

# VALUING STOCKS & MULTIPLE VALUATION

## Required Reading

- **Chapter 7**, “*Valuing Stocks*” from J. Berk et al., Fundamentals of Corporate Finance, Second Canadian Edition.

# Common Stocks

## An ownership share in a corporation

- we also say an **equity security**
- you usually get voting rights as a fractional owner
- the general rule is “*one share one vote.*”
- you’re represented by a Board of Governors
- you’re entitled to the firm’s wealth (receive **dividends**)

## What’s the difference between public & private equity?

- Public means that it is publicly traded on an Exchange
- Private means that it is not publicly traded

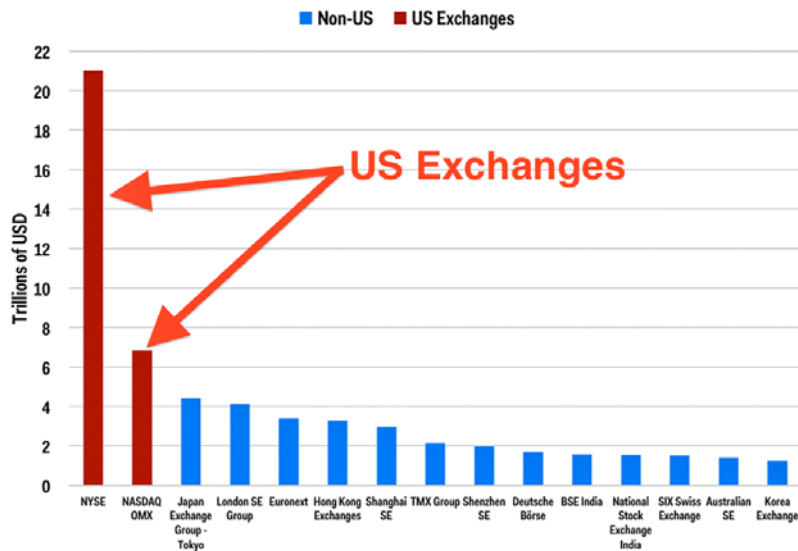
# Common Stocks

- **Residual Claim:** Common stockholders have claim to firm’s cash flows and assets *after* all obligations to creditors and preferred stockholders are met.
- **Limited Liability:** Shareholders may lose their investment, but no more.

## Other rights:

- The right to share proportionally in **dividends** paid.
- The right to vote on some matters of great importance, such as mergers.
- *Preemptive Right:* Stockholders may have the right to share proportionally in any new stock sold.

Market Capitalizations of the 15 Largest Stock Exchanges (Oct 2014)



## Payout Policy

### How can firms return funds to their shareholders?

1. **Share Repurchases:** When firms uses cash to buy back its own equity.
2. **Cash Dividends:** Payments made out of the firm's earnings to its shareholders.

#### Characteristics

- The payment of dividends and the decision to repurchase shares is at the discretion of the board of directors.
- Unless the dividend is declared by the board of directors, it is not a liability of the corporation.
- Dividends and share repurchases are not tax deductible for corporations
- Regular Dividends vs. Special (one time) Dividends

## Preferred Stock

**Preferred stock:** Stock with preference over common shares in payment of dividends and in liquidation.

- Normally with a fixed dividend rate, often without voting rights.

*Two types:*

- **Cumulative preferred stock:** Preferred stock for which all missed preferred dividends must be paid before any common dividends may be paid.
- **Non-cumulative preferred stock:** Preferred stock for which missed preferred dividends do not accumulate. Only the current dividend is owed before common dividends may be paid.

## Debt vs. Equity

	<u>Debt</u>	<u>Equity</u>
Ownership of the Corporation	NO	YES
Tax deductible for corporations	YES (Interest Paid)	NO (Dividends Paid)
Can cause bankruptcy?	YES	NO
Seniority	Debt is senior to Equity	

**Common Stocks:** Represents a share of ownership in a corporation, which confers the rights to any common dividends as well as voting rights



where

$P_0$ : Current stock price

$P_1$  Expected stock price in period 1

$Div_1$ : Expected dividend per share paid in period 1

## Stock Price and Returns

**Stock Prices:**

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

where  $r_E$  is the required return on the equity. That is, the expected return of other investments available in the market with equivalent risk.

**Stock Returns:**

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

### Example

A share of Dot.com will pay a dividend per share of \$100 next year. The expected price today of the share in a year is \$1,000 and the required rate on return is 20%. What is the current price of the share?

