

R&D Expenses: Operating or Capital Expenses

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- Accounting standards require us to consider R&D as an operating expense even though it is designed to generate future growth. It is more logical to treat it as capital expenditures.
- To capitalize R&D,
 - Specify an amortizable life for R&D (2 - 10 years)
 - Collect past R&D expenses for as long as the amortizable life
 - Sum up the unamortized R&D over the period. (Thus, if the amortizable life is 5 years, the research asset can be obtained by adding up 1/5th of the R&D expense from five years ago, 2/5th of the R&D expense from four years ago...:

Capitalizing R&D Expenses: SAP

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- R & D was assumed to have a 5-year life.

Year	R&D Expense	Unamortized		Amortization this year
Current	1020.02	1.00	1020.02	
-1	993.99	0.80	795.19	€ 198.80
-2	909.39	0.60	545.63	€ 181.88
-3	898.25	0.40	359.30	€ 179.65
-4	969.38	0.20	193.88	€ 193.88
-5	744.67	0.00	0.00	€ 148.93

Value of research asset = € 2,914 million

Amortization of research asset in 2004 = € 903 million

Increase in Operating Income = $1020 - 903 =$ € 117 million

The Effect of Capitalizing R&D at SAP

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<i>Conventional Accounting</i>	<i>R&D treated as capital expenditure</i>						
<p><i>Income Statement</i></p> <p>EBIT& R&D = 3045 - R&D = 1020 EBIT = 2025 EBIT (1-t) = 1285 m</p>	<p><i>Income Statement</i></p> <p>EBIT& R&D = 3045 - Amort: R&D = 903 EBIT = 2142 (Increase of 117 m) EBIT (1-t) = 1359 m Ignored tax benefit = (1020-903)(.3654) = 43 Adjusted EBIT (1-t) = 1359+43 = 1402 m (Increase of 117 million) Net Income will also increase by 117 million</p>						
<p><i>Balance Sheet</i></p> <p>Off balance sheet asset. Book value of equity at 3,768 million Euros is understated because biggest asset is off the books.</p>	<p><i>Balance Sheet</i></p> <table> <tr> <td>Asset</td> <td>Liability</td> </tr> <tr> <td>R&D Asset 2914</td> <td>Book Equity +2914</td> </tr> <tr> <td colspan="2">Total Book Equity = 3768+2914= 6782 mil</td> </tr> </table>	Asset	Liability	R&D Asset 2914	Book Equity +2914	Total Book Equity = 3768+2914= 6782 mil	
Asset	Liability						
R&D Asset 2914	Book Equity +2914						
Total Book Equity = 3768+2914= 6782 mil							
<p><i>Capital Expenditures</i></p> <p>Conventional net cap ex of 2 million Euros</p>	<p><i>Capital Expenditures</i></p> <p>Net Cap ex = 2+ 1020 - 903 = 119 mil</p>						
<p><i>Cash Flows</i></p> <p>EBIT (1-t) = 1285 - Net Cap Ex = 2 FCFF = 1283</p>	<p><i>Cash Flows</i></p> <p>EBIT (1-t) = 1402 - Net Cap Ex = 119 FCFF = 1283 m</p>						
<p>Return on capital = 1285/(3768+530)</p>	<p>Return on capital = 1402/(6782+530)</p>						

III. One-Time and Non-recurring Charges

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- Assume that you are valuing a firm that is reporting a loss of \$ 500 million, due to a one-time charge of \$ 1 billion. What is the earnings you would use in your valuation?
 - a. A loss of \$ 500 million
 - b. A profit of \$ 500 million
- Would your answer be any different if the firm had reported one-time losses like these once every five years?
 - a. Yes
 - b. No

