Cola** are shown below ($ millions).

	Year 2	Year 1
Income Statement		
Net sales	$20,092	$19,889
Cost of goods	6,044	6,204
Gross profit	14,048	13,685
Selling, general, and administrative expense	7,893	9,221
Depreciation and amortization expense	803	773
Interest expense (revenue)	(308)	292
Income before tax	5,660	3,399
Income tax expense	1,691	1,222
Net income	$ 3,969	$ 2,177
Outstanding shares	3,491	3,481

(continued)

PROBLEM 9–1
(concluded)

	Year 2	Year 1
Balance Sheet		
Cash	$ 1,934	$ 1,892
Receivables	1,882	1,757
Inventories	1,055	1,066
Other current assets	2,300	1,905
Total current assets	7,171	6,620
Property, plant, and equipment	7,105	6,614
Accumulated depreciation	2,652	2,446
Net property, plant, and equipment	4,453	4,168
Other noncurrent assets	10,793	10,046
Total assets	$22,417	$20,834
Accounts payable and Accrued liabilities	$ 3,679	$ 3,905
Short-term debt and current maturities of long-term debt	3,899	4,816
Income tax liabilities	851	600
Total current liabilities	8,429	9,321
Deferred income taxes and other liabilities	1,403	1,362
Long-term debt	1,219	835
Total noncurrent liabilities	2,622	2,197
Common stock	873	870
Capital surplus	3,520	3,196
Retained earnings	20,655	18,543
Treasury stock	13,682	13,293
Shareholders' equity	11,366	9,316
Total liabilities and equity	$22,417	$20,834

Required:

a. Use the following ratios to prepare a projected income statement, balance sheet, and statement of cash flows for Year 3.

Sales growth	1.02%
Gross profit margin	69.92%
Selling, general, and administrative expense/Sales	39.28%
Depreciation expense/Prior-year PPE gross	12.14%
Interest expense/Prior-year long-term debt	5.45%
Income tax expense/Pretax income	29.88%
Accounts receivable turnover	10.68
Inventory turnover	5.73
Accounts payable turnover	1.64
Taxes payable/Tax expense	50.33%
Total assets/Stockholders' equity (financial leverage)	2.06
Dividends per share	$1.37
Capital expenditures/Sales	5.91%

b. Based on your initial projections, how much external financing (long-term debt and/or stockholders' equity) will Coca-Cola need to fund its growth at projected increases in sales?

PROBLEM 9–2
Preparing Pro Forma Financial Statements

Comparative income statements and balance sheets for **Best Buy** are shown below ($ millions). **Best Buy**

	Year 2	Year 1
Income Statement		
Net sales	$15,326	$12,494
Cost of goods	12,267	10,101
Gross profit	3,059	2,393
Selling, general and administrative expense	2,251	1,728
Depreciation and amortization expense	167	103
Income before tax	641	562
Income tax expense	245	215
Net income	$ 396	$ 347
Outstanding shares	208	200

Balance Sheet	Year 2	Year 1
Cash	$ 746	$ 751
Receivables	313	262
Inventories	1,767	1,184
Other current assets	102	41
Total current assets	2,928	2,238
Property, plant, and equipment	1,987	1,093
Accumulated depreciation	543	395
Net property, plant, and equipment	1,444	698
Other noncurrent assets	466	59
Total assets	$ 4,838	$ 2,995
Accounts payable and accrued liabilities	$ 2,473	$ 1,704
Short-term debt and current maturities of long-term debt	114	16
Income tax liabilities	127	65
Total current liabilities	2,714	1,785
Long-term liabilities	122	100
Long-term debt	181	15
Total long-term liabilities	303	115
Common stock	20	20
Capital surplus	576	247
Retained earnings	1,225	828
Shareholders' equity	1,821	1,095
Total liabilities and equity	$ 4,838	$ 2,995

Required:

a. Use the following ratios to prepare a projected income statement, balance sheet, and statement of cash flows for Year 3.