**Answer**

0                      1      Year  
|—————|  
\$100+\$1,000

$$P_0 = \frac{100 + 1,000}{1 + 0.2} = \$916.66 \quad ; \quad \text{Dividend Yield} = \frac{100}{916.66} = 10.9\%$$

$$\text{Capital Gains Yield} = \frac{1,000 - 916.66}{916.66} = 9.1\%$$

## Equity Valuation Models

**Alternative methods to value the firm's equity:**

I. The Dividend-Discount Model

II. The Discounted FCF Model

III. Valuation by Multiples

## Dividend-Discount Model

$$P_0 = \frac{Div_1 + P_1}{1 + r_E} = \frac{Div_1}{(1 + r_E)} + \frac{Div_2 + P_2}{(1 + r_E)^2}$$

$$P_1 = \frac{Div_2 + P_2}{1 + r_E}$$

In general if we keep substituting  $P_t = \frac{Div_{t+1} + P_{t+1}}{1 + r_E}$  using we get:

$$P_0 = \frac{Div_1}{(1 + r_E)} + \frac{Div_2}{(1 + r_E)^2} + \frac{Div_3}{(1 + r_E)^3} + \dots = \sum_{t=1}^{\infty} \frac{Div_t}{(1 + r_E)^t}$$

## Dividend-Discount Model

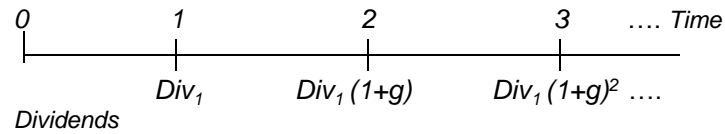
**“The price of a stock today is equal to the present value of all the future dividends”**

$$P_0 = \sum_{t=1}^{\infty} \frac{Div_t}{(1 + r_E)^t}$$

*How difficult is to find the price of the stock?*

- Dividends are not known in advance
- The life of the investment (the corporation) is uncertain
- Which is the “right” rate of return  $r_E$  that the market requires?

## Constant Dividend Growth Model



Since the stream of dividends is a growing perpetuity the stock price can be written as:

$$P_0 = \frac{Div_1}{r_E - g}$$

## Constant Dividend Growth Model

Rearranging  $P_0 = \frac{Div_1}{r_E - g}$  we obtain:

$$r_E = \underbrace{\frac{Div_1}{P_0}}_{\text{Dividend Yield}} + \underbrace{g}_{\text{Capital Gains Yield}}$$

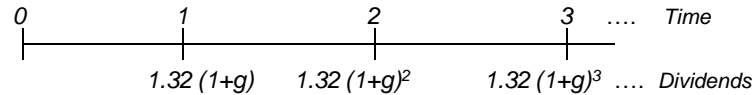
Hence, in the constant dividend growth model the capital gains yield is equal to the dividend growth rate.



### Example

Dot.com's stock price is \$38.15 and has just paid a dividend per share of \$1.32. Assume that the required market return is 12%. What is the investors' estimate of Dot.com's dividend growth rate if they apply the constant growth model? What is the dividend yield?

### Answer



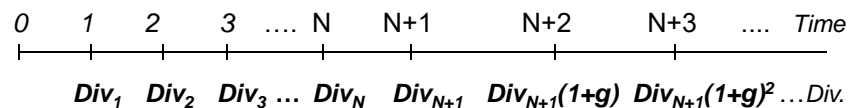
- Expected dividend growth rate:

$$P_0 = \frac{Div_1}{r_E - g} \Rightarrow 38.15 = \frac{1.32 \times (1+g)}{0.12 - g} \Rightarrow g = 8.25\%$$

- Dividend Yield =  $r_E - g = 12\% - 8.25\% = 3.75\%$

## Dividend Growth Model

The dividend growth model can have many different variations, for instance, in the case of a constant long term growth  $g$  after  $N$  periods the stock price is:

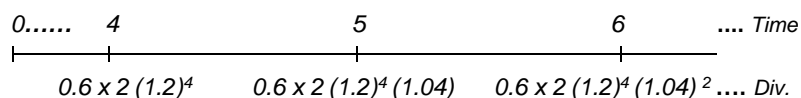


$$P_0 = \frac{Div_1}{1 + r_E} + \frac{Div_2}{(1 + r_E)^2} + \dots + \frac{Div_N}{(1 + r_E)^N} + \frac{1}{(1 + r_E)^N} \left( \frac{Div_{N+1}}{r_E - g} \right)$$

### Example

Small Fry, Inc. has just invested a potato chip that tastes like a french fry. Given the market response for this product Small Fry is reinvesting all of its earnings to expand operations. Earnings were \$2 per share this year and are expected to grow at a 20% per year for four years. In year 4, Small Fry will cut investment and start paying 60% of its earnings as dividends and its growth will slow down to a long-run rate of 4%. If Small Fry's cost of equity is 8% what is the value of a share today?

