July 3, 2019

The Principles of Financial Management - Shin, Seungho

• Stock Valuation

After FCF becomes positive, a firm/company will use it ① ~ ⑤.

Start here! → Financial Statements

↓ Find

Free Cash Flow (FCF) → How to use it?

① Pay interest expenses

② Pay down the principle on debt

③ Pay Dividends (D_t) to Shareholders :)

④ * Repurchase stocks

⑤ Buy non-operating assets (T-bills or marketable securities)

*** We focus on ③

; we first estimate the intrinsic value of stock to discount the cash flows to shareholders (dividend(s), D_t) at the rate of return required by shareholders (r_s).

* How to calculate the value of stock?

*

Like all financial assets, the value of stock is estimated by finding the present value of a stream of expected future cash flows! In other words, the value of

Stock = $Value_{stock} = \hat{P}_0$ = PV of expected future dividends

***

$$Value_{stock} = \frac{D_1}{(1+r_s)^1} + \frac{D_2}{(1+r_s)^2} + \frac{D_3}{(1+r_s)^3} + \cdots + \frac{D_\infty}{(1+r_s)^\infty} = \sum_{t=1}^{\infty} \frac{D_t}{(1+r_s)^t}$$

; DDM next page

* Cost of equity (r_s)

- firm's business risk
- market risk aversion
- market interest rate
- firm's debt / equity mix

·Ẋ· When investing in common stocks, the goal is to buy stocks that are undervalued, and avoid stocks are overvalued

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• Discounted Dividend Model (DDM);

$$\hat{P}_0 = \text{PV of expected future dividends} = \text{Value of stock} = \frac{D_1}{(1+r_s)^1} + \frac{D_2}{(1+r_s)^2} + \frac{D_3}{(1+r_s)^3} + \cdots + \frac{D_\infty}{(1+r_s)^\infty} = \sum_{t=1}^{\infty} \frac{D_t}{(1+r_s)^t}$$

When an investor purchases a share of stock, he/she typically expects to receive dividends (cash) and then, eventually, to sell the stock and to receive cash from the sale. Moreover, the price any investor receives is dependent upon the dividends the next investor(s) expects to earn, and so on for different generations of investors. Following the notion, we can calculate the value of stock, using the basic divident valuation model above.

Think about this

*** Theorically, the dividend stream extends on out forever ($D_1 \longrightarrow D_\infty$). It would not be feasible to deal with an infinite stream of dividends, but if we assume that the dividend will grow forever at a "constant rate"

***

• Constant Growth Model (as known as Gordon Model)

$$P_0 = \frac{D_1}{r_s - g}$$

before we expand/study all others, let's talk about some notations first!!

D_0 ; the most recent dividend
D_1 ; the first dividend expected
D_t ; expected dividend at the end of Year t
P_0 ; actual market price of stock today
g ; expected growth rate
r_s ; require rate of return ; cost of equity!

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repeat DDM;

$$\text{Value}_{stock} = \frac{D_0(1+g)^1}{(1+r_s)^1} + \frac{D_0(1+g)^2}{(1+r_s)^2} + \frac{D_0(1+g)^3}{(1+r_s)^3} + \cdots + \frac{D_0(1+g)^\infty}{(1+r_s)^\infty}$$

$$= D_0 \cdot \sum_{t=1}^{\infty} \frac{(1+g)^t}{(1+r_s)^t} = \left(\frac{D_0 \cdot (1+g)}{r_s - g} = \frac{D_1}{r_s - g} = \text{Constant Growth Model!} \right)$$

***

• Summary of some formulas

① Constant Growth Model (Gordon Model) = $P_0 = \frac{D_1}{r_s - g} = \frac{D_0(1+g)}{r_s - g}$

② Divident Yield = $\frac{D_1}{P_0} = \frac{P_0(1+g)}{P_0}$

③ $g = (1 - \text{Payout \%}) \times \text{ROE} = \left(\frac{\text{earnings} - \text{dividends}}{\text{earnings}} \right) \times \text{ROE}$;

(If a company/firm earns a constant rate of return on its equity and plows back a constant proportion of earnings, then your growth rate, g follows above)

④ Capital gains yield = $\frac{P_1 - P_0}{P_0} = \frac{P_1}{P_0} - 1$

ex) If Symone purchases a stock for $10,00 today and its expected price is $12 at the end of one year, then the expected capital gain would be what? $P_1 = 12$, $P_0 = 10$ so, Capital gains yield = $\frac{12-10}{10} = 0,2 = 20\%$

⑤ expected total return = $\frac{D_1}{P_0} + \frac{P_1 - P_0}{P_0} = \frac{P_1 - P_0 + D_1}{P_0}$

(expected total return on a constant growth stock)

* Let's practice some questions!!

