CHAPTER 4

The Value of Common Stocks

Topics Covered

- How Common Stocks Are Traded
- How Common Stocks Are Valued
- Estimating The Cost Of Equity Capital
- The Link Between Stock Price and Earnings per Share
- Valuing a Business by Discounted Cash Flow

How Common Stocks Are Traded

Primary Market - Market for the sale of new securities by corporations

Secondary Market - Market in which previously issued securities are traded among investors

Common Stock - Ownership shares in a publicly held corporation

Wall Street

How Common Stocks Are Traded

Electronic Communication Networks (ECNs) – A number of computer networks that connect traders with each other

Exchange-Traded Funds (ETFs) - Portfolios of stocks that can be bought or sold in a single trade

SPDRs (Standard & Poor's Depository Receipts or "spiders") – ETFs, which are portfolios tracking several Standard & Poor's stock market indexes

How Common Stocks Are Valued

Book Value - Net worth of the firm according to the balance sheet

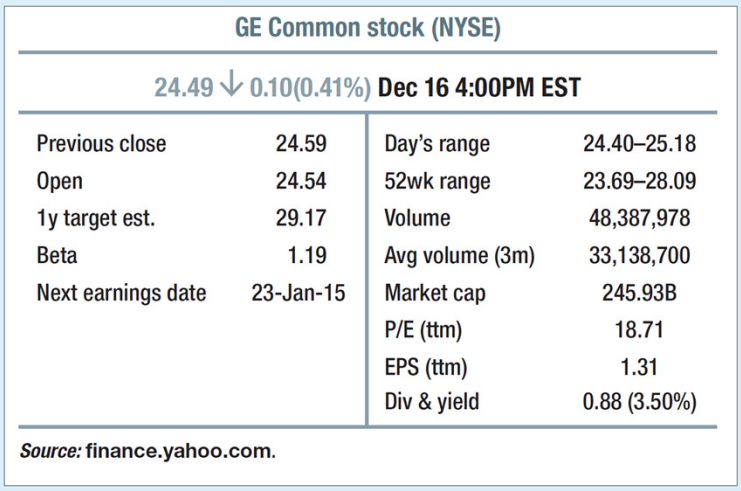
Dividend - Periodic cash distribution from the firm to the shareholders

P/E Ratio - Price per share divided by earnings per share

Market Value Balance Sheet - Financial statement that uses market value of assets and liabilities

Stock Listings

4-6



GE Common stock (NYSE)

24.49 ↓ 0.10(0.41%) Dec 16 4:00PM EST

Previous close	24.59	Day's range	24.40–25.18
Open	24.54	52wk range	23.69–28.09
1y target est.	29.17	Volume	48,387,978
Beta	1.19	Avg volume (3m)	33,138,700
Next earnings date	23-Jan-15	Market cap	245.93B
		P/E (ttm)	18.71
		EPS (ttm)	1.31
		Div & yield	0.88 (3.50%)

Source: finance.yahoo.com.

- **Bid price** – The prices at which investors are willing to buy shares.
- **Ask price** – The prices at which current shareowners are willing to sell their shares.
- **Bid-ask spread** – The difference between the bid price and the ask price.
- **Market order** – An order to buy or sell shares at the best currently available market price.
- **Limit order** – An order to buy or sell shares at a predetermined price, to be executed when the market price reaches the requested price.

How Common Stocks Are Valued

The value of any stock is the present value of its future cash flows. This reflects the DCF formula. Dividends represent the future cash flows of the firm.

$$\text{PV(stock)} = \text{PV(expected future dividends)}$$

How Common Stocks Are Valued

Expected Return - The percentage yield that an investor forecasts from a specific investment over a set period of time. Sometimes called the ***market capitalisation rate***.

$$\text{Expected return} = r = \frac{\text{Div}_1 + P_1 - P_0}{P_0}$$

How Common Stocks Are Valued

Example

If Fledgling Electronics is selling for $100 per share today and is expected to sell for $110 one year from now, what is the expected return if the dividend one year from now is forecasted to be $5.00?

$$\text{Expected return} = \frac{5 + 110 - 100}{100} = .15$$

How Common Stocks Are Valued

The price of any share of stock can be thought of as the present value of the futures cash flows. For a stock the future cash flows are dividends and the ultimate sales price of the stock.

$$\text{Price} = P_0 = \frac{\text{Div}_1 + P_1}{1 + r}$$

How Common Stocks Are Valued

Example - continued

Fledgling Electronics price can be thought of as follows.

$$\text{Price} = P_0 = \frac{5 + 110}{1.15} = 100$$

How Common Stocks Are Valued

Market capitalisation rate can be estimated using the perpetuity formula, given minor algebraic manipulation. It is also called the cost of equity capital.

$$\text{Price} = P_0 = \frac{\text{Div}_1}{r - g}$$

$$\text{Capitalisation rate} = r = \frac{\text{Div}_1}{P_0} + g$$

How Common Stocks Are Valued

Dividend Discount Model - Computation of today's stock price which states that share value equals the present value of all expected future dividends

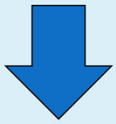
$$P_0 = \frac{\text{Div}_1}{(1+r)^1} + \frac{\text{Div}_2}{(1+r)^2} + \ldots + \frac{\text{Div}_H + P_H}{(1+r)^H}$$

H - Time horizon for your investment.