### Answer



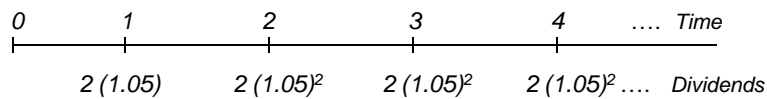
Notice that the stream of dividends is a growing perpetuity with the first dividend of  $0.6 \times 2 (1.2)^4$  occurring in year 4 and with a constant dividend growth of 4% every year thereafter:

$$P_0 = \frac{1}{(1.08)^3} \frac{0.6 \times 2 \times (1.2)^4}{0.08 - 0.04} = \$49.42$$

### Example

Dot.com has just paid a \$2 dividend. It is expected that the dividends will grow at 5% during the next two periods and remain constant thereafter. The required market rate is 10%. What should the stock price be?

### Answer



$$P_0 = \frac{2 \cdot (1.05)}{1.1} + \frac{2 \cdot (1.05)^2}{(1.1)^2} + \frac{1}{(1.1)^2} \frac{2 \cdot (1.05)^2}{0.1} = 21.95$$

## Dividends and Growth

What determines the rate of growth of a firm's dividends?

$$Div_t = EPS_t \times \text{Dividend Payout Ratio}_t$$

where

- **Earnings:** Total profit net of depreciation, interest, and taxes.
- **$EPS_t$  (Earnings Per Share)** =  $Earnings_t / \text{Number of Shares}_t$
- **Dividend Payout Ratio<sub>t</sub>:** Fraction of the earnings that firms payout as dividends in period  $t$ .

*Hence, if a firm has a constant dividend payout ratio, the growth in dividends per share,  $Div_t$ , is determined by the growth in  $EPS_t$ .*

# Dividends and Growth

## What determines the rate of growth of a firm's earnings?

If all increases in future earnings result *exclusively* from new investments financed with retained earnings then:

$$\text{Growth EPS Rate} = \text{Retention Rate} \times \text{Return on New Investment}$$

where

**Retention Rate:** Fraction of the earnings that the firm retains, (i.e., that it does not payout as dividends).

*Hence, the growth in  $EPS_t$  is determined by (i) the retention rate and (ii) the return on the new investments.*

## Example

Crane Sporting Goods has a equity cost of capital of 10%. Crane expects to have earnings per share of \$6 in the coming year. Calculate Crane's stock price if:

- 1) Crane pays all its future earnings as dividends.
- 2) Crane pays 75% of all its future earnings as dividends and with the retained earnings opens new stores with a expected return of 12%.
- 3) Crane pays 75% of all its future earnings as dividends and with the retained earnings opens new stores with a expected return of 8%.

### Answer

**1) 100% Payout Ratio (= 0% Retention Rate):**

$g = \text{Retention Rate} \times \text{Return on New Investment} = 0\%$

$$P_0 = \frac{Div_1}{r_E - g} = \frac{6}{0.10 - 0.00} = \$60$$

**2) 75% Payout Ratio and 12% return on new investments:**

$$g = (1 - 0.75) \times 12\% = 3\% ; P_0 = \frac{Div_1}{r_E - g} = \frac{0.75 \times 6}{0.10 - 0.03} = \$64.3 > \$60$$

**3) 75% Payout Ratio and 8% return on new investments:**

$$g = (1 - 0.75) \times 8\% = 2\% ; P_0 = \frac{Div_1}{r_E - g} = \frac{0.75 \times 6}{0.10 - 0.02} = \$56.3 < \$60$$

## The Total Payout Model

The Total Payout Model extends the Dividend-Discount model to consider shares repurchases:

$$P_0 = \frac{PV(\text{Future Total Dividends and Repurchases})}{\text{Number of Shares Outstanding}_0}$$

**Note:** The numerator is the current value of the firm's equity (which divided by the number of shares gives the price per share,  $P_0$ .)

### Example

Titan Industries has 217 million shares outstanding and expects earnings at the end of this year of \$860 million. Titan plans to pay out 50% of its total earnings, paying 30% as a dividend and using 20% to repurchase shares. If Titan's earnings are expected to grow by 7.5 %, and this payout ratios remain constant, determine Titan's share price assuming an equity cost of capital of 10%.

