

FINC 430 TA Session 6

Regressions review and Multiples Solutions

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Regressions Review

See Excel Tutorial

Only need to know `SLOPE(YVAR,XVAR)`

Can use `LINEST` for more details

Building Up Different Multiples: FCF

Fewest Assumptions: Free Cash Flow Multiple

Start with Gordon Growth Model, using FCF instead of dividends, b/c FCF goes to whole firm while dividends only go to equity holders

$$Asset\ Value_0 = \frac{FCF_1}{r - g} = \frac{(1 + g)FCF_0}{r - g}$$

$$\frac{Asset\ Value_0}{FCF_0} = \frac{(1 + g)}{r - g}$$

Building Up Different Multiples: NOPAT

More Assumptions: AV/NOPAT

Start with Gordon Growth, multiply both sides by $1/\text{NOPAT}$

$$\frac{1}{\text{NOPAT}} \text{Asset Value}_0 = \frac{(1+g)FCF_0}{r-g} \frac{1}{\text{NOPAT}}$$

$$\frac{AV_0}{\text{NOPAT}} = \frac{(1+g)}{r-g} \frac{FCF_0}{\text{NOPAT}}$$

Building Up Different Multiples: NOPAT

$$\frac{AV_0}{NOPAT} = \frac{(1 + g)}{r - g} \frac{FCF_0}{NOPAT}$$

Recall that $\frac{FCF_0}{NOPAT}$ is a measure of capital efficiency

Building Up Different Multiples: Sales

Start with the NOPAT multiple

$$\frac{AV_0}{NOPAT} = \frac{(1+g)}{r-g} \frac{FCF_0}{NOPAT}$$

And multiply both sides by NOPAT/SALES

$$\frac{NOPAT}{SALES} \frac{AV_0}{NOPAT} = \frac{(1+g)}{r-g} \frac{FCF_0}{NOPAT} \frac{NOPAT}{SALES}$$

Simplify on the next slide

Building Up Different Multiples: Sales

$$\frac{AV_0}{SALES} = \frac{(1 + g)}{r - g} \frac{FCF_0}{NOPAT} \frac{NOPAT}{SALES}$$

Recall that $\frac{NOPAT}{SALES}$ is a measure of profitability

Multiples Summary

For whatever multiple you are using, make sure the quantities on the right-hand-side of the equation are comparable!

$$\begin{aligned}\frac{A_0}{Sales_0} &= \frac{A_0}{FCF_0} \left(\frac{FCF_0}{NOPAT_0} \right) \left(\frac{NOPAT_0}{Sales_0} \right) \\ &= \left(\frac{1+g}{r-g} \right) (Capital\ efficiency)(Profit\ margin)\end{aligned}$$

Multiples Summary II

FCF Multiple: Similar r and g

NOPAT Multiple: Similar r and g + capital efficiency

Sales Multiple: Similar r and g + capital efficiency + profitability

Question 1

When using a free cash flow multiple (e.g., Enterprise Value/Free Cash Flow), all companies included in the analysis should (implicitly) be comparable along the following dimensions:

- A) Riskiness, as measured by the equity beta
- B) Riskiness, as measured by the opportunity cost of capital
- C) Long-term growth rate or growth opportunities
- D) Dividend payout ratio
- E) Capital efficiency ratio
- F) Profit margin
- G) Tax rate

Strategy

- Write out the formula
- Recall from before, start with GG model:
 - $Asset\ Value_0 = \frac{FCF_1}{r-g}$
 - Divide both sides by FCF_0 to get a free cash-flow multiple
 - Because we are assuming a constant growth rate,
 $FCF_1 = FCF_0(1 + g)$

B and C are correct answers

B) Riskiness, as measured by the opportunity cost of capital

C) Long-term growth rate or growth opportunities

$$\text{Asset Value}_0 = \frac{FCF_1}{r - g} = \frac{(1 + g)FCF_0}{r - g}$$

$$\frac{\text{Asset Value}_0}{FCF_0} = \frac{(1 + g)}{r - g}$$

So, r and g have to be the same

Question 2 (9-24 in the Textbook)

You notice that PepsiCo (PEP) has a stock price of \$72.62 and EPS of \$3.80. Its competitor, the Coca-Cola Company (KO), has EPS of \$1.89. Estimate the value of a share of Coca-Cola stock using only this data.

Strategy

- Determine multiple
 - Here we are only given information on price and earnings
- Apply multiple

PepsiCo P/E = $\$72.62 / \$3.80 = 19.1x$.

Apply to Coca-Cola:

$\$1.89 \times 19.1 = \36.10 .

Aside: why use eps? Price is relevant to equity holders, eps is available to equity holders

Compare to ev, which equity + net debt

Question 3 (9-25 in the Textbook)

Suppose that in January 2006, Kenneth Cole Productions had EPS of \$1.65 and a book value of equity of \$12.05 per share.

- (a) Using the average P/E multiple in Table 9.1, estimate KCP's share price.
- (b) What range of share prices do you estimate based on the highest and lowest P/E multiples in Table 9.1?
- (c) Using the average price to book value multiple in Table 9.1, estimate KCP's share price.
- (d) What range of share prices do you estimate based on the highest and lowest price to book value multiples in Table 9.1?