IV. Accounting Malfeasance....

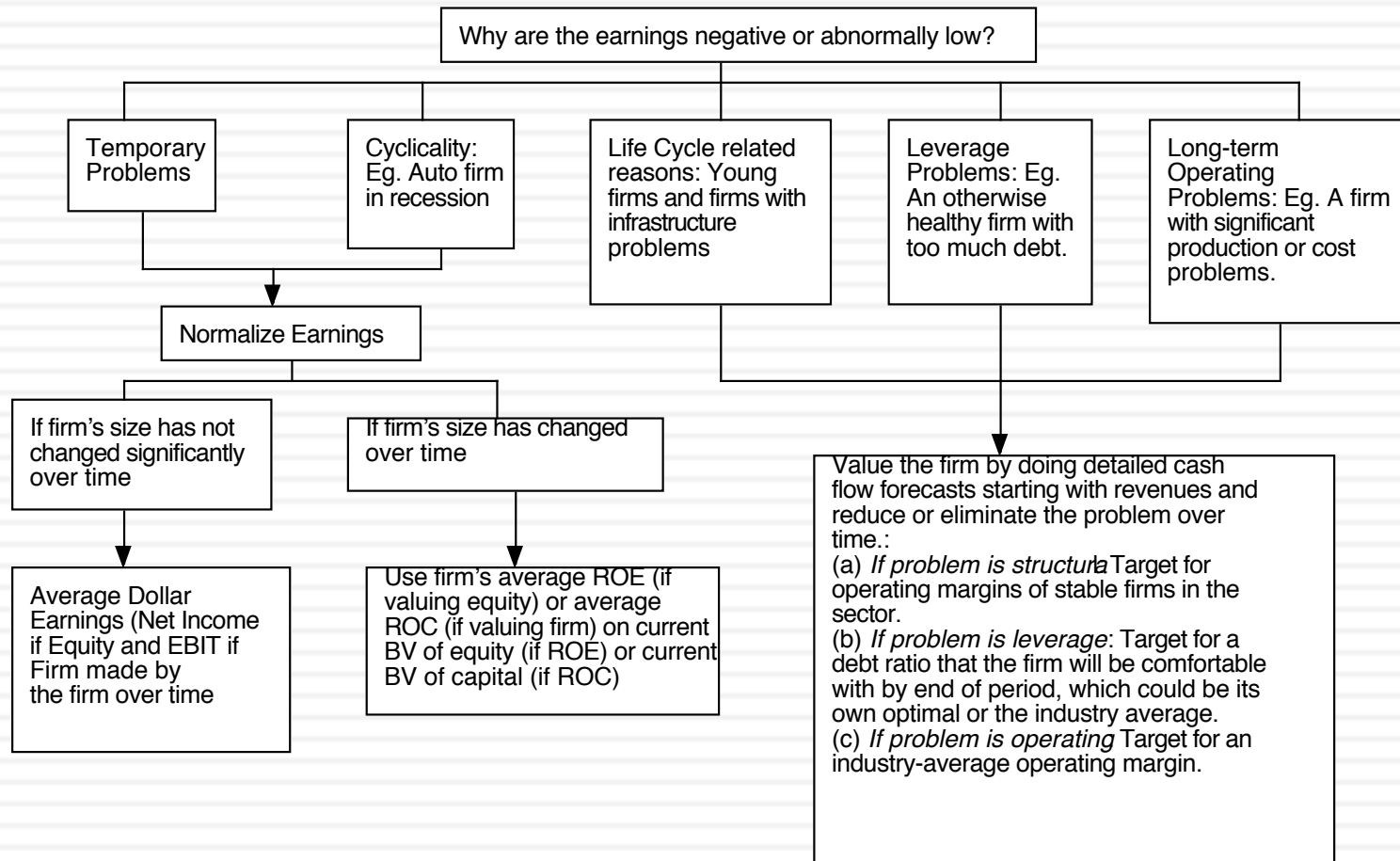
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- Though all firms may be governed by the same accounting standards, the fidelity that they show to these standards can vary. More aggressive firms will show higher earnings than more conservative firms.
- While you will not be able to catch outright fraud, you should look for warning signals in financial statements and correct for them:
 - ▣ Income from unspecified sources - holdings in other businesses that are not revealed or from special purpose entities.
 - ▣ Income from asset sales or financial transactions (for a non-financial firm)
 - ▣ Sudden changes in standard expense items - a big drop in S,G &A or R&D expenses as a percent of revenues, for instance.
 - ▣ Frequent accounting restatements
 - ▣ Accrual earnings that run ahead of cash earnings consistently
 - ▣ Big differences between tax income and reported income

V. Dealing with Negative or Abnormally Low Earnings

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A Framework for Analyzing Companies with Negative or Abnormally Low Earnings



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Cash Flows II

Taxes and Reinvestment

What tax rate?

