



Bachelor of Economics
THAMMASAT UNIVERSITY

FN 211 Financial Markets

Class 3: Equity Valuation

Equity Valuation:

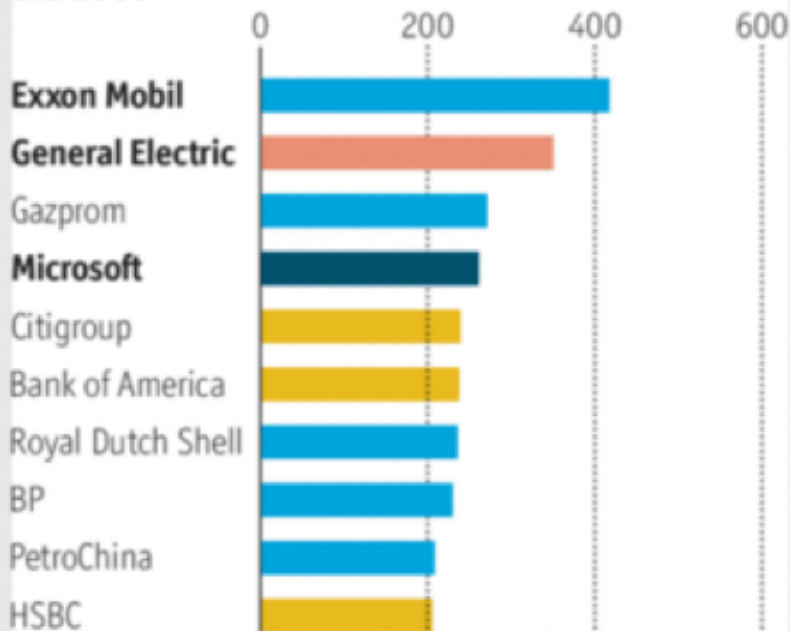
World's largest companies

A virtually new world

World, largest listed companies by market capitalisation, \$bn

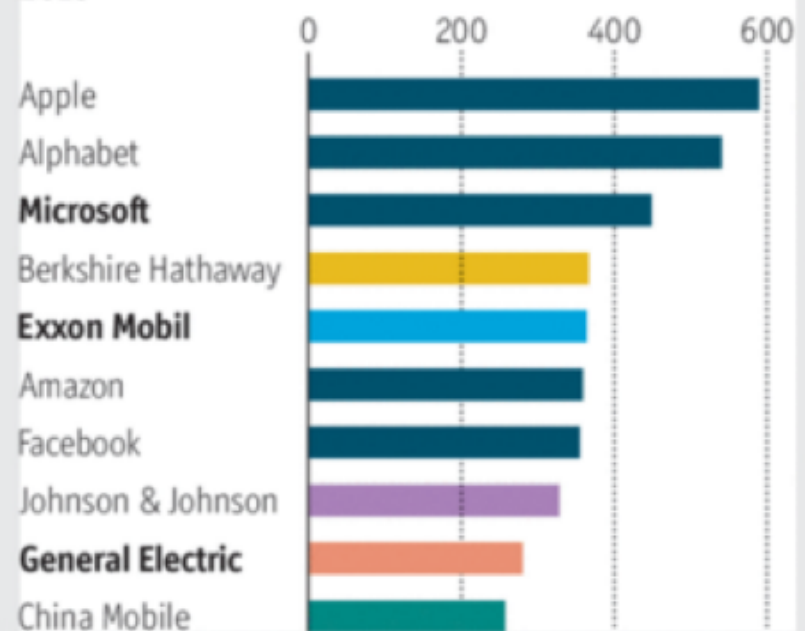
Sector: Energy Financials Health care Industrials IT Telecoms

End 2006



Source: Bloomberg

2016*



*At August 24th 2016

Economist.com

Equity Valuation: The Basics

Estimated Value vs. Market Price

- **Estimated value > market price => undervalued**
- Estimated value = market price => fairly valued
- Estimated value < market price => overvalued

Equity Valuation Models

1. **Present Value** – PV of expected future cash flows
 - *DDM, FCFE*
2. **Multiplier Model** – intrinsic value based on multiple of some fundamental variable:
 - *P/E, P/S, EV/EBITDA*
3. **Asset-based Valuation** – based on estimated value of assets - liabilities
 - *Book Value*

Equity Valuation:

Dividend Discount Model (DDM)

DDM

- Intrinsic value of a share is the PV of expected future dividends/cash flows.
- The issuing company is assumed to be a going concern.

