

MIT SLOAN SCHOOL OF MANAGEMENT

J. Wang
E52-456

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1. Company XYZ's year-end dividend will be \$1. It will grow at 10% for 10 years and then slows down to 5% per year forever. The cost of capital for XYZ is 15%. What is the price of company XYZ?

Answer:

We consider the second stage-growth first.

So in 10 years, the value of XYZ will be

$$\frac{1 \times (1+10\%)^{10}}{15\% - 5\%} = \$25.937$$

So the value today is:

$$\frac{1}{15\%} * [1 - (\frac{1+10\%}{1+15\%})^{10}] + \frac{25.937}{(1+15\%)^{10}} = \$13.589$$

2. MetaTrend Corps. earns a book rate of return (ROE) of 12%. It reinvests one-half its earnings and pays out the other half as cash dividends. The nominal cost of capital is 12%.
 - (a) Given this ROE and dividend payout ratio, what is the growth rate of MetaTrend's earnings and dividends?
 - (b) Assume this growth rate is expected to continue in perpetuity. What is the present value of MetaTrend shares? Assume that book value per share is \$10.
 - (c) Suppose MetaTrend decides to pay out all its earnings as cash dividends. Therefore it does not grow. What is the change, if any, in MetaTrend's stock price? Why?

Answer:

- (a) We can use the growth formula

$$\begin{aligned} \text{growth} &= \text{ROE} \times (1 - \text{payout ratio}) \\ &= 0.12 \times (1 - 0.5) \\ &= 0.06 \end{aligned}$$

- (b) We can apply the formula of DDM with constant growth

$$\begin{aligned} P_{\text{MetaTrend}} &= \frac{\text{book value} \times \text{ROE} \times \text{payout ratio}}{\text{cost of capital} - \text{growth}} \\ &= \frac{10 \times 0.12 \times 0.5}{0.12 - 0.06} \\ &= 10 \end{aligned}$$

(c) We can apply the formula of DDM with no growth

$$\begin{aligned} P_{\text{MetaTrend}} &= \frac{\text{book value} \times \text{ROE} \times \text{payout ratio}}{\text{cost of capital}} \\ &= \frac{10 \times 0.12}{0.12} \\ &= 10 \end{aligned}$$

The price is same as that of part a. The reason is that the dividends gave up exactly offset the present value of the increase of future cash flows, ie ROE = cost of capital.