

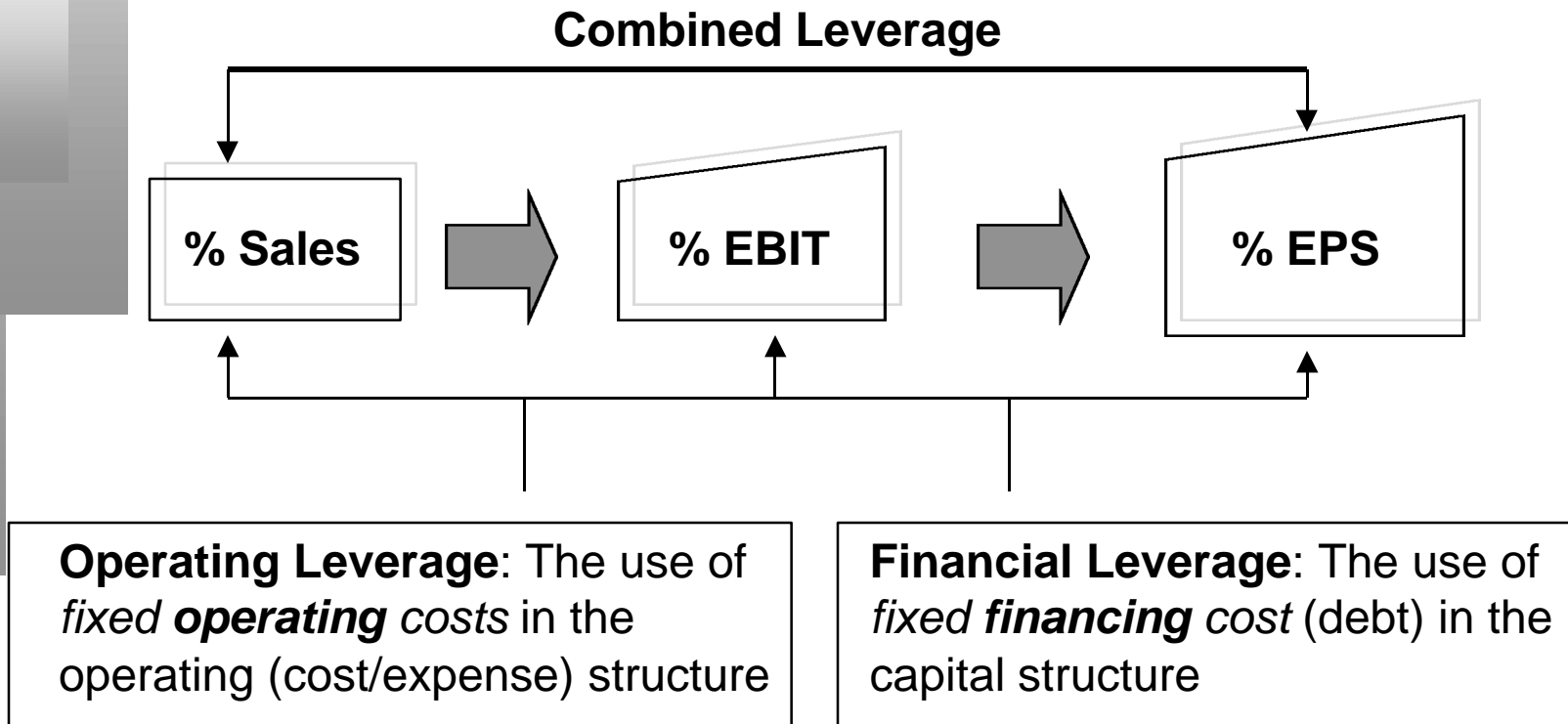


Some Financial Tools for Industry Analysis

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Leverage: It Comes in Two Flavors



Operating Leverage:

Which type of leverage is more under management's control?