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_\infty}{(1+k)^\infty}$$
$$= \sum_{t=1}^n \frac{D_t}{(1+k)^t}$$

$$P_0 = \frac{FCFE_1}{(1+k)} + \frac{FCFE_2}{(1+k)^2} + \dots + \frac{FCFE_\infty}{(1+k)^\infty}$$
$$= \sum_{t=1}^n \frac{FCFE_t}{(1+k)^t}$$

where:

P_0 = value of common stock

D_t = dividend during time period t

k = required rate of return on stock

FCFE = Free Cash Flow for Equity = CFO – FCInv + Net borrowing

Equity Valuation:

Dividend Discount Model (DDM)

The N-Period Model

- If the stock is held for only N period, e.g. 2 years, and a sale at the end of year 2 would imply:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{SP_2}{(1+k)^2}$$

- The expected selling price, SP_2 , of stock at the end of Year 2 is crucial, which is in fact the present value of future expected dividends

Example - A stock just paid \$10 dividend. dividend will grow 10% each year. The stock is expected to be sold at \$150 at the end of year 2. $k = 20\%$.

Equity Valuation: Gordon Growth Model

- Given the constant growth rate, the earlier formula can be reduced to:

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

$$\frac{P_0}{E_1} = \frac{D_1 / E_1}{k - g} = \frac{\text{Payout}}{k - g}$$

Assumptions of DDM:

- Dividends grow at a constant rate
- The constant growth rate will continue for an infinite period
- The required rate of return (k) is greater than the infinite growth rate (g)

Example: Apple Inc. has just paid a dividend of \$10. An analyst expects that dividends will rise at 5% a year forever. The required rate of return on the stock is 23%. Calculate the intrinsic value of Apple Inc.

Equity Valuation:

Multistage Dividend Discount Model

- **Information:** A stock has just paid \$10 dividend.
 - Dividends will grow at 30% for year 1 and year 2, 15% for years 3 to 5, and then 5% from year 6.
- **Solution:**
 - The present value of the 1st stage supernormal growth:

$$V_1 = + \frac{\$10(1 + .3)}{(1 + .1)^1} + \frac{\$10(1 + .3)^2}{(1 + .1)^2} = \$25.8$$

- The present value of the 2nd stage supernormal growth:

$$V_2 = \frac{\$10(1 + .3)^2(1 + .15)}{(1 + .1)^3} + \frac{\$10(1 + .3)^2(1 + .15)^2}{(1 + .1)^4} + \frac{\$10(1 + .3)^2(1 + .15)^3}{(1 + .1)^5} = \$45.9$$

Equity Valuation:

Multistage Dividend Discount Model

- The terminal value of constant growth at the end of the 5th year:

$$\text{Terminal Value} = \frac{\$10(1 + .3)^2(1 + .15)^3(1 + 0.05)}{10\% - 5\%} = \$539.8$$

- The present value of constant growth:

$$V = \frac{\$539.8}{(1 + 0.1)^5} = \$335.3$$

- The total value of the stock: $\$25.8 + \$45.9 + \$335.3 = \407

Equity Valuation: Multiplier Models

- **Price to earnings (P/E)**

- Better use forward P/E (predict future earnings) than trailing P/E
- can only be used to value stocks with positive EPS
- EPS can be manipulated

Example: Dora has estimated that earnings per share (EPS) of Apple Inc. for the year 2017 will be \$45. Based on her research, an average P/E ratio of stocks in the same industry is 12 times. Based on the information provided, the intrinsic value of Apple Inc. is closest to ...

Equity Valuation: Multiplier Models

Valuation Using the Price-Earnings Ratio

Problem

Suppose 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 a value for Herman Miller using the P/E as a valuation multiple. What are the assumptions underlying this estimate?

Equity Valuation: Multiplier Models

Solution

We estimate a share price for Herman Miller by multiplying its EPS by the P/E of comparable firms. Thus, $P_0 = \$1.38 \times 21.3 = \29.39 . This estimate assumes that Herman Miller will have similar future risk, payout rates, and growth rates to comparable firms in the industry.

Valuation Multiples (cont'd)

- Other Multiples
 - Multiple of sales
 - Price to book value of equity per share
 - Enterprise value per subscriber
 - Used in cable TV industry

Limitations of Multiples

- When valuing a firm using multiples, there is no clear guidance about how to adjust for differences in expected future growth rates, risk, or differences in accounting policies.
- Comparables only provide information regarding the value of a firm relative to other firms in the comparison set.
 - Using multiples will not help us determine if an entire industry is overvalued,

Comparison with Discounted Cash Flow Methods

- Discounted cash flows methods have the advantage that they can incorporate specific information about the firm's cost of capital or future growth.
- The discounted cash flow methods have the potential to be more accurate than the use of a valuation multiple.