Sales growth	22.67%
Gross profit margin	19.96%
Selling, general, and administrative expense/Sales	14.69%
Depreciation expense/Prior-year PPE gross	15.28%
Income tax expense/Pretax income	38.22%
Accounts receivable turnover (Sales/Accounts receivable)	48.96
Inventory turnover (Cost of goods sold/Inventory)	6.94
Accounts payable turnover (Cost of goods sold/Accounts payable)	4.96
Taxes payable/Tax expense	51.84%
Total assets/Stockholders' equity (financial leverage)	2.55
Dividends per share	$ 0.00
Capital expenditures/Sales	6.71%

b. Based on your initial projections, how much external financing (long-term debt and/or stockholders' equity) will Best Buy need to fund its growth at projected increases in sales?

PROBLEM 9–3
Preparing Pro Forma Financial Statements

Comparative income statements and balance sheets for **Merck** ($ millions) follow: **Merck**

	Year 2	Year 1
Income Statement		
Net sales	$47,716	$40,343
Cost of goods	28,977	22,444
Gross profit	18,739	17,899
Selling, general and administrative expense	6,531	6,469
Depreciation and amortization expense	1,464	1,277
Interest expense	342	329
Income before tax	10,402	9,824
Income tax expense	3,121	3,002
Net income	$ 7,282	$ 6,822
Outstanding shares	2,976	2,968
Balance Sheet		
Cash	$ 3,287	$ 4,255
Receivables	5,215	5,262
Inventories	3,579	3,022
Other current assets	880	1,059
Total current assets	12,961	13,598
Property, plant, and equipment	18,956	16,707
Accumulated depreciation	5,853	5,225
Net property, plant, and equipment	13,103	11,482
Other noncurrent assets	17,942	15,075
Total assets	$44,006	$40,155
Accounts payable and accrued liabilities	$ 5,904	$ 5,391
Short-term debt and current maturities of long-term debt	4,067	3,319
Income taxes payable	1,573	1,244
Total current liabilities	11,544	9,954

(continued)

PROBLEM 9–3 *(concluded)*

	Year 2	Year 1
Deferred income taxes and other liabilities	11,614	11,768
Long-term debt	4,799	3,601
Total noncurrent liabilities	16,413	15,369
Common stock	30	30
Capital surplus	6,907	6,266
Retained earnings	31,500	27,395
Treasury stock	(22,387)	(18,858)
Shareholders' equity	16,050	14,833
Total liabilities and equity	$44,007	$40,154

Required:

a. Use the following ratios to prepare a projected income statement, balance sheet, and statement of cash flows for Year 3.

Sales growth	18.27%
Gross profit margin	39.27%
Selling, general, and administrative expense/Sales	13.69%
Depreciation expense/Prior-year property, plant & equipment (gross)	8.76%
Interest expense/Prior-year long-term debt	4.94%
Income tax expense/Pretax income	30.00%
Accounts receivable turnover (Sales/Accounts receivable)	9.15
Inventory turnover (Cost of goods sold/Inventory)	8.10
Accounts payable turnover (Cost of goods sold/Accounts payable)	4.91
Taxes payable/Tax expense	50.41%
Total assets/Stockholders' equity (financial leverage)	2.35
Dividends per share	$ 1.06
Capital expenditures/Sales	9.04%

b. Based on your initial projections, how much external financing (long-term debt and/or stockholders' equity) will Merck need to fund its growth at projected increases in sales?

PROBLEM 9–4 *Using Prospective Analysis to Value Securities*

Following are financial statement information for Welmark Corporation as of Year 2 and Year 3.