### Answer

-The current value of Titan's equity is the present value of all the future dividends and share repurchases, which is a growing perpetuity:

$$PV(\text{Future Dividends \& Repurchases}) = \frac{0.5 \times \$860}{0.10 - 0.075} = \$17,200 \text{ M}$$

-Hence the current share price is:

$$P_0 = \frac{\text{Equity Value}}{\text{Number of Shares}_0} = \frac{\$17,200 \text{ M}}{217 \text{ M}} = \$79.3 \text{ per share}$$

## Equity Valuation Models

### Alternative methods to value the firm's equity:

I. The Dividend-Discout Model

II. The Discounted FCF Model

III. Valuation by Multiples

## The Discounted Free Cash Flow (DCF) Model

$$\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} - \text{Cash}$$

Note: Cash: It refers to excess cash (beyond net working capital).

Valuing the Enterprise:

- ✓ To estimate a firm's enterprise value at time 0,  $V_0$ , we compute the present value of the firm's FCF to pay all investor:

$$V_0 = PV(\text{Future Free Cash Flow of Firm})$$

- ✓ Where the free cash flow:

$$\begin{aligned} \text{Free Cash Flow} = & EBIT \times (1 - \text{Tax Rate}) + \text{Depreciation} \\ & - \text{Capital Expenditures} - \text{Increases in Net Working Capital} \end{aligned}$$

## The Discounted Free Cash Flow (DCF) Model

- ✓ Given the enterprise value, to solve for the value of equity and divide by the total number of shares outstanding.

$$P_0 = \frac{V_0 + \text{Cash}_0 - \text{Debt}_0}{\text{Shares Outstanding}}$$

## Estimating the Firm's Enterprise Value

Since we are discounting the cash flows to all investors, we use the **weighted average cost of capital (WACC)**, denoted by  $r_{wacc}$

Forecast free cash flow up to some horizon (say time  $n$ ), together with a terminal value of the enterprise at time  $n$ ,  $V_n$  :



$$V_0 = \sum_{t=1}^n \frac{FCF_t}{(1+r_{WACC})^t} + \frac{V_n}{(1+r_{WACC})^n}$$

## Methods to Estimate the Terminal Value

- **Liquidation Value:** In some cases the firm will cease operations at foreseeable point in time in the future and sell the assets. Then the terminal value is expected market value of those assets (i.e., the salvage value).
- **Multiple Valuation:** Value the terminal value of the firm by applying a multiple to the firm's expected earnings or revenues in that year. This method has all the caveats of relative valuation. (We will see that next.)
- **Stable Growth Model:** (NEXT SLIDE)



## Stable Growth Model

- This model assumes that the cash flows, beyond the terminal year  $n$ , will grow at a constant rate forever. In this case the terminal value is a growing perpetuity:

$$V_n = \frac{FCF_{n+1}}{r_{wacc} - g_{FCF}}$$

where  $g_{FCF}$  is the “stable” growth rate of the FCF

- In general the perpetual growth rate cannot exceed the growth rate of the economy in which a firm operates

### Question

Why discounting a firm's free cash flows we obtain the value of the enterprise value (that is, the value of debt plus the value of equity - excess cash)?

### Answer

All the firm's FCF plus the excess cash go either to debt-holders (*i.e.*, interest and debt repayments) or to shareholders (*i.e.*, dividends and share repurchases).

## Example

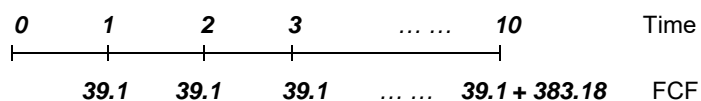
ATT currently has annual revenues of \$ 835 million, cost of goods sold of \$ 600 million, depreciation of \$ 100 million, and interest expense of \$ 40 million. Annual investment to replace depreciated machinery is \$ 150 million. This state of affairs is expected to continue for ten years. After 10 years FCF will start to decrease at a rate of 2% per year. If ATT cost of capital is 8%, the value of its debt is \$150 million, and there are 1.5 million shares outstanding, calculate ATT's current share price. Assume a marginal corporate tax rate of 34%.