How Common Stocks Are Valued

Modified formula

$$P_0 = \frac{\text{Div}_1}{(1+r)^1} + \frac{\text{Div}_2}{(1+r)^2} + \ldots + \frac{\text{Div}_H + P_H}{(1+r)^H}$$



$$P_0 = \sum_{t=1}^{H} \frac{\text{Div}_t}{(1+r)^t} + \frac{P_H}{(1+r)^H}$$

How Common Stocks Are Valued

Example

Fledgling Electronics is forecasted to pay a $5.00 dividend at the end of year one and a $5.50 dividend at the end of year two. At the end of the second year the stock will be sold for $121. If the discount rate is 15%, what is the price of the stock?

$$PV = \frac{5.00}{(1+.15)^1} + \frac{5.50+121}{(1+.15)^2}$$

$$PV = \$100.00$$

How Common Stocks Are Valued

Another Example

Current forecasts are for XYZ Company to pay dividends of $3, $3.24, and $3.50 over the next three years, respectively. At the end of three years you anticipate selling your stock at a market price of $94.48. What is the price of the stock given a 12% expected return?

How Common Stocks Are Valued

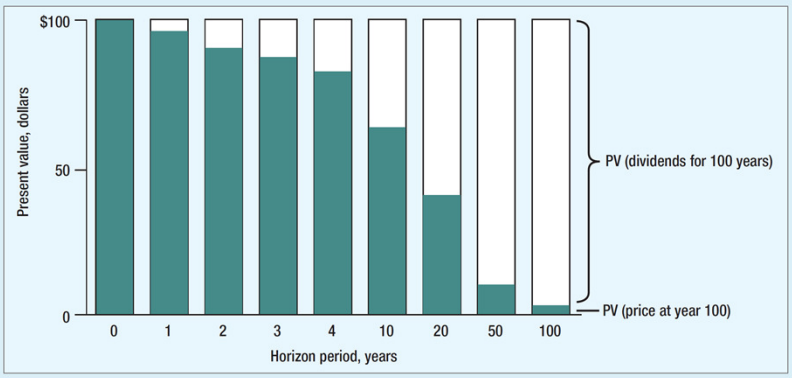
Another Example

Current forecasts are for XYZ Company to pay dividends of $3, $3.24, and $3.50 over the next three years, respectively. At the end of three years you anticipate selling your stock at a market price of $94.48. What is the price of the stock given a 12% expected return?

$$PV = \frac{3.00}{(1+.12)^1} + \frac{3.24}{(1+.12)^2} + \frac{3.50+94.48}{(1+.12)^3}$$

$$PV = \$75.00$$

How Common Stocks Are Valued



Estimating the Cost of Equity Capital

Expected Return – The expected return on a stock investment plus the expected growth in the dividends. Similar to the capitalisation rate.

$$\text{Price} = P_0 = \frac{\text{Div}_1}{r - g}$$

$$\text{Expecetd return} = r = \frac{\text{Div}_1}{P_0} + g$$

Estimating the Cost of Equity Capital

Example

Northwest Natural Gas stock was selling for $49.43 per share at the start of 2015. Dividend payments for the next year were expected to be $2.00 a share. What is the dividend yield, assuming no growth?

$$\text{Dividend yield} = r$$

$$r = \frac{2.00}{49.43}$$

$$r = .041$$

Estimating the Cost of Equity Capital

Example - continued

Northwest Natural Gas stock was selling for $49.43 per share at the start of 2015. Dividend payments for the next year were expected to be $2.00 a share. What is the dividend yield, assuming a growth rate of 7.7%?

$$\text{Expected return} = r$$

$$r = \frac{2.00}{49.43} + .077$$

$$r = .118$$

Estimating the Cost of Equity Capital

Return Measurements

$$\text{Dividend yield} = \frac{\text{Div}_1}{P_0}$$

$$\text{Restated } P_0 = \frac{\text{Div}_1}{r - g}$$

$$r = \frac{\text{Div}_1}{P_0} + g$$

$$\text{Return on equity} = \text{ROE}$$

$$\text{ROE} = \frac{\text{EPS}}{\text{book equity per share}}$$

Estimating the Cost of Equity Capital

Dividend Growth Rate can also be derived from applying the return on equity to the percentage of earnings plowed back into operations.

g = return on equity × plowback ratio

Estimating the Cost of Equity Capital

- Valuing Non-Constant Growth

$$PV = \frac{Div_1}{(1+r)^1} + \frac{Div_2}{(1+r)^2} + \ldots + \frac{Div_H}{(1+r)^H} + \frac{P_H}{(1+r)^H}$$

$$P_H = \frac{Div_{H+1}}{r-g}$$

Estimating the Cost of Equity Capital

Example

Phoenix produces dividends in three consecutive years of 0, .31, and .65, respectively. The dividend in year four is estimated to be .67 and should grow in perpetuity at 4%. Given a discount rate of 10%, what is the price of the stock?

