

## Chapter9. Stocks and Their Valuation

\* What is a stock? Represents ownership, receive dividends

\* Characteristics of common stock & shareholder rights

- residual claims, limited liability, preemptive rights
- proxy, proxy fights

\* Stock Price vs. Intrinsic Value (p.273 – p.275)

- Price < Value => Buy/Invest, Don't buy otherwise

\* Stock Valuation

- DDVM (Discount Dividend Valuation Model) Discount all dividends and determine the sum of all dividend PVs

We cannot do this for a general situation as we need to estimate infinite many dividends.

- Thus, we use Gordon's constant growth rate model (dividends grow at the constant rate, g)

$$D_t = D_{t-1} * (1 + g)$$

Then, the PV =  $D_1 / (r_s - g)$ , where  $D_1$  = projected next dividend,  $r_s$  = discount rate, required return, or opportunity cost,  $g$  = projected dividend growth rate

Aside:  $r_s$  is typically given. However, you sometimes need to estimate  $r_s$ . 1) Use the best return from all the "competing" investment choices (opportunity cost concept), or 2) Use CAPM=SML, where  $r_s = r_f + (r_m - r_f) * \beta_s$ , where  $r_f$  = risk-free rate (e.g., T bill rate),  $r_m$  = projected market return,  $(r_m - r_f)$  = market risk premium,  $\beta_s$  = security s's systematic risk or beta risk.

Ex, if  $D_0 = \$2.00$ ,  $r_s = 8\%$ ,  $g = 5\%$ , then  $PV = 2.10 / (0.08 - 0.05) = \$70$  (note,  $D_1 = 2 * 1.05 = 2.10$   
If  $P_0 = \$66$ , you want to buy/invest as  $PV > P_0$

Aside: If the market is competitive, then  $P_0$  moves closer to PV (as a lot of people want to buy this stock and the price of stock increases with a strong demand). Eventually,  $P_0 = PV$  in the market equilibrium.

\* Alternatively, we can make an investment decision by comparing  $r_s$  (the minimum you are seeking, the required rate of return), and  $\hat{r}_s$  (security s' projected return on investment). If  $R_s > \hat{r}_s$ , then buy/invest as you may be able to make more than you are asking for. Now, the question is how to compute  $\hat{r}_s$ ? The return on investment is based on how much you invest (here,  $P_0$ ) and how much you expect to receive in return from the investment (here, all the projected dividends,  $D_1, D_2, \dots$ ). Again, we are using a  $PV = D_1 / (r_s - g)$ . The difference is, instead of  $r_s$ , which is already given or somehow you determined, you are trying to backfigure what is the special  $r_s$ , which satisfies this PV equal to  $P_0$ . In other words, we try to solve the equation,  $\$2.10 / (r_s - 0.05) = \$66$ . Let us call that special  $r_s$ ,  $\hat{r}_s = 2.10 / 66 + 0.05 = 0.0318 + 0.05 = 0.0818$  or 8.18%.

Note that  $\hat{r}_s = 8.18\% > r_s = 8\%$  (given) and you want to buy/invest in this example.

Remark 1: The two alternatives (comparing the price and (present) value or comparing the projected return and the required return) would always produce the same consistent buying/investment decision.

Remark 2:  $\hat{r}_s = D_1/P_0 + g$ , where  $D_1/P_0$  = projected dividend yield and  $g$ =projected dividend growth rate=projected capital gains yield. Note that the price of the constant growth rate stock is expected to increase at the rate of  $g\%$ , the same as the dividend growth rate.

\* Market Efficiency

\* Preferred Stock Valuation and Preferred Stock Yield (don't worry about Variable-Rate Preferred)

Recall the PV of perpetuity => PV of a Preferred Stock =  $D_p / r_p$

(Note that this is practically the same as PV of a stock,  $PV = D_1/(r_s - g)$  with  $g=0\%$ )

Examples p.291 – p.292

What is the projected return on preferred stock? Find out  $r_p$ , which produces PV equal to the current price of the preferred stock,  $P_0$ .

$\hat{r}_p = D_p / P_0$  (=projected dividend yield)

(Note: the projected capital gains yield for a preferred stock = 0% since the dividend growth rate= $g=0\%$ . The price of the preferred stock is expected to remain constant like dividends over time.)

Aside: If the market is in equilibrium, then the required rate of return,  $r$ , is equal to the projected return on investment,  $\hat{r}$ , as well as  $P_0 = PV$ .

\* Non-Constant Growth Model (Supernormal Growth Model)

In case the dividend grow rates change over time.

Ex,  $D_0 = \$2$ ,  $D_1 = 2*(1.15) = \$2.30$  (15% increase), From  $D_2$ , dividends are expected to grow at the constant rate of 6.4%. That is,  $D_2 = \$2.30*(1.064) = \$2.4472$ ,  $D_3 = 2.4472*(1.064)$ , etc. If the discount rate is 10.4%, What is the PV?

=> If you move the time period by one period, you can apply the constant growth rate model to determine the value of the stock at the end of period 1 for the future dividends from  $D_2$  onwards ( $D_2, D_3, D_4, \dots$ ). For a person who may be buying this stock one year later, the value of the stock for him could be  $FV_1 = D_2 / (r_s - g) = 2.4472 / (0.104 - 0.064) = \$61.18$ . Now, you can determine the PV of the stock based on  $D_1$  and  $FV_1$  (you may be able to sell the stock for this amount one year later after you will receive  $D_1$ )  $PV = 2.3/1.104 + 61.18/1.104 = \$57.50$

Tips for Aplia:

#3 - between the common stock and preferred stock, you may want to compare their projected total returns as the risk and return are positively related.

#4 – Once you determine the value of the stock, you can multiply it by the current number of shares outstanding to determine the current market capitalization. Now, multiply the additional shares issued by the price offered to determine how much amount the firm has received from selling new shares. Add the two amounts to determine the firm's new increased market capitalization and divide this amount by the new total number of shares outstanding (previous number of shares outstanding + additional shares issued) to determine the new value of each share. The difference between the value of the stock prior to the new shares being issued and the new value of each share is the dilution amount per share. The existing shareholders may not be happy as the new shares given to new shareholders at a price less than the market price.

The firm can avoid this conflict with existing shareholders by giving them a chance to buy first those new shares to be issued at "good" prices on the ownership pro-rata basis. Give that

the fraction of new issues issued relative to existing total number of shares, say 20%, you are entitled to increase your number of shares by that percentage amount, ie, up to 20% increase in the number of shares you will be holding. By multiplying the new number of shares you can hold by the new value of the share (you computed in the previous question), you can determine \$ value of your investment by exercising the preemptive right.

\* Corporate Valuation Model (p. 286 – p. 291)

Stock Quotations