Constant growth rate model: Price and dividends

November 10, 2012

The present value of a share of stock is discounted future cash flows. Future cash flows are either dividends or the sale of the stock at some point in the future. Irregardless, the present value of the stock can be represented by:

$$P = \sum_{t=1}^{\infty} \frac{CF_t}{(1 + R_s)^t} \tag{1}$$

If we presume the only cash flows are dividends D_t, and those dividends grow at the constant rate g, Eq. (1) simplifies to:

$$P_0 = \frac{D_1}{R_s - g} \tag{2}$$

The price next period is represented by:

$$P_1 = \frac{D_2}{R_s - g} \tag{3}$$

Substituting $D_2 = D_1 (1 + g)$ into Eq. (3) we shall see that $P_1 = P_0 (1 + g)$:

$$\begin{aligned} P_1 &= \frac{D_1 (1 + g)}{R_s - g} \\ &= \left(\frac{D_1}{R_s - g} \right) (1 + g) \\ &= P_0 (1 + g) \end{aligned}$$