$$PV = \frac{0}{(1+.1)^1} + \frac{.31}{(1+.1)^2} + \frac{.65}{(1+.1)^3} + \left[\frac{1}{(1+.1)^3} \times \frac{.67}{(.10-.04)}\right]$$
$$= 9.13$$

Stock Price and Earnings Per Share

- If a firm elects to pay a lower dividend, and reinvest the funds, the stock price may increase because future dividends may be higher

Payout Ratio - Fraction of earnings paid out as dividends

Plowback Ratio - Fraction of earnings retained by the firm

Stock Price and Earnings Per Share

Example

Our company forecasts to pay a $8.33 dividend next year, which represents 100% of its earnings. This will provide investors with a 15% expected return. Instead, we decide to plowback 40% of the earnings at the firm's current return on equity of 25%. What is the value of the stock before and after the plowback decision?

Stock Price and Earnings Per Share

Example

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No Growth

$$P_0 = \frac{8.33}{.15} = \$55.56$$

With Growth

$$g = .25 \times .40 = .10$$

$$P_0 = \frac{5.00}{.15 - .10} = \$100.00$$

Stock Price and Earnings Per Share

Example - continued

If the company did not plowback some earnings, the stock price would remain at $55.56. With the plowback, the price rose to $100.00.

The difference between these two numbers is called the present value of growth opportunities (PVGO).

$$\text{PVGO} = 100.00 - 55.56 = \$44.44$$

Stock Price and Earnings Per Share

Present Value of Growth Opportunities (PVGO) - Net present value of a firm's future investments.

Sustainable Growth Rate - Steady rate at which a firm can grow: plowback ratio X return on equity.

Valuing a Business

Valuing a Business or Project

The value of a business or project is usually computed as the discounted value of FCF out to a **valuation horizon (*H*).**

The **valuation horizon** is sometimes called the terminal value and is calculated like **PVGO.**

$$PV = \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \ldots + \frac{FCF_H}{(1+r)^H} + \frac{PV_H}{(1+r)^H}$$

Valuing a Business

Valuing a Business or Project

$$PV = \underbrace{\frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \ldots + \frac{FCF_H}{(1+r)^H}}_{\text{PV (free cash flows)}} + \underbrace{\frac{PV_H}{(1+r)^H}}_{\text{PV (horizon value)}}$$

Valuing a Business

Example

Given the cash flows for Concatenator Manufacturing Division, calculate the PV of near term cash flows, PV (horizon value), and the total value of the firm when r = 10% and g = 6%.

	1	2	3	4	5	6	7	8	9	10
Asset value, start of year	**10.00**	11.20	12.54	14.05	15.31	16.69	18.19	19.29	20.44	21.67
Earnings	1.20	1.34	1.51	1.69	1.84	2.00	2.18	2.31	2.45	2.60
Investment	1.20	1.34	1.51	1.26	1.38	1.50	1.09	1.16	1.23	1.30
Free cash flow (FCF)	0.00	0.00	0.00	0.42	0.46	0.50	1.09	1.16	1.23	1.30
Asset value, end of year	11.20	12.54	14.05	15.31	16.69	18.19	19.29	20.44	21.67	22.97
Return on assets (ROA)	**0.12**	**0.12**	**0.12**	**0.12**	**0.12**	**0.12**	**0.12**	**0.12**	**0.12**	**0.12**
Asset growth rate	**0.12**	**0.12**	**0.12**	**0.09**	**0.09**	**0.09**	**0.06**	**0.06**	**0.06**	**0.06**
Earnings growth rate, from previous year		0.12	0.12	0.12	0.09	0.09	0.09	0.06	0.06	0.06

Valuing a Business

Example - continued

Given the cash flows for Concatenator Manufacturing Division, calculate the PV of near term cash flows, PV (horizon value), and the total value of the firm when r = 10% and g = 6%.

$$\text{Horizon value} = \left(\frac{1.09}{.10-.06}\right) = 27.3$$

$$\text{PV(horizon value)} = \frac{27.30}{(1.10)^6} = 15.4$$

$$\text{PV(FCF)} = \frac{0}{1.1} + \frac{0}{(1.1)^2} + \frac{0}{(1.1)^3} + \frac{0.42}{(1.1)^4} + \frac{0.46}{(1.1)^5} + \frac{.50}{(1.1)^6}$$
$$= 0.90$$

Valuing a Business

Example - continued

Given the cash flows for Concatenator Manufacturing Division, calculate the PV of near term cash flows, PV (horizon value), and the total value of the firm when r = 10% and g = 6%.

$$\begin{aligned} \text{PV(business)} &= \text{PV(FCF)} + \text{PV(horizon value)} \\ &= 0.90 + 15.40 \\ &= \$16.3 \text{ million} \end{aligned}$$