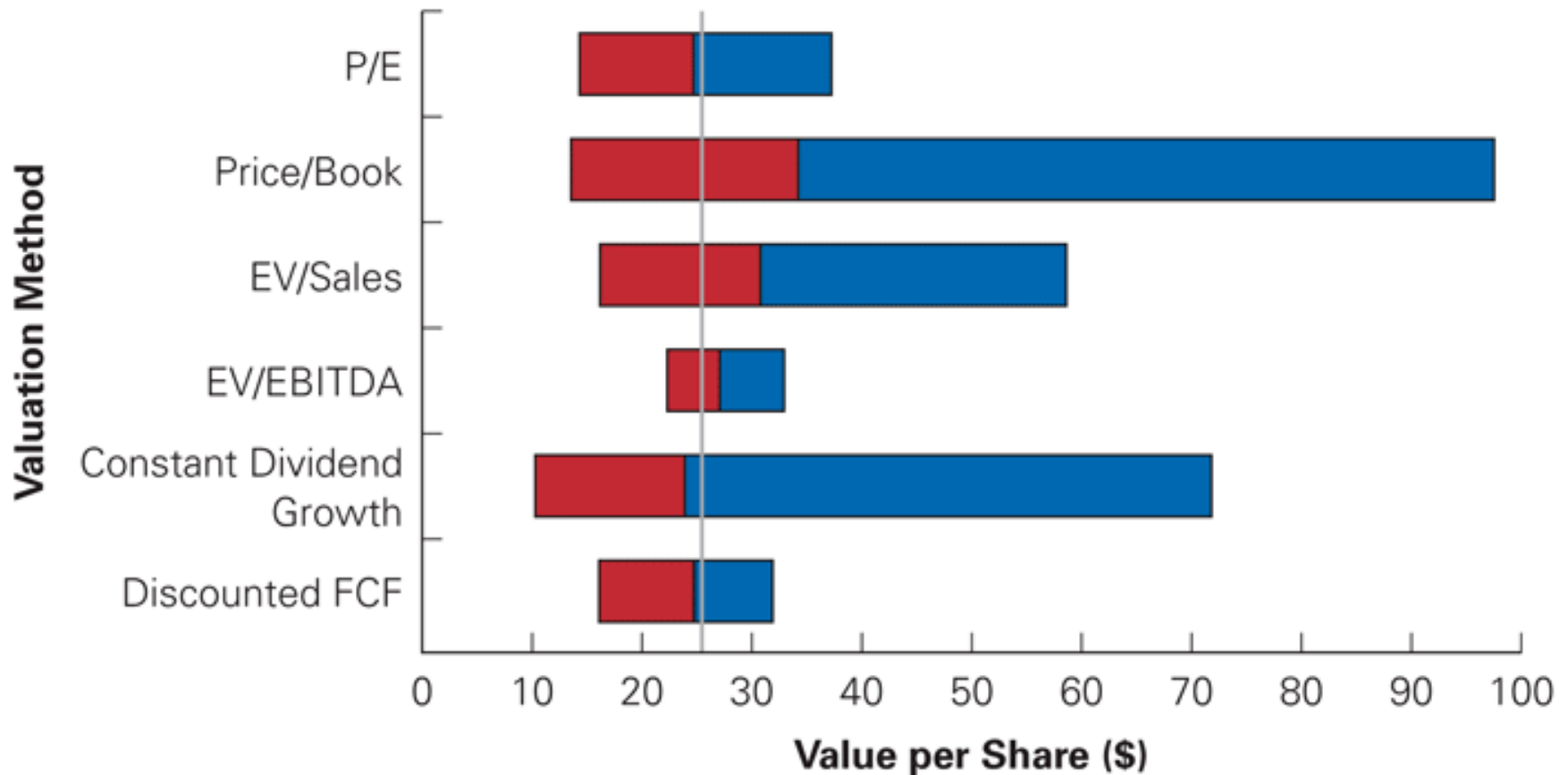
Stock Prices and Multiples for the Footwear Industry, January 2006

