What tax rate?

- The tax rate that you should use in computing the after-tax operating income should be
    a. The effective tax rate in the financial statements (taxes paid/ Taxable income)
    b. The tax rate based upon taxes paid and EBIT (taxes paid/EBIT)
    c. The marginal tax rate for the country in which the company operates
    d. The weighted average marginal tax rate across the countries in which the company operates
    e. None of the above
    f. Any of the above, as long as you compute your after-tax cost of debt using the same tax rate

The Right Tax Rate to Use

- The choice really is between the effective and the marginal tax rate. In doing projections, it is far safer to use the marginal tax rate since the effective tax rate is really a reflection of the difference between the accounting and the tax books.
- By using the marginal tax rate, we tend to understate the after-tax operating income in the earlier years, but the after-tax tax operating income is more accurate in later years
- If you choose to use the effective tax rate, adjust the tax rate towards the marginal tax rate over time.
  - While an argument can be made for using a weighted average marginal tax rate, it is safest to use the marginal tax rate of the country

A Tax Rate for a Money Losing Firm

- Assume that you are trying to estimate the after-tax operating income for a firm with $ 1 billion in net operating losses carried forward. This firm is expected to have operating income of $ 500 million each year for the next 3 years, and the marginal tax rate on income for all firms that make money is 40%. Estimate the after-tax operating income each year for the next 3 years.

	Year 1	Year 2	Year 3
EBIT	500	500	500
Taxes			
EBIT (1-t)			
Tax rate			

Net Capital Expenditures

- Net capital expenditures represent the difference between capital expenditures and depreciation. Depreciation is a cash inflow that pays for some or a lot (or sometimes all of) the capital expenditures.
- In general, the net capital expenditures will be a function of how fast a firm is growing or expecting to grow. High growth firms will have much higher net capital expenditures than low growth firms.
- Assumptions about net capital expenditures can therefore never be made independently of assumptions about growth in the future.

Capital expenditures should include

- Research and development expenses, once they have been re-categorized as capital expenses. The adjusted net cap ex will be
  - Adjusted Net Capital Expenditures = Net Capital Expenditures + Current year's R&D expenses - Amortization of Research Asset
- Acquisitions of other firms, since these are like capital expenditures. The adjusted net cap ex will be
  - Adjusted Net Cap Ex = Net Capital Expenditures + Acquisitions of other firms - Amortization of such acquisitions
- Two caveats:

  1. Most firms do not do acquisitions every year. Hence, a normalized measure of acquisitions (looking at an average over time) should be used

  2. The best place to find acquisitions is in the statement of cash flows, usually categorized under other investment activities

Cisco's Acquisitions: 1999

Acquired	Method of Acquisition	Price Paid
GeoTel	Pooling	$1,344
Fibex	Pooling	$318
Sentient	Pooling	$103
American Internet	Purchase	$58
Summa Four	Purchase	$129
Clarity Wireless	Purchase	$153
Selsius Systems	Purchase	$134
PipeLinks	Purchase	$118
Amteva Tech	Purchase	$159
		$2,516

Cisco's Net Capital Expenditures in 1999

Cap Expenditures (from statement of CF)	= \$ 584 mil
- Depreciation (from statement of CF)	= \$ 486 mil
Net Cap Ex (from statement of CF)	= \$ 98 mil
+ R & D expense	= \$ 1,594 mil
- Amortization of R&D	= \$ 485 mil
+ Acquisitions	= \$ 2,516 mil
Adjusted Net Capital Expenditures	= \$3,723 mil

- (Amortization was included in the depreciation number)

Working Capital Investments

- In accounting terms, the working capital is the difference between current assets (inventory, cash and accounts receivable) and current liabilities (accounts payables, short term debt and debt due within the next year)
- A cleaner definition of working capital from a cash flow perspective is the difference between non-cash current assets (inventory and accounts receivable) and non-debt current liabilities (accounts payable)
- Any investment in this measure of working capital ties up cash. Therefore, any increases (decreases) in working capital will reduce (increase) cash flows in that period.
- When forecasting future growth, it is important to forecast the effects of such growth on working capital needs, and building these effects into the cash flows.

Working Capital: General Propositions

- Changes in non-cash working capital from year to year tend to be volatile. A far better estimate of non-cash working capital needs, looking forward, can be estimated by looking at non-cash working capital as a proportion of revenues
- Some firms have negative non-cash working capital. Assuming that this will continue into the future will generate positive cash flows for the firm. While this is indeed feasible for a period of time, it is not forever. Thus, it is better that non-cash working capital needs be set to zero, when it is negative.

Volatile Working Capital?