WELMARK CORPORATION

	Year 2	Year 3
Sales growth	8.50%	10.65%
Net profit margin (Net income/Sales)	6.71%	8.22%
Net working capital turnover (Sales/Average net working capital)	8.98	9.33
Fixed asset turnover (Sales/Average fixed assets)	1.67	1.64
Total operating assets/Total equity	1.96	2.01
Number of shares outstanding	1,737	1,737
($ thousands)		
Sales	$25,423	$28,131
Net income	1,706	2,312
Net working capital	2,832	3,015
Fixed assets	15,232	17,136
Total operating assets	18,064	20,151
Long-term liabilities	8,832	10,132
Total stockholders' equity	9,232	10,019

Required:

Using the residual income model, prepare a valuation of the common stock of Welmark Corporation as of Year 3 under the following assumptions:

a. Forecast horizon of five years

b. Sales growth of 10.65% per year over the forecast horizon and 3.5% thereafter.

c. All financial ratios remain at Year 3 levels

d. Cost of equity capital is 12.5%

PROBLEM 9–5[A]

Preparing Pro Forma Financial Statements

Telnet Corporation is a newly formed computer manufacturer. Telnet plans to begin operations on January 1, Year 2. Selected financial information is available for the preparation of Telnet's six-month forecasted performance covering the period January 1 to June 30 of Year 2.

Forecasted *monthly* sales	$250,000
Monthly operating expenses	
Labor	30,500
Rent for factory	10,000
Variable overhead	22,500
Depreciation on equipment	35,000
Amortization of patents	500
Selling and administrative expenses	47,500
Materials	125,000

Additional Information:

1. Collection period ..... 45 days
2. Purchase terms n/30
3. Ending finished goods inventory $100,000
4. Ending raw material inventory ..... $ 35,000
5. Effective tax rate 50%
6. Beginning cash balance ..... $ 60,000
7. Minimum cash balance required ..... $ 40,000
8. Prepaid expenses on June 30, Year 2 ..... $ 7,000
9. No inventory is in process on June 30, Year 2.
10. Sales are made evenly throughout the period.
11. Expenses are paid in cash (unless otherwise indicated).
12. Telnet Corporation's balance sheet data on January 1, Year 2, appears as:

Cash	$ 60,000	Patents	$ 40,000
Equipment	1,200,000	Shareholders' equity	1,300,000

CHECK
(*a*) NI, $8,000
(*b*) Total assets, $1,584,000
(*c*) Borrowing, $143,000

Required:

a. Prepare a pro forma income statement to portray the forecasted financial position of Telnet Corporation for the six-month period ended June 30, Year 2.

b. Prepare a pro forma balance sheet as of June 30, Year 2.

c. Prepare a cash forecast analysis as in Exhibit 9A.4 for the six-month period ended June 30, Year 2.

PROBLEM 9–6
Forecasting the Statement of Cash Flows

Refer to the following financial statements of **Quaker Oats Company.**

Quaker Oats Company

INCOME STATEMENT

Year ended June 30 ($ millions except per share data)	Year 11	Year 10	Year 9
Net sales	$5,491.2	$5,030.6	$4,879.4
Cost of goods sold	2,839.7	2,685.9	2,655.3
Gross profit	2,651.5	2,344.7	2,224.1
Selling, general and administrative expenses	2,121.2	1,844.1	1,779.0
Interest expense—net of $9.0, $11.0 and $12.4 interest income	86.2	101.8	56.4
Other expense—net	32.6	16.4	149.6
Income from continuing operations before income taxes	411.5	382.4	239.1
Provision for income taxes	175.7	153.5	90.2
Income from continuing operations	235.8	228.9	148.9
Income (loss) from discontinued operations—net of tax	(30.0)	(59.9)	54.1
Net income	205.8	169.0	203.0
Preferred dividends—net of tax	4.3	4.5	—
Net income available for common	$ 201.5	$ 164.5	$ 203.0
Per common share			
Income from continuing operations	$ 3.05	$ 2.93	$ 1.88
Income (loss) from discontinued operations	(.40)	(.78)	.68
Net income	$ 2.65	$ 2.15	$ 2.56
Dividends declared	$ 1.56	$ 1.40	$ 1.20
Average Number of common shares outstanding (in 000's)	75,904	76,537	79,307