Ticker	Name	Stock Price (\$)	Market Capitalization (\$ millions)	Enterprise Value (\$ millions)	P/E	Price/ Book	Enterprise Value/ Sales	Enterprise Value/ EBITDA
KCP	Kenneth Cole Productions	26.75	562	465	16.21	2.22	0.90	8.36
NKE	NIKE, Inc.	84.20	21,830	20,518	16.64	3.59	1.43	8.75
PMMAY	Puma AG	312.05	5,088	4,593	14.99	5.02	2.19	9.02
RBK	Reebok International	58.72	3,514	3,451	14.91	2.41	0.90	8.58
WWW	Wolverine World Wide	22.10	1,257	1,253	17.42	2.71	1.20	9.53
BWS	Brown Shoe Company	43.36	800	1,019	22.62	1.91	0.47	9.09
SKX	Skechers U.S.A.	17.09	683	614	17.63	2.02	0.62	6.88
SRR	Stride Rite Corp.	13.70	497	524	20.72	1.87	0.89	9.28
DECK	Deckers Outdoor Corp.	30.05	373	367	13.32	2.29	1.48	7.44
WEYS	Weyco Group	19.90	230	226	11.97	1.75	1.06	6.66
RCKY	Rocky Shoes & Boots	19.96	106	232	8.66	1.12	0.92	7.55
DFZ	R.G. Barry Corp.	6.83	68	92	9.20	8.11	0.87	10.75
BOOT	LaCrosse Footwear	10.40	62	75	12.09	1.28	0.76	8.30
Average (excl. KCP)					15.01	2.84	1.06	8.49
Max (relative to Ave.)					+51%	+186%	+106%	+27%
Min (relative to Ave.)					-42%	-61%	-56%	-22%

Stock Valuation Techniques: The Final Word

- No single technique provides a final answer regarding a stock's true value. All approaches require assumptions or forecasts that are too uncertain to provide a definitive assessment of the firm's value.
- Most real-world practitioners use a combination of these approaches and gain confidence if the results are consistent across a variety of methods.

Range of Valuation Methods for KCP Stock Using Alternative Valuation Methods



Equity Valuation: Practice Questions

- 1) Micro Corp. just paid dividends of \$2 per share. Assume that over the next three years dividends will grow as follows, 5% next year, 15% in year two, and 25% in year 3. After that growth is expected to level off to a constant growth rate of 10% per year. The required rate of return is 15%. Calculate the intrinsic value using the multistage model.

Equity Valuation: Practice Questions

- 2) Corporation paid a dividend yesterday for \$1.50. They expect to pay dividends annually at a constant 6% annual growth rate indefinitely. If the required rate of return on this investment is 12%, what is the current value of this common stock?

Equity Valuation: Practice Questions

- 3) Tayco Corporation has just paid dividends of \$3 per share. The earnings per share for the company was \$4. If you believe that the appropriate discount rate is 15% and the long term growth rate in dividends is 6%, and earnings is 6%, the firm's P/E ratio is

Equity Valuation: Practice Questions

- 4) Consider a firm that has just paid a dividend of \$2. An analyst expects dividends to grow at a rate of 8% per year for the next five years. After that dividends are expected to grow at a normal rate of 5% per year. Assume that the appropriate discount rate is 7%.

Equity Valuation: Practice Questions

5) During the period 1960-2007, earnings of the S&P500 Index companies have increased at an average rate of 8.18% per year and the dividends paid have increase at an average rate of 5.9%
Assume that

- Dividends will continue to grow at 1960-2007 rate
- The required return on the index is 8%
- Companies in S&P 500 Index collectively paid \$27.73 billion in dividends in 2007

Estimate aggregate value of S&P500 Index component companies at the beginning of 2008 using Gordon growth model

Equity Valuation: Practice Questions

6) The US coal mining company is currently profitable and is expected to pay a dividend of \$4 per share next year. The company has suspended exploration, however, and because its current mature operations exhaust the existing mines, you expect that the dividends paid by the company will decline forever at 8%. The required return on this stock is 11%. Using the DDM, estimate the value of the stock.

Equity Valuation: Practice Questions

- 7) You are analyzing the stock of Ansell Limited, a health care company, as of 2018. The stock price is \$9.74. The company's dividend per share for the year end 2017 was \$0.27. You expect the dividend to increase by 10% for the next 3 years and then increase by 8% per year forever. You estimate the required return on equity of Ansell Limited to be 12%
- a) Estimate the value of Ansell using a two-stage dividend discount model.
 - b) Judge whether Ansell is undervalued, fairly valued, or overvalued