Table 9-1**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
NKE	Nike	84.2	21,830	20,518	16.64	3.59	1.43	8.75
PMMA	Puma AG	312.05	5,088	4,593	14.99	5.02	2.19	9.02
RBK	Reebok	58.72	3,514	3,451	14.91	2.41	0.9	8.58
WWW	Wolverine World Wide	22.1	1,257	1,253	17.42	2.71	1.2	9.53
BWS	Brown Shoe	43.36	800	1,019	22.62	1.91	0.47	9.09
SKX	Sketchers	17.09	683	614	17.63	2.02	0.62	6.88
SRR	Stride Rite	13.7	497	524	20.72	1.87	0.89	9.28
DECK	Deckers Outdoor	30.05	373	367	13.32	2.29	1.48	7.44
WEYS	Weco Group	19.9	230	226	11.97	1.75	1.06	6.66
RCKY	Tocky Shoes & Boots	19.96	106	232	8.66	1.12	0.92	7.55
DFZ	R.G. Barry Corp.	6.83	68	92	9.2	8.11	0.87	10.75
BOOT	LaCross Footwear	10.4	62	75	12.09	1.28	0.76	8.3

Computing Summary Stats

Table 9-1

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BOOT	LaCross Footwear	10.4	62	75	12.09	1.28	0.76	8.3
Min					8.66	1.12	0.47	6.66
Max					22.62	8.11	2.19	10.75
Average					15.01	2.84	1.07	8.49

(a) Share price = Average P/E $\times$ KCP EPS = $15.01 \times \$1.65 = \24.77

(b) Minimum = $8.66 \times \$1.65 = \14.29 ,
Maximum = $22.62 \times \$1.65 = \37.32

(c) Avg p/b is 2.84:
 $2.84 \times \$12.05 = \34.22

(d) Low: $1.12 \times \$12.05 = \13.50 ,
High: $8.11 \times \$12.05 = \97.73

Question 4 (9-26 in the Textbook)

Uses same data as Question 3

Suppose that in January 2006, Kenneth Cole Productions had sales of \$518 million, EBITDA of \$55.6 million, excess cash of \$100 million, \$3 million of debt, and 21 million shares outstanding.

- (a) Using the average enterprise value to sales multiple in Table 9.1, estimate KCP's share price.
- (b) What range of share prices do you estimate based on the highest and lowest enterprise value to sales multiples in Table 9.1?
- (c) Using the average enterprise value to EBITDA multiple in Table 9.1, estimate KCP's share price.
- (d) What range of share prices do you estimate based on the highest and lowest enterprise value to EBITDA multiples in Table 9.1?

Strategy

- Compute averages
- Compute EV using multiple
- Compute Equity value using EV formula
- Divide by number of shares

Computing Summary Stats

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Min					8.66	1.12	0.47	6.66
Max					22.62	8.11	2.19	10.75
Average					15.01	2.84	1.07	8.49

(a) Estimated enterprise value for KCP = Average EV/Sales $\times$ KCP Sales = $1.07 \times \$518$ million = \$554 million [Note: This is rounded]

Equity Value = EV – Debt + Cash = $\$554 - 3 + 100 = \651 million.

Share price = Equity Value / Shares = $\$651 / 21 = \31

(b) \$16.21 – \$58.64

(c) Estimated enterprise value for KCP = Average EV/EBITDA $\times$ KCP EBITDA = $8.49 \times \$55.6$ million = \$472 million.

Share Price = $(\$472 - 3 + 100) / 21 = \27.10

(d) \$22.25 – \$33.08

Question 5 (9-27 in the Textbook)

In addition to footwear, Kenneth Cole Productions designs and sells handbags, apparel, and other accessories. You decide, therefore, to consider comparables for KCP outside the footwear industry.

(a) Suppose that Fossil, Inc., has an enterprise value to EBITDA multiple of 9.73 and a P/E multiple of 18.4. What share price would you estimate for KCP using each of these multiples, based on the data for KCP in Problems 3 and 4?

(b) Suppose that Tommy Hilfiger Corporation has an enterprise value to EBITDA multiple of 7.19 and a P/E multiple of 17.2. What share price would you estimate for KCP using each of these multiples, based on the data for KCP in Problems 25 and 26?

(a) Using EV/EBITDA:

$EV = 55.6(\text{ebitda}) \times 9.73 \text{ (multiple)} = 541 \text{ million,}$

$\text{Equity Value} = EV - \text{Debt} + \text{Cash}$

$P = (541 + 100 - 3) / 21 \text{ (shares)} = \30.38

Using P/E:

$P = 1.65 \text{ (eps)} \times 18.4 = \30.36

(b) Using EV/EBITDA:

$EV = 55.6 \times 7.19 = 400 \text{ million,}$

$P = (400 + 100 - 3) / 21 = \23.67

Using P/E:

$P = 1.65 \times 17.2 = \$28.38$