BALANCE SHEET

June 30 ($ millions)	Year 11	Year 10	Year 9
Assets			
Current assets			
Cash and cash equivalents	$ 30.2	$ 17.7	$ 21.0
Short-term investments, at cost which approximates market	—	0.6	2.7
Receivables—net of allowances	691.1	629.9	594.4
Inventories			
Finished goods	309.1	324.1	326.0
Grain and raw materials	86.7	110.7	114.1
Packaging materials and supplies	26.5	39.1	39.0
Total inventories	422.3	473.9	479.1
Other current assets	114.5	107.0	94.2
Net current assets of discontinued operations	—	252.2	328.5
Total current assets	1,258.1	1,481.3	1,519.9
Other receivables and investments	79.1	63.5	26.4
Property, plant, and equipment	1,914.6	1,745.6	1,456.9
Less accumulated depreciation	681.9	591.5	497.3
Properties—net	1,232.7	1,154.1	959.6

(continued)

PROBLEM 9–6
(continued)

June 30 ($ millions) Assets	Year 11	Year 10	Year 9
Intangible assets, net of amortization	446.2	466.7	484.7
Net non-current assets of discontinued operations	—	160.5	135.3
Total assets	$3,016.1	$3,326.1	$3,125.9
Liabilities and Equity			
Current liabilities			
Short-term debt	$ 80.6	$ 343.2	$ 102.2
Current portion of long-term debt	32.9	32.3	30.0
Trade accounts payable	350.9	354.0	333.8
Accrued payrolls, pensions, and bonuses	116.3	106.3	118.1
Accrued advertising and merchandising	105.7	92.6	67.1
Income taxes payable	45.1	36.3	8.0
Payable to Fisher-Price	29.6	—	—
Other accrued liabilities	165.8	173.8	164.9
Total current liabilities	926.9	1,138.5	824.1
Long-term debt	701.2	740.3	766.8
Other liabilities	115.5	100.3	89.5
Deferred income taxes	366.7	327.7	308.4
Preferred stock, no par value, authorized 1,750,000 shares:			
issued 1,282,051 of $5.46 cumulative convertible shares in Year 9 (liquidating preference $78 per share)	100.0	100.0	100.0
Deferred compensation	(94.5)	(98.2)	(100.0)
Treasury preferred stock, at cost, 10,089 shares at June 30, Year 11	(.7)	—	—
Common shareholders' equity			
Common stock, $5 par value, authorized 200,000,000 shares; issued 83,989,396 shares	420.0	420.0	420.0
Additional paid-in capital	7.2	12.9	18.1
Reinvested earnings	1,047.5	1,164.7	1,106.2
Cumulative exchange adjustment	(52.9)	(29.3)	(56.6)
Deferred compensation	(168.0)	(164.1)	(165.8)
Treasury common stock, at cost, 7,660,675 shares; 8,402,871 shares; and 5,221,981 shares, respectively	(352.8)	(386.7)	(184.8)
Total common shareholders' equity	901.0	1,017.5	1,137.1
Total liabilities and common shareholders' equity	$3,016.1	$3,326.1	$3,125.9

Using Quaker's financial statements and the analysis guidance from the chapter, prepare a forecasted statement of cash flows for Year 12 using the following information:

Selected Forecast Data ($ millions)	Year 12
Sources of cash	
Assets retirements	$ 20
Uses of cash	
Repayment of long-term debt	45
Capital expenditures—Property, plant, and equipment	300
Cash dividends on capital stock	135
Other cash expenditures	30
Revenue forecast	6,000

Additional assumptions for your forecasting task include:

1. Income from continuing operations in Year 12 is expected to equal the average percentage of income from continuing operations to sales for the three-year period ending June 30, Year 11.
2. The depreciation and amortization forecast for Year 12 uses the average percentage relation of depreciation and amortization to income from continuing operations for the period Year 9 through Year 11. The average is computed at 82.33%.
3. Forecasts of deferred income taxes (noncurrent portion) and other items in Year 12 reflect the past three years' relation of deferred taxes (noncurrent) and other items to total income from continuing operations of 22.9%.
4. Provisions for restructuring charges are predicted to be zero for Year 12.
5. Days' sales in receivables is expected to be 42 for Year 12.
6. Days' sales in inventory of 55 and a ratio of cost of sales to sales of 0.51 are forecasted for Year 12.
7. Changes in other current assets are predicted to be equal to the average increase/decrease over the period Year 9 through Year 11 of $25.6.
8. Days' purchases in accounts payable of 45 is forecasted for Year 12, and purchases are expected to increase in Year 12 by 12% over Year 11 purchases of $2,807.20.
9. Change in other current liabilities is predicted to be equal to the average increase/decrease over the period Year 9 through Year 11 of $24.5.
10. There are no expected discontinued operations.
11. Decreases in short-term debt are predicted at $40 million each year.
12. No cash inflows are expected from issuance of debt for spin-off and no cash effects from purchases or issuances of common and preferred stock.
13. Predicted year-end cash needs are equal to a level measured by the ratio of cash to revenues prevailing in Year 11.
14. Additions to long-term debt in Year 12 are equal to the amount needed to meet the desired year-end cash balance.

CASES

CASE 9–1
Forecasting Pro Forma Financial Statements

Refer to the following financial statements for **Kodak:** **Kodak**

INCOME STATEMENT

For Year Ended December 31 (in millions)	20x6	20x5	20x4
Net sales	$13,234	$13,994	$14,089
Cost of goods sold	8,670	8,375	8,086
Gross profit	4,564	5,619	6,003
Selling, general, and administrative expenses	2,781	2,665	2,846
Research and development costs	779	784	817
Restructuring costs (credits) and other	659	(44)	350
Earnings from operations	345	2,214	1,990
Interest expense	219	178	142
Other income (charges)	(18)	96	261
Earnings before income taxes	108	2,132	2,109
Provision for income taxes	32	725	717
Net earnings	$ 76	$ 1,407	$ 1,392

BALANCE SHEET

At December 31 (in millions, except share and per share data)	20x6	20x5
Assets		
Current assets		
Cash and cash equivalents	$ 448	$ 246
Receivables, net	2,337	2,653
Inventories, net	1,137	1,718
Deferred income taxes	521	575
Other current assets	240	299
Total current assets	4,683	5,491
Property, plant, and equipment, net	5,659	5,919
Goodwill, net	948	947
Other long-term assets	2,072	1,855
Total assets	$13,362	$14,212
Liabilities and shareholders' equity		
Current liabilities		
Accounts payable and other current liabilities	$ 3,276	$ 3,403
Short-term borrowings	1,378	2,058
Current portion of long-term debt	156	148
Accrued income taxes	544	606
Total current liabilities	5,354	6,215
Long-term debt, net of current portion	1,666	1,166
Postemployment liabilities	2,728	2,722
Other long-term liabilities	720	681
Total liabilities	10,468	10,784
Shareholders' equity		
Common stock, $2.50 par value 950,000,000 shares authorized: issued 391,292,760 shares in 20x6 and 20x5; 290,929,701 and 290,484,266 shares outstanding in 20x6 and 20x5	978	978
Additional paid in capital	849	871
Retained earnings	7,431	7,869
Accumulated other comprehensive loss	(597)	(482)
	8,661	9,236
Treasury stock, at cost; 100,363,059 shares in 20x6 and 100,808,494 shares in 20x5	(5,767)	(5,808)
Total shareholders' equity	2,894	3,428
Total liabilities and shareholders' equity	$13,362	$14,212

Required:

Prepare forecasts of its income statement, balance sheet, and statement of cash flows for 20x7 under the following assumptions:

a. All financial ratios remain at 20x6 levels.

b. Kodak will not record restructuring costs for 20x7.

c. Taxes payable are at the 20x6 level of $544 million.

d. Depreciation expense charged to SG&A is $765 million and $738 million for 20x6 and 20x5, respectively.

e. Gross PPE is $12,982 million and $12,963 million for 20x6 and 20x5, respectively.

f. Projected current maturities of long-term debt are $13 million for 20x7.

