Finance: Valuation of Dividends and Horizon Value

Given Data

- **Dividend at Year 3 (D_3):** \$4.25
- **Growth rate for dividends after Year 3 and Year 4 (g_3):** 22.10%
- **Growth rate after Year 5 (constant growth rate, g):** 4.08%
- **Required return (r):** 13.60%

Calculations

Step 1: Calculate Dividends for Year 4 and Year 5

Formula:

$$D_n = D_{n-1} \times (1 + g_3)$$

Year 4 Dividend:

$$D_4 = D_3 \times (1 + g_3)$$
$$D_4 = 4.25 \times (1 + 0.2210)$$
$$D_4 = 4.25 \times 1.221$$
$$D_4 = 5.19$$

Explanation: This is the expected dividend in Year 4 after applying the growth rate of 22.10%.

Year 5 Dividend:

$$D_5 = D_4 \times (1 + g_3)$$
$$D_5 = 5.19 \times (1 + 0.2210)$$
$$D_5 = 5.19 \times 1.221$$
$$D_5 = 6.34$$

Explanation: This is the expected dividend in Year 5 after applying the second year's growth rate of 22.10%.

Step 2: Calculate the Horizon Value at the End of Year 5

Formula:

$$V_5 = \frac{D_6}{r - g}$$

Calculate D_6:

$$D_6 = D_5 \times (1 + g)$$
$$D_6 = 6.34 \times (1 + 0.0408)$$
$$D_6 = 6.34 \times 1.0408$$
$$D_6 = 6.60$$

Explanation: D_6 is the expected dividend in Year 6 based on the constant growth rate of 4.08%.

Calculate the Horizon Value V_5:

$$V_5 = \frac{6.60}{0.1360 - 0.0408}$$
$$V_5 = \frac{6.60}{0.0952}$$
$$V_5 = 69.33$$

Explanation: This is the expected value of the stock at the end of Year 5, based on the expected dividend and constant growth rate.

Step 3: Calculate the Current Intrinsic Value

The current intrinsic value is the present value of all expected future dividends, including the horizon value at Year 5.

Formula for the Present Value (PV) of each dividend:

$$PV = \frac{D_n}{(1 + r)^n}$$

Present Value of Dividends:

- **Year 3:**
  $$PV_3 = \frac{4.25}{(1 + 0.1360)^3}$$
  $$PV_3 = \frac{4.25}{1.464}$$
  $$PV_3 = 2.90$$
- **Year 4:**
  $$PV_4 = \frac{5.19}{(1 + 0.1360)^4}$$
  $$PV_4 = \frac{5.19}{1.661}$$
  $$PV_4 = 3.12$$
- **Year 5:**
  $$PV_5 = \frac{6.34}{(1 + 0.1360)^5}$$
  $$PV_5 = \frac{6.34}{1.887}$$
  $$PV_5 = 3.36$$

Present Value of Horizon Value:

$$PV_{Horizon} = \frac{69.33}{(1 + 0.1360)^5}$$
$$PV_{Horizon} = \frac{69.33}{1.887}$$
$$PV_{Horizon} = 36.74$$

Final Intrinsic Value Calculation

Sum of all Present Values:

$$Intrinsic\ Value = PV_3 + PV_4 + PV_5 + PV_{Horizon}$$
$$Intrinsic\ Value = 2.90 + 3.12 + 3.36 + 36.74$$
$$Intrinsic\ Value = 46.12$$

Explanation: The intrinsic value is the sum of the present values of all expected future dividends and the horizon value.

Results

- **Horizon value:** \$69.33
- **Current intrinsic value:** \$46.12

Market Equilibrium Statement Analysis

"Investors prefer the deferred tax liability that capital gains offer over dividends" - This statement is a possible explanation for why Goodwin Technologies hasn't paid a dividend yet. Tax policies can influence a firm's payout decisions, and capital gains can be more tax-efficient compared to dividend income.

Conclusion

- The horizon value at the end of Year 5 is \$69.33.

- The current intrinsic value of Goodwin Technologies is \$46.12.

- The given statement regarding investors' preference for deferred tax liability via capital gains over dividends is likely accurate and explains the firm's dividend policy.