

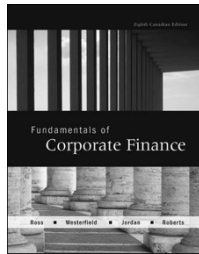
Finance for Management and Organizational Studies

MOS 2310

Chapter 8

Stock Valuation

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Stock Valuation

- Common Stock Valuation
- Common Stock Features
- Preferred Stock Valuation
- Preferred Stock Features
- Stock Market Reporting

Valuation Fundamentals

Key inputs to the valuation process include cash flows, timing, and the required return. The value of any asset is equal to the present value of all future cash flows it is expected to provide over its useful life.

Basic Valuation Model

The value of any asset is the Present Value of all future cash flows it is expected to provide over the relevant time period.

$$V_0 = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_n}{(1+r)^n}$$

V_0 = value of the asset at time zero

CF_t = cash flow expected at the end of year t

r = appropriate required rate of return (discount rate)

n = relevant time period

Common Stock Valuation Notations

D_t = the annual amount of cash dividends expected to be received at the end of the t^{th} year (where D_0 is the current dividend just paid)

r_s = the required rate of return on the stock

t = the number of time periods, or years

P_t = the market price of the stock at the end of year t (where P_0 is the price right after the receipt of the cash dividend, D_0)

g = the expected (compound) growth rate of the cash dividends; assumed to be the rate of growth in the market place

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Common Stock Features

- Shareholders' Rights
- Other Rights
 - Share proportionally in declared dividends
 - Share proportionally in remaining assets during liquidation
 - Preemptive right – first shot at new stock issue to maintain proportional ownership if desired
- Classes of stock
 - Unequal voting rights
 - Control of firm
 - Coattail provision

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Dividend Characteristics

- Dividends are not a liability of the firm until a dividend has been declared by the Board
- Consequently, a firm cannot go bankrupt for not declaring dividends
- Dividends and Taxes
 - Dividend payments are not considered a business expense and are not tax deductible
 - Dividends received by individual shareholders are partially sheltered by the dividend tax credit
 - Dividends received by corporate shareholders are not taxed
 - This prevents double taxation of dividends

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Two ways to Profit: Dividends and Capital Gains

$$\text{Expected Return} = r = \underbrace{\frac{Div_1}{P_0}}_{\text{Dividend Yield}} + \underbrace{\frac{P_1 - P_0}{P_0}}_{\text{Capital Gains Yield}}$$

Where:

Div_1 = expected cash dividend over the next year

P_0 = current price of the stock (time zero)

P_1 = expected price of the stock at "time 1"

Dividend Discount Model (DDM)

The value of a share of stock equals the present value of all expected future dividends paid until the horizon date, H, plus the present value of the anticipated sales price of the stock, P_H

$$P_0 = \frac{Div_1}{(1+r)^1} + \frac{Div_2}{(1+r)^2} + \dots + \frac{Div_H + P_H}{(1+r)^H}$$

In words, the value of a stock is the present value of the dividends it will pay over the investor's horizon plus the present value of the expected stock price at the end of that horizon

Dividend Discount Model

Hold for 1 year:

$$P_0 = \frac{Div_1}{(1+r)^1} + \frac{P_1}{(1+r)^1}$$

Hold for 2 years:

$$P_0 = \frac{Div_1}{(1+r)^1} + \frac{Div_2}{(1+r)^2} + \frac{P_2}{(1+r)^2}$$

Hold for 3 years:

$$P_0 = \frac{Div_1}{(1+r)^1} + \frac{Div_2}{(1+r)^2} + \frac{Div_3}{(1+r)^3} + \frac{P_3}{(1+r)^3}$$

Zero Growth

The PV of a constant perpetuity is calculated by dividing the cash payment (the dividend) by the discount rate:

$$P_0 = \frac{D}{r}$$

← Next Dividend
← Required rate of return

Where $D_1 = D_2 = D_3 = D = \text{constant}$

Forecasting Issues

DDM requires a forecast of dividends for every year into the future (bit of a problem)

The easiest simplification assumes a no-growth or zero growth perpetuity that works for no-growth common shares

Another simplification is to forecast dividends growing at a steady rate (Constant-growth dividend discount model or *Gordon Growth Model*)

Constant-growth Dividend Discount Model

The PV of a growing perpetuity is calculated by dividing the cash payment (the dividend) by the discount rate minus the constant growth rate:

$$P_t = \frac{D_t \times (1 + g)}{r - g}$$

Where:

P_t = Price of the stock (time t)

D_t = dividend

r = discount rate

g = dividend growth (constant) rate

Determining Common Stock Values with Constant Growth

Common stock value is the constant dividend cash flow divided by the required return adjusted for expected growth

Assumptions:

1. Infinite holding period
2. $r > g$
3. Constant growth in dividends

This model only yields meaningful outcomes when r_s is greater than the long-term growth rate, g

Expected Rates of Return

Expected Rate of Return revisited. If the market is efficient, the value of the common share (V_0) is equal to market price (P_0)

- Rearranging the DGM gives us the expected rate of return:

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

$\left[\frac{3}{60} \right]$
 Dividend Yield
 5%

 $\left[\quad \quad \quad \right]$
 Growth Rate
 + 7%

12% =

Variable (or Nonconstant) Growth in Cash Dividends

Employ four steps to solve problems involving nonconstant growth in cash dividends

Step 1:

- Determine the cash dividends until the series reverts to constant growth to infinity or no growth

Step 2:

- Find the PV of the dividends expected during each year of the initial growth period (discount using the required rate of return), then sum the PVs

Variable Growth in Cash Dividends

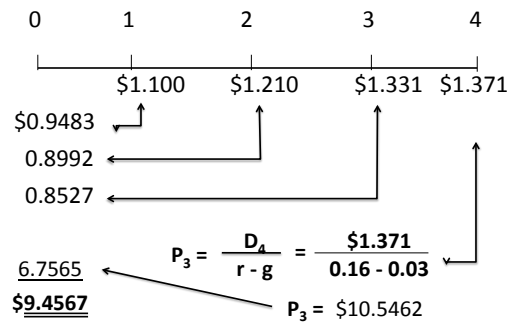
Step 3:

- Determine the first year's dividend after the growth rate changes to constant growth to infinity or no growth
- Determine the value of the stock as of the end of the nonconstant (or rapid) growth period by applying the constant growth model

Step 4:

- Add the PV of the initial dividend stream (step 2) to the PV of the shares at the end of the initial growth period (step 3)

Time Line for Nonconstant Dividend Series



Regardless of the Investment Horizon, the Stock Value will be the Same



As long as the investors are consistent in their assessment of the prospects of the firm, they will arrive at the same present value

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Stock Market Reporting

- Stock market quotations are published in the newspapers and are also available on-line (usually with 15-minute delays during trading hours)
- In Canada, large cap stocks trade on the TSX
- Quotes and corporate information on stocks that trade on the TSX can be found at the exchange's website

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Preferred Shares Valuation

- Preferred shares have two cash flows:
 - Dividends, and
 - The amount received when preferred shares are sold.
- If preferred shares are left unsold, they act like a perpetuity

$$P_0 = \frac{D_1}{r_f}$$

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Preferred Stock Features

- Dividends
 - Most preferreds have a stated dividend that must be paid before common dividends can be paid
 - Dividends are not a liability of the firm and preferred dividends can be deferred indefinitely
 - Most preferred dividends are cumulative – any missed preferred dividends have to be paid before common dividends can be paid
- Preferred stock generally does not carry voting rights

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