INVESTMENTS

SEVENTH EDITION

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616   PART V   Security Analysis

<table>
<tr><td rowspan="3">CONCEPT
CHECK
3</td><td>(a) Calculate the price of a firm with a plowback ratio of 0.60 if its ROE is 20%. Current earnings, E_1, will be $5 per share, and $k = 12.5\%$.

(b) What if ROE is 10%, which is less than the market capitalization rate? Compare the firm's price in this instance to that of a firm with the same ROE and E_1, but a plowback ratio of $b = 0$.</td></tr>
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Life Cycles and Multistage Growth Models

As useful as the constant-growth DDM formula is, you need to remember that it is based on a simplifying assumption, namely, that the dividend growth rate will be constant forever. In fact, firms typically pass through life cycles with very different dividend profiles in different phases. In early years, there are ample opportunities for profitable reinvestment in the company. Payout ratios are low, and growth is correspondingly rapid. In later years, the firm matures, production capacity is sufficient to meet market demand, competitors enter the market, and attractive opportunities for reinvestment may become harder to find. In this mature phase, the firm may choose to increase the dividend payout ratio, rather than retain earnings. The dividend level increases, but thereafter it grows at a slower rate because the company has fewer growth opportunities.

Table 18.2 illustrates this pattern. It gives Value Line's forecasts of return on assets, dividend payout ratio, and 3-year growth rate in earnings per share for a sample of the

TABLE 18.2

Financial ratios in two industries

	Return on Assets	Payout Ratio	Growth Rate 2005–2008
Computer Software			
Adobe Systems	21.5%	1.0%	8.2%
Cognizant	19.0	0.0	22.8
Compuware	10.5	0.0	17.6
Intuit	19.0	0.0	8.0
Microsoft	31.5	35.0	15.4
Novell	8.5	0.0	51.8
Oracle	33.0	0.0	18.6
Red Hat	17.0	0.0	17.6
Parametric Tech	20.0	0.0	33.9
SAP	22.5	18.0	13.8
Median	19.5%	0.0	17.6%
Electric Utilities			
Central Hudson G&E	6.0%	78.0%	5.1%
Central Vermont	7.5	60.0	8.0
Consolidated Edison	5.0	75.0	1.0
Duquesne Light	8.0	85.0	7.7
Energy East	6.0	74.0	4.1
Northeast Utilities	5.0	59.0	14.0
Nstar	8.5	61.0	3.2
Pennsylvania Power	11.0	52.0	9.3
Public Services Enter.	7.0	62.0	1.7
United Illuminating	5.0	113.0	1.3
Median	6.5%	68.0%	4.6%

firms included in the computer software industry versus those of East Coast electric utilities. (We compare return on assets rather than return on equity because the latter is affected by leverage, which tends to be far greater in the electric utility industry than in the software industry. Return on assets measures operating income per dollar of total assets, regardless of whether the source of the capital supplied is debt or equity. We will return to this issue in the next chapter.)

By and large, the software firms have attractive investment opportunities. The median return on assets of these firms is forecast to be 19.5%, and the firms have responded with high plowback ratios. Most of these firms pay no dividends at all. The high return on assets and high plowback result in rapid growth. The median growth rate of earnings per share in this group is projected at 17.6%.

In contrast, the electric utilities are more representative of mature firms. Their median return on assets is lower, 6.5%; dividend payout is higher, 68%; and median growth is lower, 4.6%.

We conclude that the higher payouts of the electric utilities reflect their more limited opportunities to reinvest earnings at attractive rates of return. Consistent with this view, Microsoft's announcement in 2004 that it would sharply increase its dividend and initiate multi-billion-dollar stock buybacks was widely seen as an indication that the firm was maturing into a lower-growth stage. It was generating far more cash than it had the opportunity to invest attractively, and so was paying out that cash to its shareholders.

To value companies with temporarily high growth, analysts use a multistage version of the dividend discount model. Dividends in the early high-growth period are forecast and their combined present value is calculated. Then, once the firm is projected to settle down to a steady-growth phase, the constant-growth DDM is applied to value the remaining stream of dividends.

We can illustrate this with a real-life example. Figure 18.2 is a Value Line Investment Survey report on Hewlett-Packard. Some of the relevant information at the end of 2005 is highlighted.

HP's beta appears at the circled A, its recent stock price at the B, the per-share dividend payments at the C, the ROE (referred to as "return on shareholder equity") at the D, and the dividend payout ratio (referred to as "all dividends to net profits") at the E. The rows ending at C, D, and E are historical time series. The boldfaced, italicized entries under 2006 are estimates for that year. Similarly, the entries in the far right column (labeled 08–10) are forecasts for some time between 2008 and 2010, which we will take to be 2009.

Value Line projects rapid growth in the near term, with dividends rising from $.32 in 2006 to .50 in 2009. This rapid growth rate cannot be sustained indefinitely. We can obtain dividend inputs for this initial period by using the explicit forecasts for 2006 and 2009 and linear interpolation for the years between:

| 2006 | $.32 | 2008 | $.44 |
| 2007 | $.38 | 2009 | $.50 |

Now let us assume the dividend growth rate levels off in 2009. What is a good guess for that steady-state growth rate? Value Line forecasts a dividend payout ratio of 0.19 and an ROE of 16.0%, implying long-term growth will be

$$g = \text{ROE} \times b = 16.0\% \times (1 - 0.19) = 13.0\%$$