- operating structure: substitution among labor (variable) and machinery (fixed)
- financial structure: substitution among various sources of financial capital

Operating leverage exists if

$$\frac{(\text{EBIT}_t - \text{EBIT}_{t-1})/\text{EBIT}_{t-1}}{(\text{Sales}_t - \text{Sales}_{t-1})/\text{Sales}_{t-1}} = \frac{\% \Delta \text{ EBIT}}{\% \Delta \text{ Sales}} > 1$$

The greater the degree of operating leverage, the more profits vary with a given percentage change in sales

Whether an increase operating leverage is warranted depends in part on whether the prospects for future sales increases are high or unattractive.

Financial Leverage:

Financial leverage exists when

$$\frac{(\text{EPS}_t - \text{EPS}_{t-1}) / \text{EPS}_{t-1}}{(\text{EBIT}_t - \text{EBIT}_{t-1}) / \text{EBIT}_{t-1}} = \frac{\% \Delta \text{EPS}}{\% \Delta \text{EBIT}} > 1$$

Indicates what happens to a firm's earnings per share when financial risk is assumed



What happens if too much leverage is used

*Combined Leverage: Operating Leverage * Financial Leverage*

Combined Leverage is the total risk exposure a firm assumes can be managed by combining operating and financial leverage in different degrees.

$$DOL * DFL = \frac{\% \Delta \text{ EBIT}}{\% \Delta \text{ Sales}} * \frac{\% \Delta \text{ EPS}}{\% \Delta \text{ EBIT}} = \frac{\% \Delta \text{ EPS}}{\% \Delta \text{ Sales}} = DCL$$

DOL = Degree of Operating Leverage

DFL = Degree of Financial Leverage

DCL = Degree of Combined Leverage

What's the proper level of overall risk a firm should accept?

If the firm has a high level of fixed operating cost due to the line of business it is in, does this have any financial leverage implications?

Disney: Is this Entertainment?



	DIS Sales	%Δ Sales	DIS EBIT	%Δ EBIT	DIS EPS	%Δ EPS	DIS DOL	DIS DFL	DIS DCL
1987	2876.8		706.5		0.24				
1988	3438.2	19.5%	788.8	11.6%	0.32	33.3%	0.6	2.9	1.7
1989	4594.3	33.6%	1109.4	40.6%	0.43	34.4%	1.2	0.8	1.0
1990	5843.7	27.2%	1287	16.0%	0.5	16.3%	0.6	1.0	0.6
1991	6182.4	5.8%	1004.1	-22.0%	0.4	-20.0%	-3.8	0.9	-3.5
1992	7504	21.4%	1287.1	28.2%	0.51	27.5%	1.3	1.0	1.3
1993	8529.2	13.7%	1560	21.2%	0.41	-19.6%	1.6	-0.9	-1.4
1994	10055	17.9%	1803	15.6%	0.68	65.9%	0.9	4.2	3.7
1995	12112	20.5%	2262	25.5%	0.87	27.9%	1.2	1.1	1.4
1996	18739	54.7%	3024	33.7%	0.66	-24.1%	0.6	-0.7	-0.4
1997	22473	19.9%	3945	30.5%	0.97	47.0%	1.5	1.5	2.4
Avg		23.4%		20.1%		18.9%	0.9	0.9	0.8
Avg (xcl 1996)		19.9%		18.6%		23.6%	0.9	1.3	1.2

**Disney acquired Capital Cities in 1996*

Disney: Is this Entertainment?

Interpretation of Operating Leverage

If $DOL = 6$ then a 1% change in sales will result in a 6% fluctuation in EBIT e.g. EBIT will be six times as great

Does Disney use operating leverage e.g., does it have fixed cost which tend to magnify the fluctuations in EBIT?

Given that the $DOL = 1.15$ for other entertainment firms, what can we say about Disney's fixed costs?

- Operating leverage can be negative or positive
- In reality, the sales, EBIT and EPS used in $t+1$ are the *forecasted* levels.

A Note on Business Risk: What Drives it?

<i>Components of Business Risk</i>	<i>If YES, then Greater Business Risk Exposure</i>
Sensitivity of firm's product demand to general economic conditions	If GNP declines, does the firm's sales level decline by a greater percentage?
Degree of competition	Is the firm's market share small in comparison with other firms that produce and distribute the same product?
Product diversification	Is a large proportion of the firm's sales revenue derived from a single major product or product line?
Operating leverage	Does the firm utilize a high level of operating leverage resulting in a high level of fixed costs?
Growth prospects	Are the firm's product markets expanding and/or changing, making income estimates and prospects highly volatile?
Size	Does the firm suffer a competitive disadvantage due to lack of size in assets, sales, or profits that translates into difficulty in tapping the capital market for funds?