	Amazon	Cisco	Motorola
Revenues	$ 1,640	$12,154	$30,931
Non-cash WC	-$419	-$404	$2547
% of Revenues	-25.53%	-3.32%	8.23%
Change from last year	$ (309)	($700)	($829)
Average: last 3 years	-15.16%	-3.16%	8.91%
Average: industry	8.71%	-2.71%	7.04%
WC as % of Revenue	3.00%	0.00%	8.23%

Dividends and Cash Flows to Equity

- In the strictest sense, the only cash flow that an investor will receive from an equity investment in a publicly traded firm is the dividend that will be paid on the stock.
- Actual dividends, however, are set by the managers of the firm and may be much lower than the potential dividends (that could have been paid out)
  - managers are conservative and try to smooth out dividends
  - managers like to hold on to cash to meet unforeseen future contingencies and investment opportunities
- When actual dividends are less than potential dividends, using a model that focuses only on dividends will under state the true value of the equity in a firm.

Measuring Potential Dividends

- Some analysts assume that the earnings of a firm represent its potential dividends. This cannot be true for several reasons:
  - Earnings are not cash flows, since there are both non-cash revenues and expenses in the earnings calculation
  - Even if earnings were cash flows, a firm that paid its earnings out as dividends would not be investing in new assets and thus could not grow
  - Valuation models, where earnings are discounted back to the present, will over estimate the value of the equity in the firm
- The potential dividends of a firm are the cash flows left over after the firm has made any "investments" it needs to make to create future growth and net debt repayments (debt repayments - new debt issues)
  - The common categorization of capital expenditures into discretionary and non-discretionary loses its basis when there is future growth built into the valuation.

Estimating Cash Flows: FCFE

- Cash flows to Equity for a Levered Firm

  Net Income

  - (Capital Expenditures - Depreciation)

  - Changes in non-cash Working Capital

  - (Principal Repayments - New Debt Issues)

  = Free Cash flow to Equity

- I have ignored preferred dividends. If preferred stock exist, preferred dividends will also need to be netted out

Estimating FCFE when Leverage is Stable

Net Income

- $(1-\delta)$ (Capital Expenditures - Depreciation)
- $(1-\delta)$ Working Capital Needs

= Free Cash flow to Equity

δ = Debt/Capital Ratio

For this firm,

- Proceeds from new debt issues = Principal Repayments + δ (Capital Expenditures - Depreciation + Working Capital Needs)

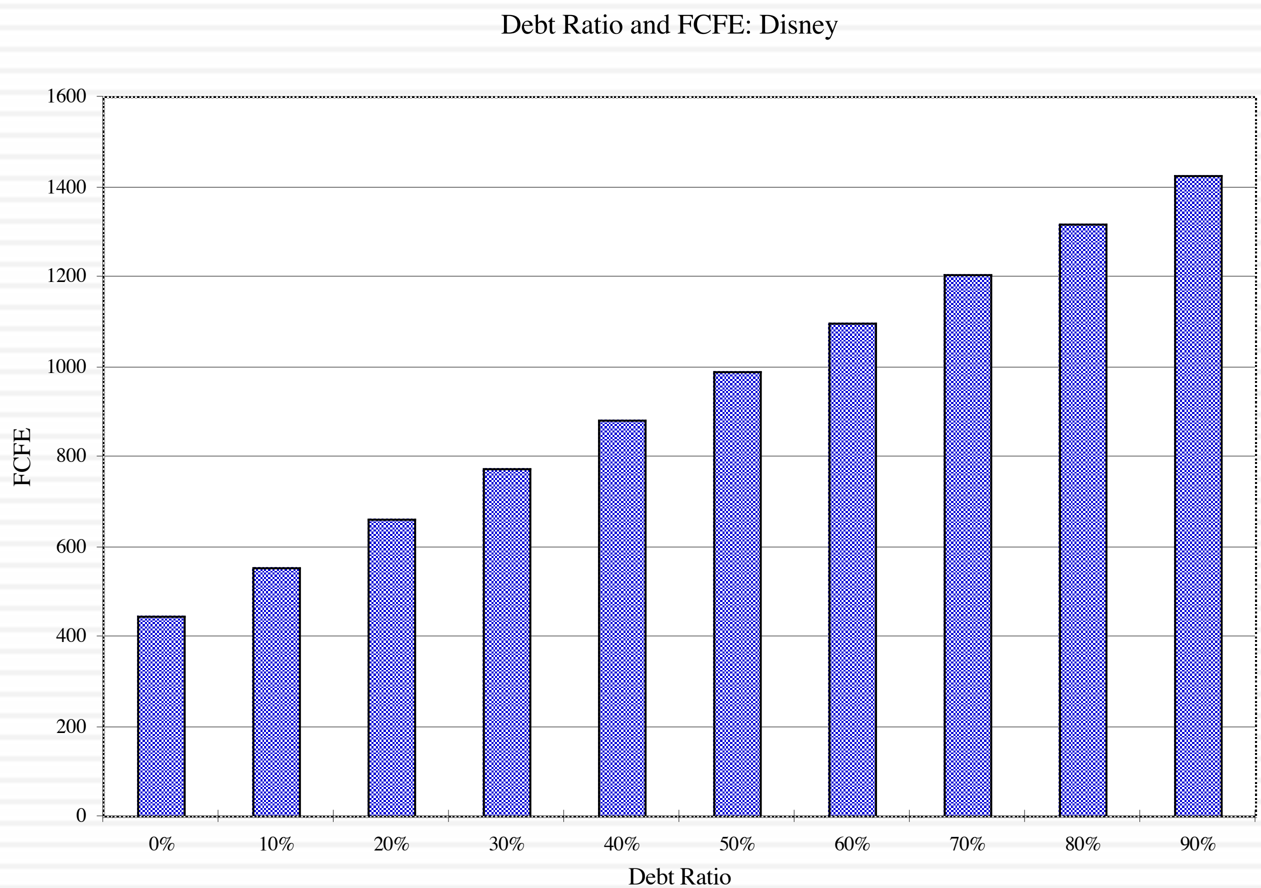
- In computing FCFE, the book value debt to capital ratio should be used when looking back in time but can be replaced with the market value debt to capital ratio, looking forward.

