
CHAPTER 5

STOCK VALUATION AT RAGAN THERMAL SYSTEMS

1. The total dividend paid by the company were \$108,000. Since there are 100,000 shares outstanding, the total earnings for the company were:

$$\text{Total earnings} = 100,000(\$4.32) = \$432,000$$

This means the payout ratio was:

$$\text{Payout ratio} = \$108,000/\$432,000 = 0.25$$

So, the retention ratio was:

$$\text{Retention ratio} = 1 - .25 = 0.75$$

Using the retention ratio, the company's growth rate is:

$$g = \text{ROE} \times b = .25(.75) = .1875 \text{ or } 18.75\%$$

Now we can value the company using the entire dividend payment. The total value of the company's equity under these assumptions is:

$$\text{Total equity value} = D_1 / (R - g)$$

$$\text{Total equity value} = \$108,000(1.1875) / (.20 - .1875)$$

$$\text{Total equity value} = \$10,260,000$$

So, the value per share is:

$$\text{Value per share} = \$10,260,000 / 100,000$$

$$\text{Value per share} = \$102.60$$

2. Since Expert HVAC had a write off which affected its earnings per share, we need to recalculate the industry EPS. So, the industry EPS is:

$$\text{Industry EPS} = (\$.82 + 1.32 + 2.34) / 3 = \$1.49$$

Using this industry EPS, the industry payout ratio is:

$$\text{Industry payout ratio} = \$0.41/\$1.49 = .2746 \text{ or } 27.46\%$$

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So, the industry retention ratio is

$$\text{Industry retention ratio} = 1 - .2746 = .7254 \text{ or } 72.54\%$$

This means the industry growth rate is:

$$\text{Industry } g = .13(.7254) = .0946 \text{ or } 9.46\%$$

The company will continue to grow at its current pace for five years before slowing to the industry growth rate. So, the total dividends for each of the next six years will be:

$$D_1 = \$108,000.00(1.1875) = \$128,250.00$$

$$D_2 = \$128,250.00(1.1875) = \$152,296.88$$

$$D_3 = \$152,296.88(1.1875) = \$180,852.54$$

$$D_4 = \$180,852.54(1.1875) = \$214,762.39$$

$$D_5 = \$214,762.39(1.1875) = \$255,030.34$$

$$D_6 = \$255,030.34(1.0741) = \$279,155.75$$

The total value of the stock in Year 5 with the industry required return will be:

$$\text{Stock value in Year 5} = \$279,155.75 / (.1167 - .0943) = \$12,649,539.17$$

This means the total value of the stock today is:

$$\text{Value of stock today} = \$128,250/1.1167 + \$152,296.88/1.1167^2 + \$180,852.54/1.1167^3 + \\ \$214,762.39/1.1167^4 + (\$255,030.34 + 12,649,539.17) / 1.1167^5$$

$$\text{Value of stock today} = \$7,937,335.93$$

And the value per share of the stock today is:

$$\text{Value per share} = \$7,937,335.93 / 100,000$$

$$\text{Value per share} = \$79.37$$

Notice that even though the growth rate used was lower after the next five years, the stock price increased because of the lower required return.

3. Using the revised industry EPS, the industry PE ratio is:

$$\text{Industry PE} = \$25.43 / \$1.49 = 17.03$$

Using the original stock price assumption, Ragan's PE ratio is:

$$\text{Ragan PE (original assumptions)} = \$20.52 / \$4.32 = 4.75$$

$$\text{Using the revised assumptions, Ragan's PE} = \$78.29 / \$4.32 = 18.12$$

Obviously, using the original assumptions, Ragan's PE is too high. The PE using the revised assumptions is close to the industry PE ratio. Using the industry average PE, we can calculate a stock price for Ragan, which is:

$$\text{Stock price implied by industry PE} = 18.12(\$4.32) = \$73.57$$

4. Here, we must make an assumption. We have two estimates of the required return. Since we are assuming the growth rate follows the growth rate assumption in Question 2, we will use the industry average required return assumed in that question as well. So, the value of Ragan as a cash cow is:

$$\text{Cash cow value} = \$108,000 / .1167 = \$925,449.87$$

The total stock value with growth from Question 2 is \$7,829,042.43, so the percentage of the value of the company not attributable to growth opportunities is:

$$\text{Percentage of value not attributable to growth opportunities} = \$925,449.87 / \$7,829,042.43 = .1182$$

So, the percentage of the company's value attributable to growth opportunities is:

$$\text{Percentage of value attributable to growth opportunities} = 1 - .1182 = .8818 \text{ or } 88.18\%$$

5. Again, we will assume the results in Question 2 are correct. The growth rate of the company we calculated in this question was the industry growth rate of 7.41 percent. Since the growth rate is:

$$g = \text{ROE} \times b$$

If we assume the payout ratio remains constant, the ROE is:

$$.0943 = \text{ROE}(.75)$$

$$\text{ROE} = .1257 \text{ or } 12.57\%$$

6. The most obvious solution is to retain more of the company's earnings and invest in profitable opportunities. This strategy will not work if the return on the company's investment is lower than the required return on the company's stock.