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- 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

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- 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

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- 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

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- 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

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

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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

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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

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- 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)
- For firms in some sectors, it is the investment in working capital that is the bigger part of reinvestment.

Working Capital: General Propositions

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1. Working Capital Detail: While some analysts break down working capital into detail (inventory, deferred taxes, payables etc.), it is a pointless exercise unless you feel that you can bring some specific information that lets you forecast the details.
2. Working Capital Volatility: Changes in non-cash working capital from year to year tend to be volatile. So, building of the change in the most recent year is dangerous. It is better to either estimate the change based on working capital as a percent of sales, while keeping an eye on industry averages.
3. Negative Working Capital: Some firms have negative non-cash working capital. Assuming that this will continue into the future will generate positive cash flows for the firm and will get more positive as growth increases.

Volatile Working Capital?

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	<i>Amazon</i>	<i>Cisco</i>	<i>Motorola</i>
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%
	<i>My Prediction</i>		
WC as % of Revenue	3.00%	0.00%	8.23%

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Cash Flows III

From the firm to equity

Dividends and Cash Flows to Equity

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- 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 understate the true value of the equity in a firm.

Measuring Potential Dividends

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- 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

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□ 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

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Net Income

- (1- DR) (Capital Expenditures - Depreciation)
- (1- DR) Working Capital Needs
- = Free Cash flow to Equity

DR = Debt/Capital Ratio

For this firm,

- Proceeds from new debt issues = Principal Repayments + \square (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.

FCFE from the statement of cash flows

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- The statement of cash flows can be used to back into a FCFE, if you are willing to navigate your way through it and not trust it fully.
- FCFE
 - = Cashflow from Operations
 - Capital Expenditures (from the cash flow from investments)
 - Cash Acquisitions (from the cash flow from investments)
 - (Debt Repaid – Debt Issued) (from financing cash flows)
 - = FCFE
- Alternatively, you can also do the following:
 - ▣ $FCFE - Dividends + Stock\ Buybacks - Stock\ Issuances + Change\ in\ Cash\ Balance$

Dividends versus FCFE: Across the globe

<i>Sub Group</i>	<i>FCFE</i>	<i>Dividends</i>	<i>Buybacks</i>	<i>Dividends + Buybacks</i>	<i>% of dividend paying firms</i>
Africa and Middle East	\$85,659	\$114,879	\$3,083	\$117,963	54.64%
Australia & NZ	\$14,445	\$31,975	\$9,846	\$41,821	27.63%
Canada	\$5,499	\$36,040	\$31,425	\$67,466	12.41%
China	\$50,327	\$299,196	\$19,147	\$318,342	73.63%
EU & Environs	\$167,899	\$290,900	\$117,861	\$408,762	43.67%
E. Europe & Russia	\$34,187	\$27,491	\$5,546	\$33,037	43.01%
India	\$44,762	\$24,602	\$6,669	\$31,271	29.41%
Japan	(\$42,357)	\$110,331	\$70,847	\$181,178	69.68%
Latin America	(\$13,487)	\$35,631	\$5,068	\$40,700	60.00%
Small Asia	(\$43,076)	\$116,261	\$10,655	\$126,916	54.69%
UK	\$11,429	\$70,864	\$35,382	\$106,245	51.60%
United States	\$290,411	\$499,570	\$700,425	\$1,199,995	21.95%
Global	\$605,699	\$1,657,741	\$1,015,955	\$2,673,696	46.66%

Estimating FCFE: Disney

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- 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 (DR) = 23.83%
- Estimating FCFE (1997):