Estimating FCFE: Disney

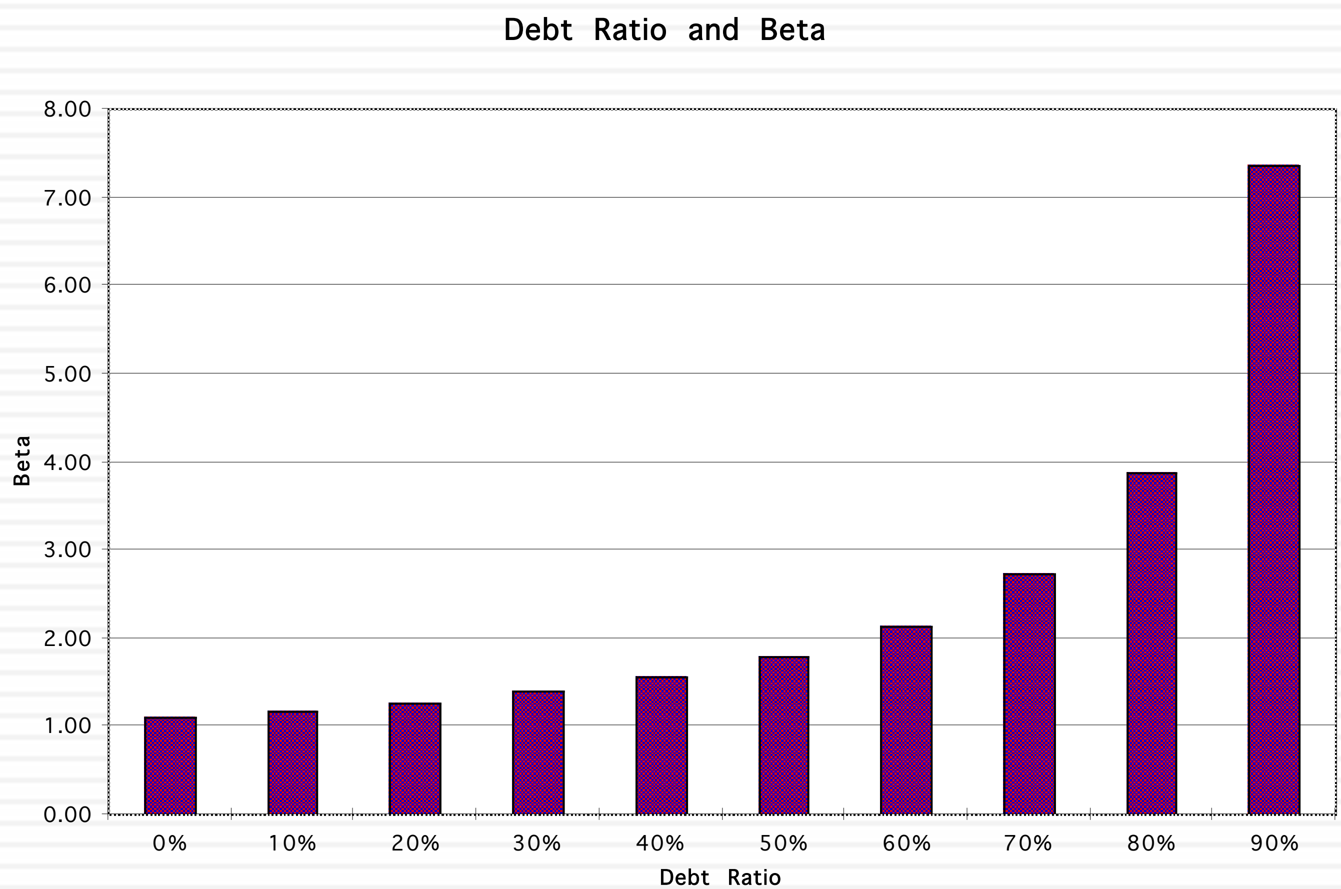
- Net Income=$ 1533 Million
- Capital spending = $ 1,746 Million
- Depreciation per Share = $ 1,134 Million
- Increase in non-cash working capital = $ 477 Million
- Debt to Capital Ratio = 23.83%
- Estimating FCFE (1997):