Later, we will study the case of non-constant growth stocks (supernormal growth stocks)

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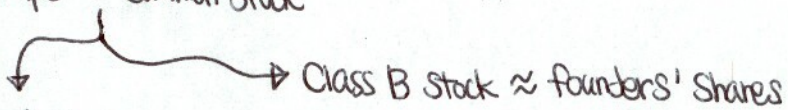
* • Stock valuation – Common Stock

① The common shareholders are the "owners" of a firm/company/"corporation". Shareholders have the right to elect its directors, who, in turn, elect the officers who manage the business. In a small business, the largest shareholder(s) usually serves as a president and chairperson of the board. Also, common shareholders have the right, called preemptive right, to purchase any additional shares sold by the firm/company/corporation.

② Type of common stock



Class A Stock
(Sold to the public and pay dividends, but no voting right/power for 5yrs)

*** ③ Common stocks are expected to provide a stream of future flows, and a stock's value is founded by the same way as the values of other financial assets – namely, as the Present Value (PV) of its expected future cash flow stream!

* • Stock Valuation – Preferred Stock

① Very similar to bonds!

② Preferred (stock) shareholders receive a *** fixed dividend and they have priority over common shareholders when it comes to dividends, but no voting rights.

③ How to calculate the value of preferred stock? or Expected return?

$$\text{Value}_{\text{preferred}} = \frac{\text{Dividend}}{\text{Return}_{\text{preferred}}}$$

ex) If preferred stock with an annual dividend of $1.25 sells for $39, its expected return would be 3.21%. $\left(39 = \frac{1.25}{r_p}\right)$

Stock Valuation

* $P_1 = P_0(1+g)$

1. If $D_1 = \$2.00$, $g = 6\%$, and $P_0 = \$40$, what are the stock's 1) expected dividend yield, 2) capital gains yield, and 3) total expected return for the coming year?

(1) expected dividend yield $= \frac{D_1}{P_0} = \frac{2}{40} = 5\%$ (2) capital gain yield $= \frac{P_1 - P_0}{P_0} = 6\%$ (3) total expected return $= \frac{P_1 - P_0 + D_1}{P_0} = 11\% = 5\% + 6\%$

2. Alex Corporation is expected to pay a dividend of \$1 at the end of the year. The required rate of return is $r_s = 11\%$. Other things held constant, what would the stock's price be if the growth rate was 5%?

$$P_0 = \frac{D_1}{r_s - g} = \frac{\$1}{11\% - 6\%} = \$16.67$$

3. Quan Inc. is expected to pay a dividend of \$1 at the end of the year. The required rate of return is $r_s = 11\%$. Other things held constant, what would the stock's price be if the growth rate was 0%?

* zero-growth stock!

$$P_0 = \frac{D_1}{r_s - g} = \frac{\$1}{11\% - 0\%} = \$9.09$$

4. Barry Corporation has a 12% ROE. Other things held constant, what would its expected growth rate be if it paid out 25% of its earnings as dividends?

$g = (1 - \text{Payout \%}) \times ROE = (1 - 25\%) \times 12\% = 9\%$ * Payout Ratio $= \frac{DIV}{NI}$

5. Scott Inc. has a 21% ROE. Other things held constant, what would its expected growth rate be if it paid out 66% of its earnings as dividends?

$g = (1 - \text{Payout \%}) \times ROE = (1 - 66\%) \times 21\% = 7.14\%$

6. A perpetual preferred stock pays a \$10 annual dividend and has a required return of 10.3%. What is its value?

$$\text{Value}_{\text{preferred}} = \frac{\text{Dividend}_{\text{preferred}}}{\text{Return}_{\text{preferred}}} = \frac{D_P}{r_P} = \frac{\$10}{10.3\%} = \$97.09$$

7. A share of UNO Co. preferred stock is selling for \$65. It pays a dividend of \$4.50 per year and has a perpetual life. the rate of return it is offering its investors is to?