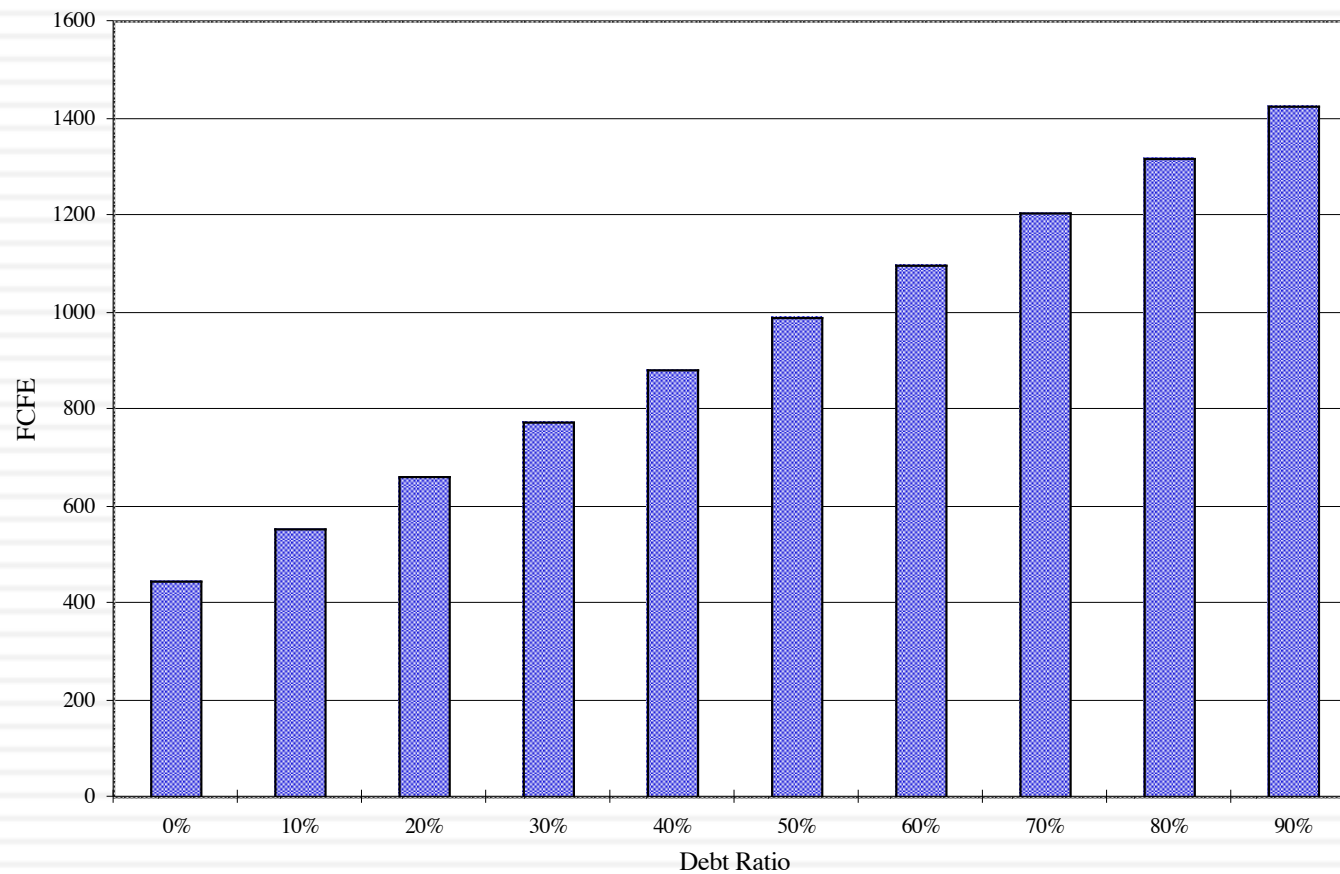
Net Income	\$1,533 Mil
- (Cap. Exp - Depr)*(1-DR)	\$465.90 [(1746-1134)(1-.2383)]
Chg. Working Capital*(1-DR)	\$363.33 [477(1-.2383)]
= Free CF to Equity	\$ 704 Million

Dividends Paid	\$ 345 Million
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FCFE and Leverage: Is this a free lunch?