CASE 9–2

Preparing and Analyzing Cash Forecasts

Miller Company is planning to construct a two-unit facility for the loading of beverage barrels onto ships. On or before January 1, Year 2, stockholders will invest $100,000 in the company's capital stock to provide the initial working capital. To finance the construction program (total planned cost is $1,800,000) the company will obtain a commitment from a lending organization for a loan of $1,800,000. This loan is to be secured by a 10-year mortgage note bearing interest at 5% per year on the unpaid balance. The principal amount of the loan is to be repaid in equal semiannual installments of $100,000 beginning June 30, Year 3. Since loan proceeds will only be required as construction work progresses, the company agrees to pay a commitment fee beginning January 1, Year 2, equal to 1 percent per year on the unused portion of the loan commitment. This fee is payable when amounts are "drawn down" except for the first draw-down.

Work on the construction of the facility will commence in the fall of Year 1. The first payment to the contractors is due on January 1, Year 2, at which time the commitment and loan agreement become effective and the company will make its first draw-down for payment to the contractors in the amount of $800,000. As construction progresses, additional payments will be made to the contractors by drawing down the remaining loan proceeds as follows (payments to contractors are made on the same dates as the loan proceeds are drawn down):

April 1, Year 2	$500,000	December 31, Year 2	$100,000
July 1, Year 2	300,000	April 1, Year 3	100,000

Because of weather conditions, the facility operates from April 1 through November 30 of each year. The construction program will permit the completion of the first of two plant units (capable of handling 5,000,000 barrels) in time for its use during the Year 2 shipping season. The second unit (capable of handling an additional 3,000,000 barrels) will be completed in time for the Year 3 season. It is expected 5,000,000 barrels will be handled by the facility during the Year 2 season. Thereafter, barrels handled are expected to increase in each subsequent year by 300,000 barrels until a level of 6,500,000 barrels is reached. The company's revenues are derived by charging the consignees of the beverage for its services at a fixed rate per barrel loaded. All revenues are collected in the month of shipment. Based upon past experience with similar facilities, Miller Company expects operating profit to average $0.04 per barrel before charges for interest, financing fees, and depreciation. Depreciation is $0.03 per barrel.

Required:

Prepare a cash forecast for each of the three calendar years: Year 2, Year 3, and Year 4. Evaluate the sufficiency of cash obtained from the issuance of capital stock, draw-downs on the loan, and the operating facility to cover cash payments to the contractor and the creditor (principal and interest).

CHECK

Ending cash:
Year 2, $1,929,000
Year 3, $254,500

CASE 9–3

Preparing a Cash Forecast for a Company in Distress

Royal Company has incurred substantial losses for several years and is insolvent. On March 31, Year 5, Royal petitions the court for protection from creditors and submits the following balance sheet:

ROYAL COMPANY
Balance Sheet
March 31, Year 5

	Book Value	Liquidation Value
Assets		
Accounts receivable	$100,000	$ 50,000
Inventories	90,000	40,000
Plant and equipment	150,000	160,000
Total assets	$340,000	$250,000
Liabilities and Stockholders' Equity		
Accounts payable—general creditors	$600,000	
Common stock	60,000	
Retained earnings	(320,000)	
Total liabilities and equity	$340,000	

