As we noted in the text, analysts often provide nonconstant estimates of future growth. We can use a modified version of the DCF procedure for nonconstant growth from Chapter 10 to estimate the cost of equity. Suppose the current dividend is $2.16 per share and the current actual price is $32 per share. Analysts forecast growth of 11% the first year, 10% the second year, 9% the third year, 8% the fourth year, and 7% thereafter. Given these estimates of growth, we can construct a time line with expected future dividend payments. For example, the dividend at Year 1 is $D_1 = D_0(1 + g) = 2.16(1 + 0.11) = 2.40. The estimates of growth and expected future dividends for Years 1 through 5 are shown in Table 10B-1.

Note that dividends grow at a constant rate after Year 4. Therefore, we can use the constant dividend growth formula to determine the price at Year 4, based on the Year 5 dividend and the long-term constant growth rate:

\[ P_4 = \frac{D_5}{(r_s - g)} \]  

(10B-1)

To find the current price, \( P_0 \), we must calculate the present value of the future expected dividend payments for Years 1 through 4, and then add to that the present value of the price at Year 4, \( P_4 \). This calculation is shown in Equation 10B-2:

\[
P_0 = \left[ \frac{D_1}{(1 - r_s)^1} + \frac{D_2}{(1 + r_s)^2} + \frac{D_3}{(1 + r_s)^3} + \frac{D_4}{(1 + r_s)^4} \right] + \frac{P_4}{(1 + r_s)^4} \\
= \left[ \frac{D_1}{(1 - r_s)^1} + \frac{D_2}{(1 + r_s)^2} + \frac{D_3}{(1 + r_s)^3} + \frac{D_4}{(1 + r_s)^4} \right] \left[ \frac{D_5}{(r_s - g)} \right]/(1 + r_s)^4
\]

(10B-2)
We know the current price, the expected future dividends, and the long-term constant growth rate. Substituting these known values into Equation 10B-2 gives the following equation:

\[
\begin{align*}
$32.00 &= \left[ \frac{$2.40}{(1 - r_s)^1} + \frac{$2.64}{(1 + r_s)^2} + \frac{$2.87}{(1 + r_s)^3} + \frac{$3.10}{(1 + r_s)^4} \right] + \left[ \frac{$3.32}{(r_s - 0.07)} \right] \\
&= \text{(10B-2a)}
\end{align*}
\]

We have good news, bad news, and good news. The good news is that \( r_s \) is the only unknown variable in Equation 10B-2a, so we can solve for it. The bad news is that the only way to solve for \( r_s \) is by an iterative process. But the second piece of good news is that the iterative process is very easy to implement with a spreadsheet. Using the Goal Seek feature of Excel, we find that \( r_s = 14.9\% \).

See the worksheet Web 10B in the file IFM10 Ch10 Tool Kit.xls for an illustration of this approach.