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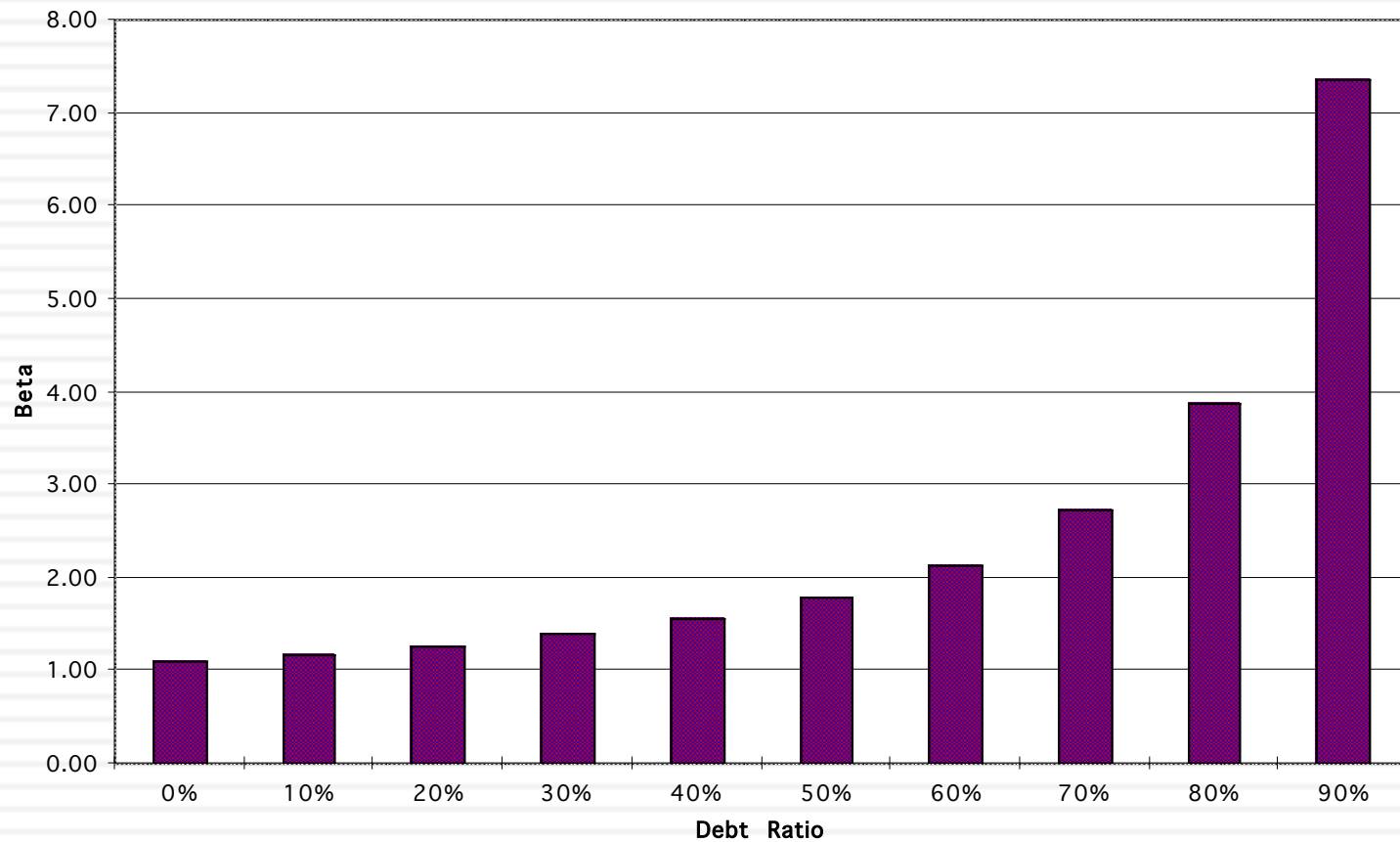
Debt Ratio and FCFE: Disney



FCFE and Leverage: The Other Shoe Drops

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Debt Ratio and Beta



Leverage, FCFE and Value

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- 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