Royal's management informed the court that the company developed a new product and a prospective customer is willing to sign a contract for the purchase of (at a price of $90 per unit) 10,000 units during the year ending March 31, Year 6; 12,000 units during the year ending March 31, Year 7; and 15,000 units during the year ending March 31, Year 8. The product can be manufactured using Royal's current facilities. Monthly production with immediate delivery is expected to be uniform within each year. Receivables are expected to be collected during the calendar month following sales. Production costs per unit for the new product are:

Direct materials .....$20 Direct labor.....$30 Variable overhead $10

Fixed costs (excluding depreciation) amount to $130,000 per year. Purchases of direct materials are paid during the calendar month following purchase. Fixed costs, direct labor, and variable overhead are paid as incurred. Inventory of direct materials are equal to 60 days' usage. After the first month of operations during which Royal will order 90 days' supply, 30 days' usage of direct materials is ordered each month.

Creditors have agreed to reduce their total claims to 60% of their March 31, Year 5, balances under two conditions:

1. Existing accounts receivable and inventories are liquidated immediately with the proceeds going to creditors.
2. The remaining balance in accounts payable is paid as cash is produced from future operations—but in no event is it to be paid later than March 31, Year 7. No interest is paid on these obligations.

Under this proposal, creditors would receive $110,000 more than the current liquidation value of Royal's assets. The court engages you to determine the feasibility of this proposal.

Required:

CHECK
Ending cash bal.:
Year 6, $75,000
Year 7, $15,000

Prepare a cash forecast for years ending March 31, Year 6 and Year 7. Ignore any need to borrow and repay short-term funds for working capital purposes and show the cash expected to be available to pay creditors, the actual payments to creditors, and the cash remaining after payments to creditors.

(AICPA Adapted)

CASE 9–4
Comprehensive Analysis of Loan Request

You are a loan officer for Pacific Bank. The senior loan officer submits to you the following selected financial information as of September 30, Year 6, for Union Corporation, which has filed a loan application:

Current assets	
Cash	$ 12,000
Accounts receivable	10,000
Inventory	63,600
Plant and equipment, net	100,000
Total liabilities	0
Actual sales	
September, Year 6	40,000
Forecasted sales	
October, Year 6	48,000
November, Year 6	60,000
December, Year 6	80,000
January, Year 7	36,000

Sales are 75% for cash and 25% on account. Receivables are collected in full in the month following the sale. For example, the accounts receivable balance of $10,000 on September 30, Year 6, equals 25% of the sales from September, of which all $10,000 is paid in October. Gross profit averages 30% of sales *before* purchase discounts. Therefore, the gross invoice cost of goods sold is 70% of sales. Union Corp. carries $30,000 of inventory plus additional inventory sufficient to provide for the anticipated sales of the following month. Purchase terms are 2/10, n/30. Since purchases are made early in each month and all discounts are taken, payments are consistently made in the month of purchase.

Salaries and wages average 15% of sales, rent averages 5% of sales, and all other expenses (except depreciation) average 4% of sales. These expenses are paid in cash when incurred. Depreciation expense is $750 per month, computed on a straight-line basis. Equipment expenditures are forecasted at $600 in October and $400 in November. Depreciation on these new expenditures is not recorded until Year 7. Union Corp. maintains a minimum cash balance of $8,000. Any borrowings are made at the beginning of the month and any repayments are made at the end of the month, both in multiples of $1,000 (excluding interest). Interest is paid when the principal is repaid, equal to a rate of 6% per year.

Required:

a. The senior loan officer requests you prepare the following schedules for the months of October, November, and December, and for the total three months (quarter) ending in December of Year 6:
(1) Estimated total cash receipts.
(2) Estimated cash disbursements for purchases (purchases are 70% of sales for the following month).
(3) Estimated cash disbursements for operating expenses.
(4) Estimated total cash disbursements.
(5) Estimated net cash receipts and disbursements.
(6) Estimated financing required.

b. For the three months (quarter) ending in December of Year 6, prepare a:
(1) Forecasted income statement (ignore taxes).
(2) Forecasted balance sheet.