## Solution

- *First*, estimate the FCF for the first ten years and the TV (which is a growing perpetuity):

$$\text{FCF} = (835 - 600 - 100) (1 - 0.34) + 100 - 150 = \$39.1 \text{ M}$$

$$\text{TV}_{10} = \frac{39.1 \cdot (1 - 0.02)}{0.08 - (-0.02)} = \$383.18 \text{ M}$$



### Solution (cont)

- Second, calculate the value of ATT's firm value:

$$\text{Enterprise Value} = \frac{39.1}{0.08} \left( 1 - \frac{1}{1.08^{10}} \right) + \frac{383.18}{1.08^{10}} = \$439.84\text{M}$$

- Third calculate the equity value:

$$\text{Equity} = \text{Enterprise Value} + \text{Cash} - \text{Debt} = 439.847 + 0 - 150 = \$289.84 \text{ M}$$

- Finally, calculate the price per share:

$$\text{Share Price} = \frac{289.48}{1.5} = \$193.23 \text{ per share}$$

### Example

Nike had sales of \$19.2 billion in 2009. Suppose you expect its sales to grow at a rate of 10% in 2010, but then slow by 1% per year to the long-run growth rate that is characteristic of the apparel industry—5%—by 2015. Based on Nike's past profitability and investment needs, you expect *EBIT* to be 10% of sales, increases in net working capital requirements to be 10% of any increase in sales, and capital expenditures to equal depreciation expenses.

If Nike has \$2.3 billion in cash, \$32 million in debt, 486 million shares outstanding, a tax rate of 24%, and a weighted average cost of capital of 10%, what is your estimate of the value of Nike's stock in early 2010?

## Solution

### 1- Estimating the FCF up to 2015

1	Year	2009	2010	2011	2012	2013	2014	2015
2	FCF Forecast (\$ million)							
3	Sales	19,200.0	21,120.0	23,020.8	24,862.5	26,602.8	28,199.0	29,609.0
4	Growth versus Prior Year		10.0%	9.0%	8.0%	7.0%	6.0%	5.0%
5	EBIT (10% of sales)		2,112.0	2,302.1	2,486.2	2,660.3	2,819.9	2,960.9
6	Less: Income Tax (24%)		506.9	552.5	596.7	638.5	676.8	710.6
7	Plus: Depreciation		—	—	—	—	—	—
8	Less: Capital Expenditures		—	—	—	—	—	—
9	Less: Increase in NWC (10% ΔSales)		192.0	190.1	184.2	174.0	159.6	141.0
10	Free Cash Flow		1,413.1	1,559.5	1,705.3	1,847.8	1,983.5	2,109.3

**Note** Because capital expenditures are expected to equal depreciation, lines 7 and 8 in the spreadsheet cancel out hence we do not need to explicitly forecast them.

## Solution

2- Given our assumption of constant 5% growth in free cash flows after 2015 and a weighted average cost of capital of 10%, we can compute a terminal enterprise value:

$$V_{2015} = \left( \frac{1 + g_{FCF}}{r_{wacc} - g_{FCF}} \right) \times FCF_{2015} = \left( \frac{1.05}{0.10 - 0.05} \right) \times 2,109.3 = \$44,295 \text{ million}$$

3- Nike's current enterprise value is the present value of its free cash flows plus the firm's terminal value:

$$V_0 = \frac{1,413.1}{1.10} + \frac{1,559.5}{1.10^2} + \frac{1,705.4}{1.10^3} + \frac{1,847.8}{1.10^4} + \frac{1,983.5}{1.10^5} + \frac{2,109.3}{1.10^6} + \frac{44,295.0}{1.10^6} = \$32,542.4 \text{ million}$$

4- We can now estimate the value of a share of Nike's stock:

$$P_0 = \frac{32,542.4 + 2,300 - 32}{486} = \$71.63$$

## Equity Valuation Models

Alternative methods to value the firm's equity:

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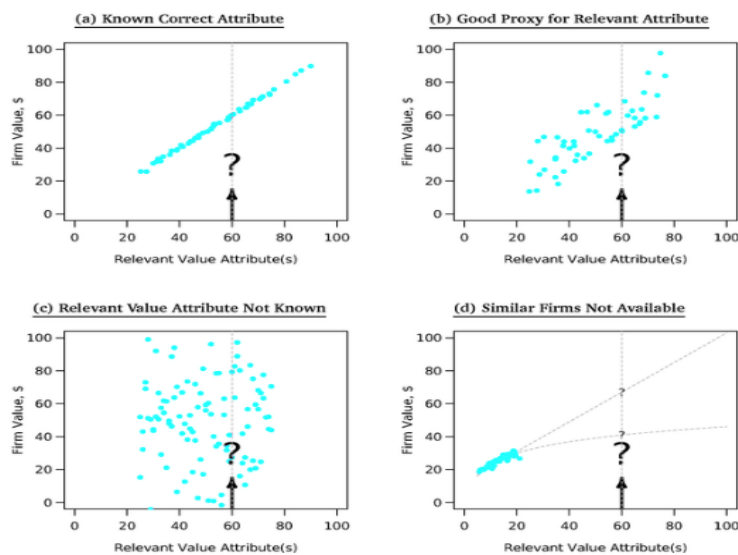
## Valuation by Multiples