$V_P = \frac{D_P}{r_P}$; $\$65 = \frac{\$4.5}{r_P}$ $r_P = 6.92\%$ * Perpetuity of Bond $= \frac{PMT}{INT}$

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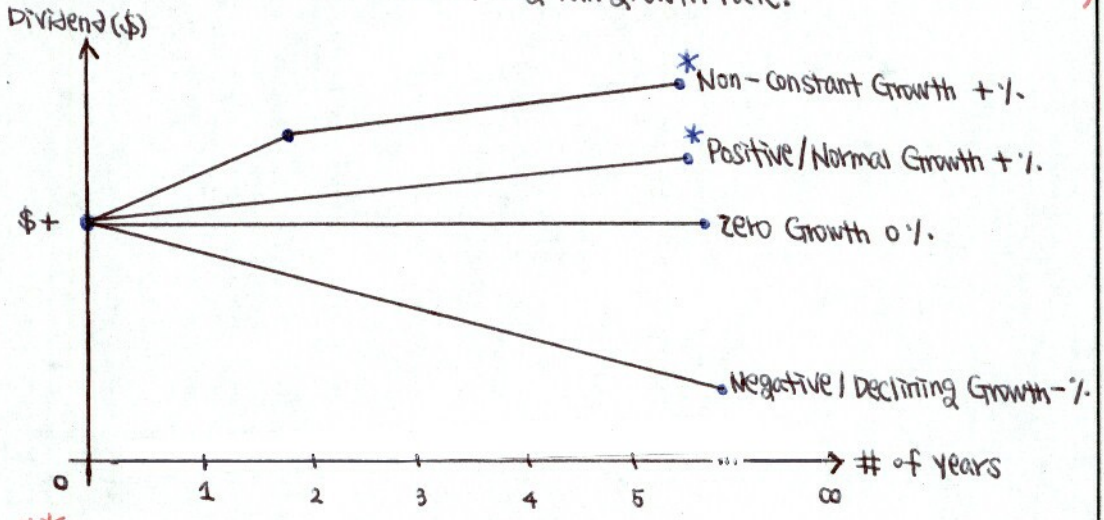
• Non-Constant Growth Stocks (≈Supernormal Growth Stocks)

In real life/world, there is no reason to assume a constant growth rate for corporations/firms/companies. Following this notion, we need to know how to estimate a short-run non-constant growth rate, then assume that after a certain point of time the firms/corporations/companies will grow at a constant rate, and estimate that constant long-run growth rate.



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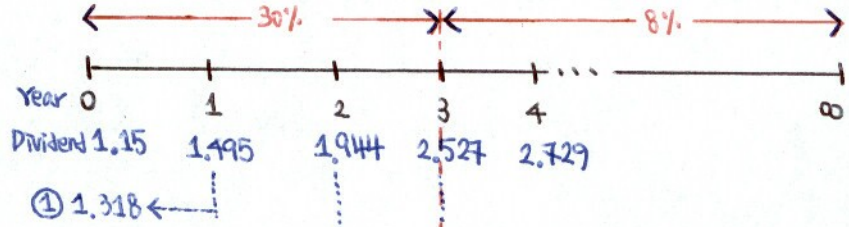
(Case 1) Emma Inc. just paid a $1.15 dividend, and it is expected to grow at 30% for the next 3 years. After 3 years the dividend is expected to grow at the rate of 8% indefinately. If the required rate of return is 13.4%, what is the stock's value today?

$D_0 = \$1.15$
$g_3 = 30\%$
$g_\infty = 8\%$
$r_s = 13.4$



① 1.318
② 1.511
③ 1.733

we can use the constant growth model since the stock becomes a constant growth stock.

0 1 ∞
2.527 2.729

$P_3 = \frac{D_4}{r_s - g} = \frac{2.729}{13.4\% - 8\%}$

④ 34.651 = 50.531 (P_3)

P_0 = ① + ② + ③ + ④

= 1.318 + 1.511 + 1.733 + 34.651 = 39.213

Non – Constant Growth Stocks (Supernormal Growth Stocks)

1. JB Healthcare Management Inc. just paid a $1.6 dividend, and it is expected to grow at 28% for the next 3 years. After 3 years the dividend is expected to grow at the rate of 7.45% indefinitely. If the required return is 17.77%, what is the stock's value today?

2. Ash Corporation just paid a $1.55 dividend, and it is expected to grow at 22% for the next 4 years. After 4 years the dividend is expected to grow at the rate of 7.4% indefinitely. If the required return is 17.4%, what is the stock's value today?