Net Income	$1,533 Mil
- (Cap. Exp - Depr)*(1-DR)	$465.90 [(1746-1134)(1-.2383)]
Chg. Working Capital*(1-DR)	$363.33 [477(1-.2383)]
= Free CF to Equity	$ 704 Million
Dividends Paid	$ 345 Million

FCFE and Leverage: Is this a free lunch?

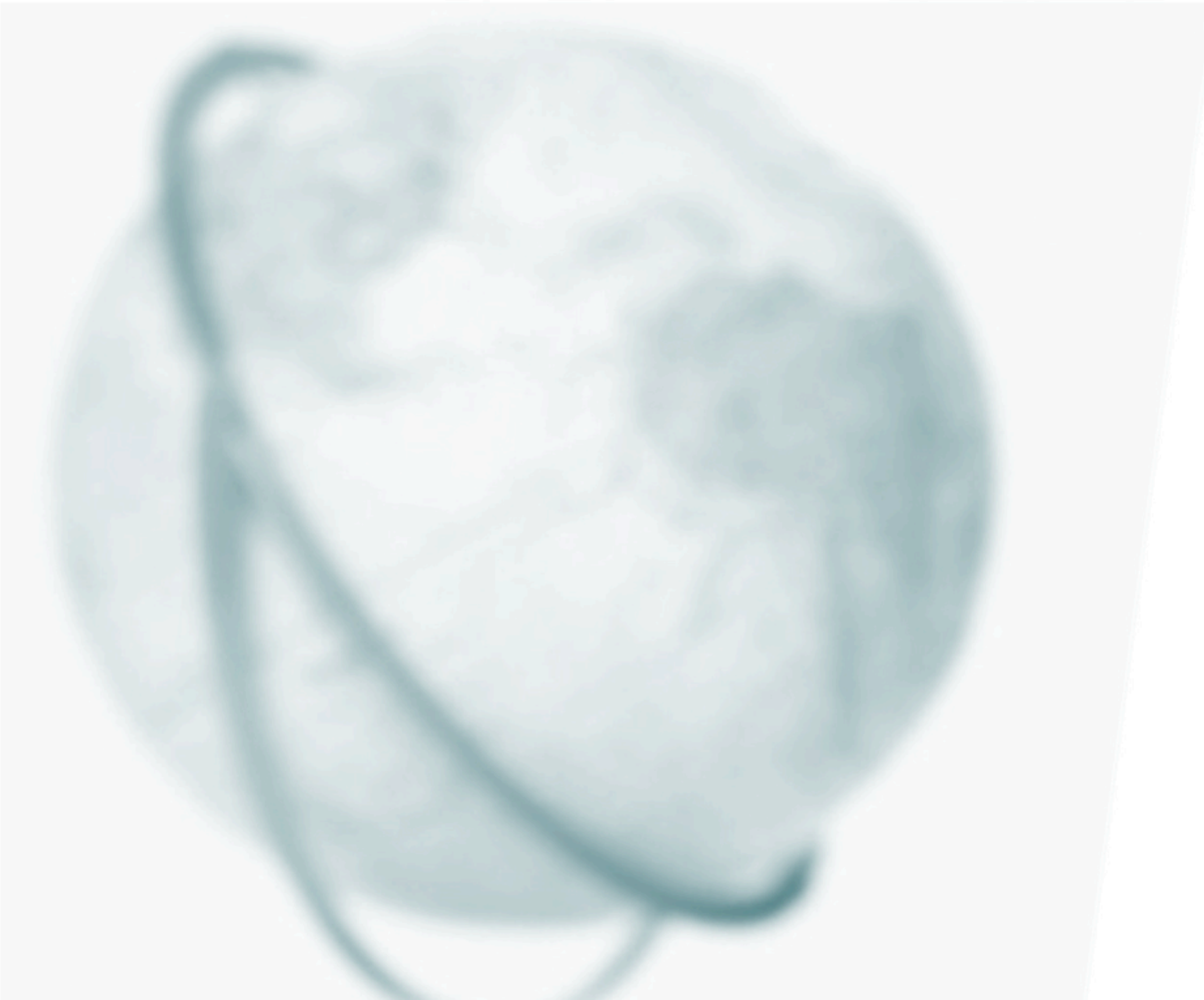


FCFE and Leverage: The Other Shoe Drops



Leverage, FCFE and Value

- In a discounted cash flow model, increasing the debt/equity ratio will generally increase the expected free cash flows to equity investors over future time periods and also the cost of equity applied in discounting these cash flows. Which of the following statements relating leverage to value would you subscribe to?
  a. Increasing leverage will increase value because the cash flow effects will dominate the discount rate effects
  b. Increasing leverage will decrease value because the risk effect will be greater than the cash flow effects
  c. Increasing leverage will not affect value because the risk effect will exactly offset the cash flow effect
  d. Any of the above, depending upon what company you are looking at and where it is in terms of current leverage



III. ESTIMATING GROWTH

Growth can be good, bad or neutral…

Ways of Estimating Growth in Earnings

- Look at the past
  - The historical growth in earnings per share is usually a good starting point for growth estimation
- Look at what others are estimating
  - Analysts estimate growth in earnings per share for many firms. It is useful to know what their estimates are.
- Look at fundamentals
  - Ultimately, all growth in earnings can be traced to two fundamentals - how much the firm is investing in new projects, and what returns these projects are making for the firm.

I. Historical Growth in EPS

- Historical growth rates can be estimated in a number of different ways
  - Arithmetic versus Geometric Averages
  - Simple versus Regression Models
- Historical growth rates can be sensitive to
  - the period used in the estimation
- In using historical growth rates, the following factors have to be considered