- Popular way of valuation: Highly used in Real Estate and M&A
- Basic Insight: “An asset should sell for \$20 if it has twice the annual cash flow as a very similar asset that recently sold for \$10”
- The most important (and difficult) things are choosing the right multiples and selecting truly comparable firms.

# Choosing Comparable Firms

- Comparable Firms have to be “similar” but we need a large enough sample to average out firms’ idiosyncrasies.
- Eliminate firms that have suffered “abnormal” events (*i.e.*, takeovers).
- Criteria for the selection of comparable firms: Industry Classifications (*i.e.*, ≠ products), Technology (*i.e.*, ≠ in cost structures), Clientele (*i.e.*, ≠ product qualities, ≠ markups), Size (*i.e.*, economies of scale) and Leverage (*i.e.*, equity with different financial risk).

## When Can Multiples Help with Valuation?



## Price / Earnings Ratio (P/E)

- The most popular version of multiple valuation is the P/E ratio, which is equal to the share price divided by the earnings per share:
- Type of P/E ratios:
  - Trailing P/E =  $\frac{P_0}{EPS_0}$
  - Forward P/E =  $\frac{P_0}{EPS_1}$
- To estimate the value of a firm's share price multiply its earnings per share by the average P/E of the comparable firms.

### Example

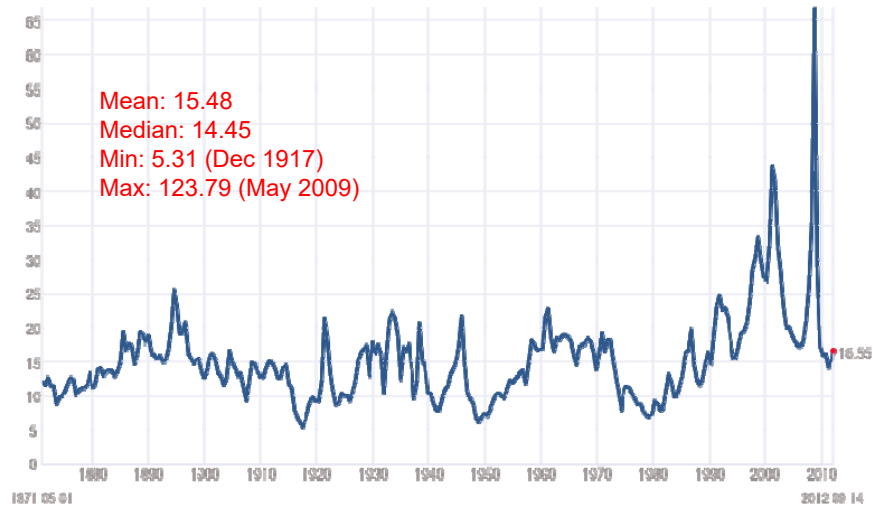
Furniture manufacturer Herman Miller Inc., has earnings per share of \$1.38. If the average P/E of comparable furniture stocks is 21.3, estimate Herman Miller's share price.

### Solution

$$P_0 = EPS \times (P/E) = \$1.38 \times 21.3 = \$29.39$$

**Note:** If Miller's price per share is \$29.39 and it has earnings per share of \$1.38 Miller's P/E ratio would be 21.3 (just the same as the comparable firms).

## S&P 500 P/E Ratio



## Interpreting the P/E Ratio

- If dividends grow at a rate  $g$  forever, then, using the dividend model:

$$\text{Forward P/E} = \frac{P_0}{EPS_1} = \frac{1}{EPS_1} \frac{Div_1}{r_E - g}$$

$$P_0 = \frac{Div_1}{r_E - g}$$

- Since  $Div_1 / EPS_1$  is the payout ratio:

$$\text{Forward P/E} = \frac{\text{Dividend Payout Ratio}}{r_E - g}$$



## Interpreting the P/E Ratio

$$\text{Forward P/E} = \frac{\text{Dividend Payout Ratio}}{r_E - g}$$

The P/E ratio depends on:

1. Equity cost of capital (i.e., the equity's risk) **(-)**
2. Growth Rate **(+)**
3. Dividend Payout Ratio **(+)**

### Example

Firm A has a long term growth rate of 4% , a required return on equity of 8% and a dividend payout ratio of 50% of earnings. Calculate the stocks forward P/E ratio.

