Prospective Analysis

9

CHAPTER

McGraw-Hill/Irwin

Prospective Analysis

Importance

Security Valuation - free cash flow and residual income models require estimates of future financial statements.

Management Assessment - forecasts of financial performance examine the viability of companies' strategic plans.

Assessment of Solvency - prospective analysis is useful to creditors to assess a company's ability to meet debt service requirements, both short-term and long-term.

The Projection Process

Projected Income Statement

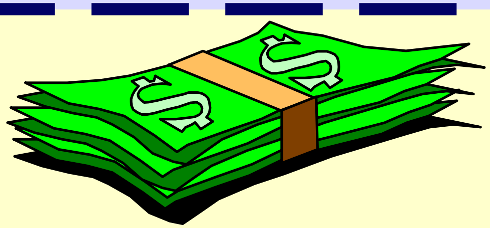
Sales forecasts are a function of:

1) Historical trends

2) Expected level of macroeconomic activity

3) The competitive landscape

4) Strategic initiatives of management



The Projection Process

Projected Income Statement

Steps:

1) Project sales
2) Project cost of goods sold and gross profit margins using historical averages as a percent of sales
3) Project SG&A expenses using historical averages as a percent of sales
4) Project depreciation expense as an historical average percentage of beginning-of-year depreciable assets
5) Project interest expense as a percent of beginning-of-year interest-bearing debt using existing rates if fixed and projected rates if variable
6) Project tax expense as an average of historical tax expense to pre-tax income

The Projection Process

Target Corporation
Projected Income 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

The Projection Process

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

The Projection Process

Projected Balance Sheet

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.
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 Projection Process

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 Projection Process

Target Corporation Projected Balance Sheet

(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%

The Projection Process

Projected Balance Sheet

2 Step Process:

1) Project initial cash balance

2) Increase (decrease) liabilities and equity as necessary to achieve historical percentage of cash to total assets. Fund (repay) with historical proportion of debt and equity.

The Projection Process

Projected Statement of Cash Flows

Target Corporation Projected Statement of Cash Flows

(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

The Projection Process

Sensitivity Analysis

- Vary projection assumptions (e.g., sales growth, expense percentages, turnover rate) to find those with the greatest effect on projected profits and cash flows

- Examine the influential variables closely

- Prepare expected, optimistic, and pessimistic scenarios to develop a range of possible outcomes

Application of Prospective Analysis in the Residual Income Valuation Model

The residual income valuation model expresses stock price in terms of prospective earnings and book values in the following equation:

$$V_t = BV_t + \frac{NI_{t+1} - (k \times BV_t)}{(1+k)} + \frac{NI_{t+2} - (k \times BV_{t+1})}{(1+k)^2} + \cdots$$

Where BV_t is book value at the end of period t, NI_{t+n} is net 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, $RI_t = Ni_t – (k \text{ X } BV_{t-1})$.

In its simplest form, we can perform a valuation by projecting the following 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

Application of Prospective Analysis in the Residual Income Valuation Model

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	

Value Drivers

The Residual Income valuation model defines residual income as:

$$RI_t = Ni_t - (k \times BV_{t-1})$$

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

Where ROE $= NI/BV_{t-1}$

- Shareholder value is created so long as ROE > k

- ROE is a value driver as are its components

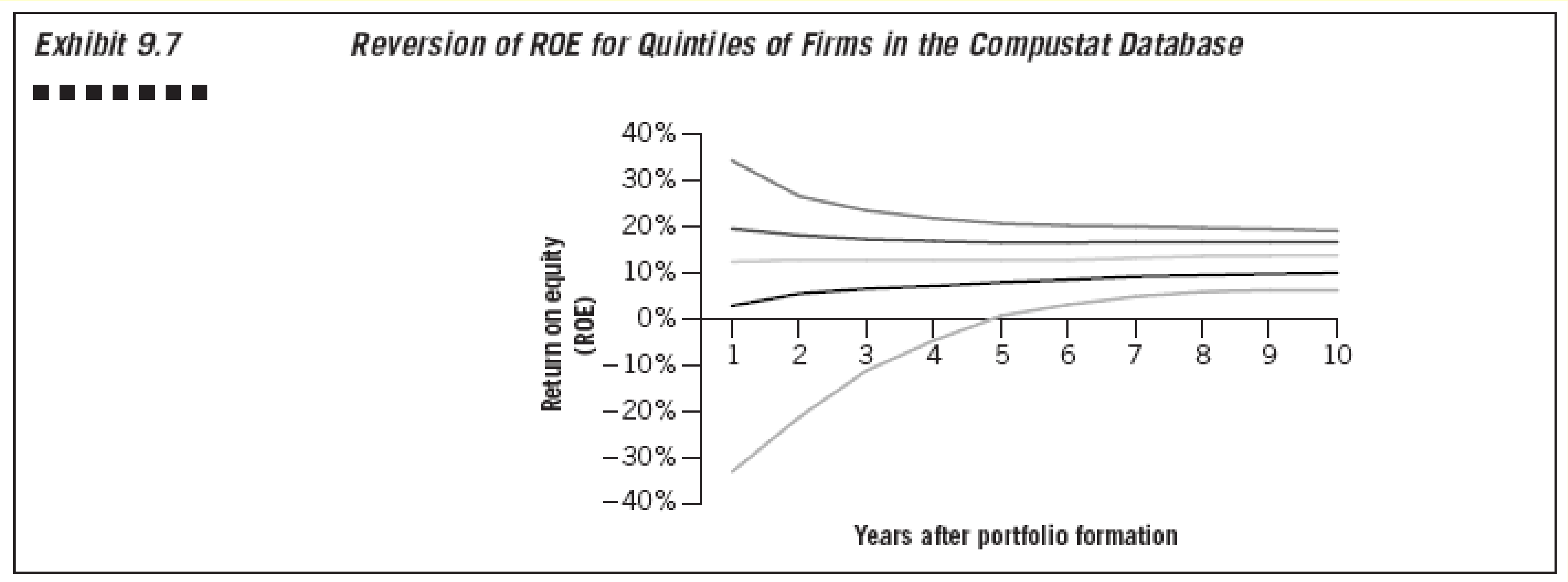
- Net Profit Margin

- Asset Turnover

- Financial leverage

Value Drivers

Reversion of ROE

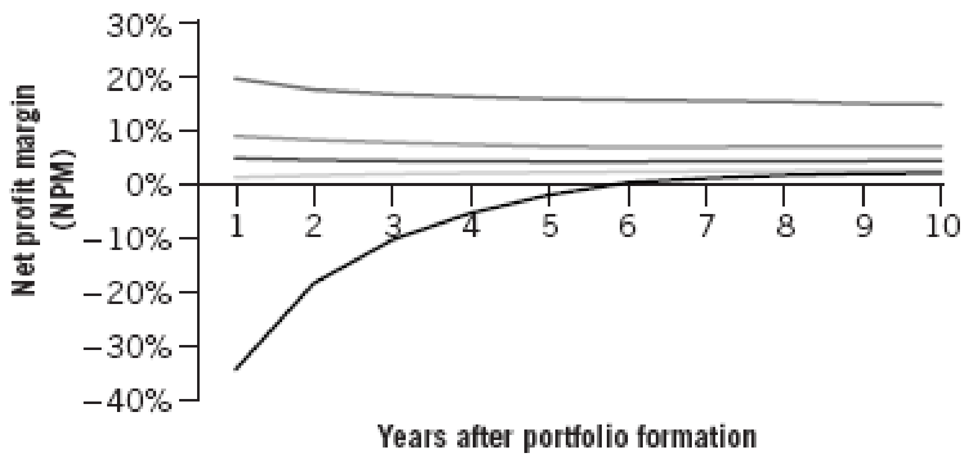


Value Drivers

Reversion of Net Profit Margin

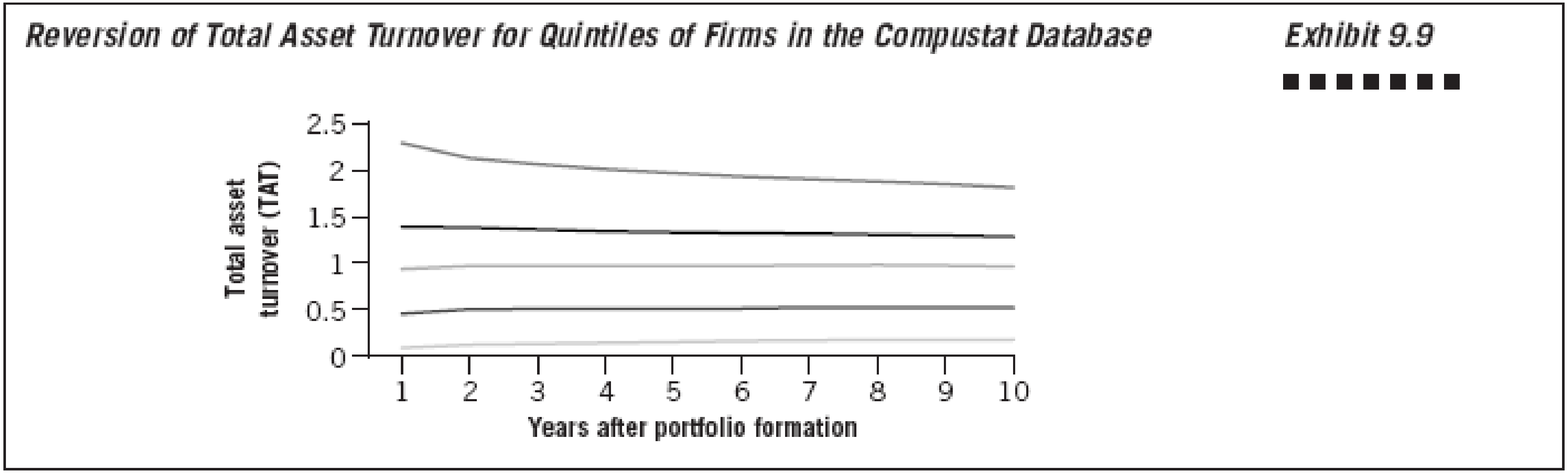
Reversion of Net Profit Margin for Quintiles of Firms in the Compustat Database

Exhibit 9.8



Value Drivers

Reversion of Asset Turnover



Short-Term Forecasting

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	—	—