  - how to deal with negative earnings
  - the effect of changing size

Motorola: Arithmetic versus Geometric Growth Rates

	Revenues	% Change	EBITDA	% Change	EBIT	% Change
1994	$ 22,245		$ 4,151		$ 2,604	
1995	$ 27,037	21.54%	$ 4,850	16.84%	$ 2,931	12.56%
1996	$ 27,973	3.46%	$ 4,268	-12.00%	$ 1,960	-33.13%
1997	$ 29,794	6.51%	$ 4,276	0.19%	$ 1,947	-0.66%
1998	$ 29,398	-1.33%	$ 3,019	-29.40%	$ 822	-57.78%
1999	$ 30,931	5.21%	$ 5,398	78.80%	$ 3,216	291.24%
Arithmetic Average		7.08%		10.89%		42.45%
Geometric Average		6.82%		5.39%		4.31%
Standard deviation		8.61%		41.56%		141.78%

A Test

- You are trying to estimate the growth rate in earnings per share at Time Warner from 1996 to 1997. In 1996, the earnings per share was a deficit of $0.05. In 1997, the expected earnings per share is $ 0.25. What is the growth rate?

a. -600%
b. +600%
c. +120%
d. Cannot be estimated

Dealing with Negative Earnings

- When the earnings in the starting period are negative, the growth rate cannot be estimated. (0.30/-0.05 = -600%)
- There are three solutions:
  - Use the higher of the two numbers as the denominator (0.30/0.25 = 120%)
  - Use the absolute value of earnings in the starting period as the denominator (0.30/0.05=600%)
  - Use a linear regression model and divide the coefficient by the average earnings.
- When earnings are negative, the growth rate is meaningless. Thus, while the growth rate can be estimated, it does not tell you much about the future.

The Effect of Size on Growth: Callaway Golf

Year	Net Profit	Growth Rate
1990	1.80	
1991	6.40	255.56%
1992	19.30	201.56%
1993	41.20	113.47%
1994	78.00	89.32%
1995	97.70	25.26%
1996	122.30	25.18%

- Geometric Average Growth Rate = 102%

Extrapolation and its Dangers

Year	Net Profit
1996	$ 122.30
1997	$ 247.05
1998	$ 499.03
1999	$ 1,008.05
2000	$ 2,036.25
2001	$ 4,113.23

- If net profit continues to grow at the same rate as it has in the past 6 years, the expected net income in 5 years will be $ 4.113 billion.