### Solution

$$\text{P/E} = \frac{\text{Payout Ratio}}{r_E - g} = \frac{0.5}{0.08 - 0.04} = 12.5$$

**TABLE 7.2** Stock prices and Multipliers for the Footwear Industry (excluding Nike), July 2013

Name	Market Capitalization (\$ million)	Enterprise Value (\$ million)	P/E	Price/Book	Enterprise Value/Sales	Enterprise Value/EBITDA
Nike, Inc.	55,970	54,023	23.29	5.07	2.03	15.71
Adidas AG	23,105	23,317	32.33	3.06	1.20	11.88
Puma AG	4,330	4,085	70.56	1.96	0.96	9.34
Wolverine World Wide	2,910	3,981	37.6	4.13	1.22	9.28
Steven Madden, Ltd.	2,320	2,140	18.4	3.68	1.74	10.70
Deckers Outdoor Corp.	1,990	1,923	16.74	2.67	1.36	8.73
Crocs, Inc.	1,470	1,240	11.46	2.4	1.10	6.74
Skechers U.S.A.	1,340	1,213	67.41	1.54	0.78	18.16
Weyco Group	301	325	16.53	1.71	1.11	9.69
R. G. Barry Corp.	197	174	14.92	2.31	1.19	6.44
Rocky Brands, Inc.	113	132	12.46	0.89	0.58	6.61
<b>Average</b>			<b>29.84</b>	<b>2.44</b>	<b>1.12</b>	<b>9.76</b>
<b>Maximum</b>			136%	70%	55%	86%
<b>Minimum</b>			-62%	-63%	-48%	-34%

All Ratios as of July 2013

## Enterprise Value to EBITDA Multiple

- Enterprise market value to EBITDA ratio:

$$\rightarrow \text{Current EV to EBITDA ratio} = \frac{EV_0}{EBITDA_0}$$

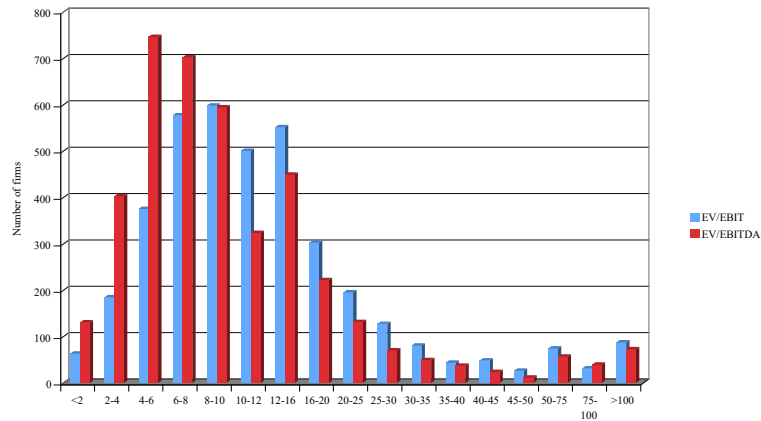
$$\rightarrow \text{Forward EV to EBITDA ratio} = \frac{EV_0}{EBITDA_1}$$

- Multiply the EBITDA of the firm by the comparables' average enterprise value to EBITDA ratio to estimate the firm's enterprise value:

$$EV_0^{\text{Firm}} = EBITDA_0^{\text{Firm}} \times \text{Avg} \left[ \frac{EV_0}{EBITDA_0} \right]$$

$$EV_0^{\text{Firm}} = EBITDA_1^{\text{Firm}} \times \text{Avg} \left[ \frac{EV_0}{EBITDA_1} \right]$$

## Enterprise Value/EBITDA Distribution - US



## Enterprise Value/EBITDA Across Industries

INDUSTRY	# of Firms	EV/EBITDA	EV/EBIT
Entertainment	77	8.03	10.67
Natural Gas Utility	22	8.06	11.36
Computers/Peripherals	87	8.11	9.85
Chemical (Diversified)	31	8.95	12.28
Machinery	100	9.08	12.41
Med Supp Non-Invasive	146	9.23	11.34
Drug	279	9.35	13.02
Food Processing	112	9.54	11.93
Internet	186	17.06	21.41
Healthcare Information	25	20.77	31.55
E-Commerce	57	22.08	31.60
<b>Total Market</b>	<b>5891</b>	<b>7.37</b>	<b>9.70</b>

Jan-2012

## Interpreting Firm Value to EBIT Multiple

Assuming constant growth rate  $g$ , the enterprise value of the firm EV is:

$$V_0 = \frac{FCF_1}{r_{wacc} - g_{FCF}} \Rightarrow \frac{V_0}{EBITDA_1} = \frac{FCF_1/EBITDA_1}{r_{wacc} - g_{FCF}}$$

So we dividing and multiplying by  $EBITDA_1$  we get:

$$V_0 = \frac{FCF_1}{r_{wacc} - g_{FCF}} \Rightarrow \frac{V_0}{EBITDA_1} = \frac{FCF_1/EBITDA_1}{r_{wacc} - g_{FCF}}$$

### Example

Westcoast Port, Inc., is an ocean transport company with *EBITDA* of \$50 million, cash of \$20 million, debt of \$100 million, and 10 million shares outstanding. The ocean transport industry as a whole has an average *EV/EBITDA* ratio of 8.5. What is one estimate of Westcoast's enterprise value? What is a corresponding estimate of its stock price?

### Solution

- 1- Enterprise Value = \$50 M  $\times$  8.5 = \$425 M
- 2- Equity Value = \$425 M - \$100 M + \$20 M = \$345 M
- 3- Share price = \$345 M  $\div$  10 M = \$34.50

## Other Multiples

- **Cash-flow-based Value multiples:**
  - Market Value of Firm / Earnings
  - Market Value of Firm / FCF
- **Cash-flow-based Price multiples:**
  - Price per share / EBITDA per share
  - Price per share / FCF per share
- **Asset-based multiples:**
  - Market Value of Firm / Book Value of Assets
  - Market Value of Equity / Book Value of Equity
- **Multiples of operational data:** When financial data is sparse, compute non-financial multiples:
  - Market Value of Firm / Web site hits
  - Market Value of Firm / Number of subscribers

## Multiple Valuation: Pros and Cons

### Pros:

- Incorporates a lot of information in a simple way.
- Embodies market consensus about discount rate and growth rate.
- Can provide discipline in valuation process by ensuring that your valuation is in line with other valuations.

### Cons:

- Implicitly assumes all companies are alike in growth rates, cost of capital, and business composition. But it is hard to find true comparables.
- Accounting differences, particularly with earnings and equity-based measures and book values can vary across firms depending on age.

## Information, Competition, and Stock Prices

### Information in Stock Prices

- For a publicly traded firm, market price should already provide very accurate information regarding the true value of its shares.
- A valuation model is best applied to tell us something about future cash flows or cost of capital, based on current stock price.
  - Only in the relatively rare case in which we have some superior information that other investors lack would it make sense to second-guess the stock price.

## Information, Competition, and Stock Prices

**Efficient Markets Hypothesis:** Implies that securities will be fairly priced, based on their future cash flows, given all information that is available to investors.

- Public, Easily Available Information:
  - Information available to all investors includes information in news reports, financial statements, corporate press releases, or other public data sources.
- Private or Difficult-to-Interpret Information

The **Efficient Markets Hypothesis states** that securities with equivalent risk should have the same expected return.

- The efficient markets hypothesis is, therefore, incomplete without a definition of “equivalent risk.”

## Individual Biases and Trading

### Excessive Trading and Overconfidence

- Trading is expensive because of commissions and the difference between the bid and ask
- Given the difficulty of finding over- and under-valued stocks, you might expect individual investors to trade conservatively.
- However, a study of the trading behaviour of individual investors at a discount brokerage found individual investors trade very actively.

### Hanging on to Losers (the Disposition Effect)

- Investors tend to hold on to stocks that have lost value and sell stocks that have risen in value
- May reflect a reluctance to admit a mistake by taking the loss.

## Individual Biases and Trading

### Investor Attention, Mood, and Experience

- *Individual investors have limited time and attention*
  - More likely to buy stocks that have been in the news, advertised more, had very high trading volume, or recently had extreme (high or low) returns.
- *Investor mood affects investment behavior*
  - Annualized market returns at the location of the stock exchange is higher on sunny days than on cloudy days.
- *Investors appear to put too much weight on their own experience rather than considering historical evidence*
  - People who grow up and live during a time of high stock returns are more likely to invest in stocks.