Calculating Business Risk:

To calculate business risk, use a minimum of 5-10 years of EBIT.

$$\text{Business Risk} = \frac{s_{\text{EBIT}}}{m_{\text{EBIT}}}$$

$$m_{\text{EBIT}} = \frac{\sum_{t=1}^N \text{EBIT}_t}{N} = \overline{\text{EBIT}} = \text{Average}$$

$$s_{\text{EBIT}} = \frac{\sqrt{\sum_{t=1}^N (\text{EBIT}_t - \overline{\text{EBIT}})^2}}{N}$$

Year	Disney EBIT	Disney (EBIT- μ) ²
1993	1560.3	1365820.7
1994	1803.5	856519.4
1995	2262.1	217980.0
1996	3024	87034.8
1997	3945	1478696.5
1998	3779	1102535.0
Sum (Σ)	16373.9	5108586.5
Count (N)	6	6
Mean (μ)	2729.0	851431.1
StDev(σ)		922.7
CV(σ/μ)	.34	Business risk

Business Risk: Comparison Across the Media Entertainment (Diversified) Industry

The coefficient of variation a.k.a business risk for Time Warner (TWX) indicates that on average, \$1 of EBIT can vary 31¢ (or 31%) in either direction.

Which company has the lowest business risk in the entertainment industry?

Which companies have comparable business risk?

	TWX	NWS	DIS	VIAB	KWP
1997	1190	1267	3945	752.8	192.3
1996	888	1252	3024	1363	191.6
1995	623	1178	2262	1493	162.5
1994	637	1164	1804	608.3	127.5
1993	518	1135	1560	384.9	151
Mean(μ)	771.2	1199	2519	920.5	165
StDev(σ)	242.1	51.49	870.1	432.8	24.74
CV(σ/μ)	.31	.04	.35	.47	.15

TWX = Time Warner

NWS = News Corp

DIS = Disney

VIAB = Viacom

KWP = King World Productions

Using Business Risk Results with Leverage Ratios:

	TWX	NWS	DIS	VIAB	KWP
Interest Coverage	1.8	2.8	5.9	2.4	NC
EBIT (\$Mil)	1190	1267.4	3945	752.8	192.3
Interest Expense (Int)	661	453	669	314	0
(EBIT-Int)/EBIT	.44	.64	.83	.58	NC
Business risk (CV)	.31	.04	.35	.47	.15

(EBIT-Int)/EBIT = Percentage EBIT can decline before interest coverage is 1

Example: The business risk for Time Warner (TWX) is 31% which means that \$1 of EBIT can vary either up or down by 31%. The [(EBIT-Int)/EBIT] = %EBIT can decline before interest coverage is 1 e.g. before EBIT is just enough to offset interest expense is 44%. Does this leave TWX much “breathing room”? Should TWX use debt financing if it has new NPV>0 projects?

Sustainable Growth:

Sustainable Growth: maximum rate at which company sales can increase without depleting financial resources.

Condition

Fast Growth Company:
Actual Growth(g_A) >
Sustainable Growth(g_S)

Where to get the cash
to continue fast growth

Management Strategies

- Borrow cash if only a short term problem ($g_S \uparrow$)
- Sell new equity
- Increase leverage ($g_S \uparrow$)
- Reduce dividend payout ratio ($g_S \uparrow$)
- Profitable pruning: sell off marginal operations and plow money back into remaining businesses ($g_A \downarrow$)
- Out sourcing: do less in-house ($g_S \uparrow$)
- Increase prices ($g_S \uparrow$ and $g_A \downarrow$)
- Merger

Moral: Growth isn't necessarily something to maximize

Sustainable Growth:

Condition

Slow Growth Company:
Actual Growth(g_A) <
Sustainable Growth(g_S)

What to do with profits
in excess of company
needs

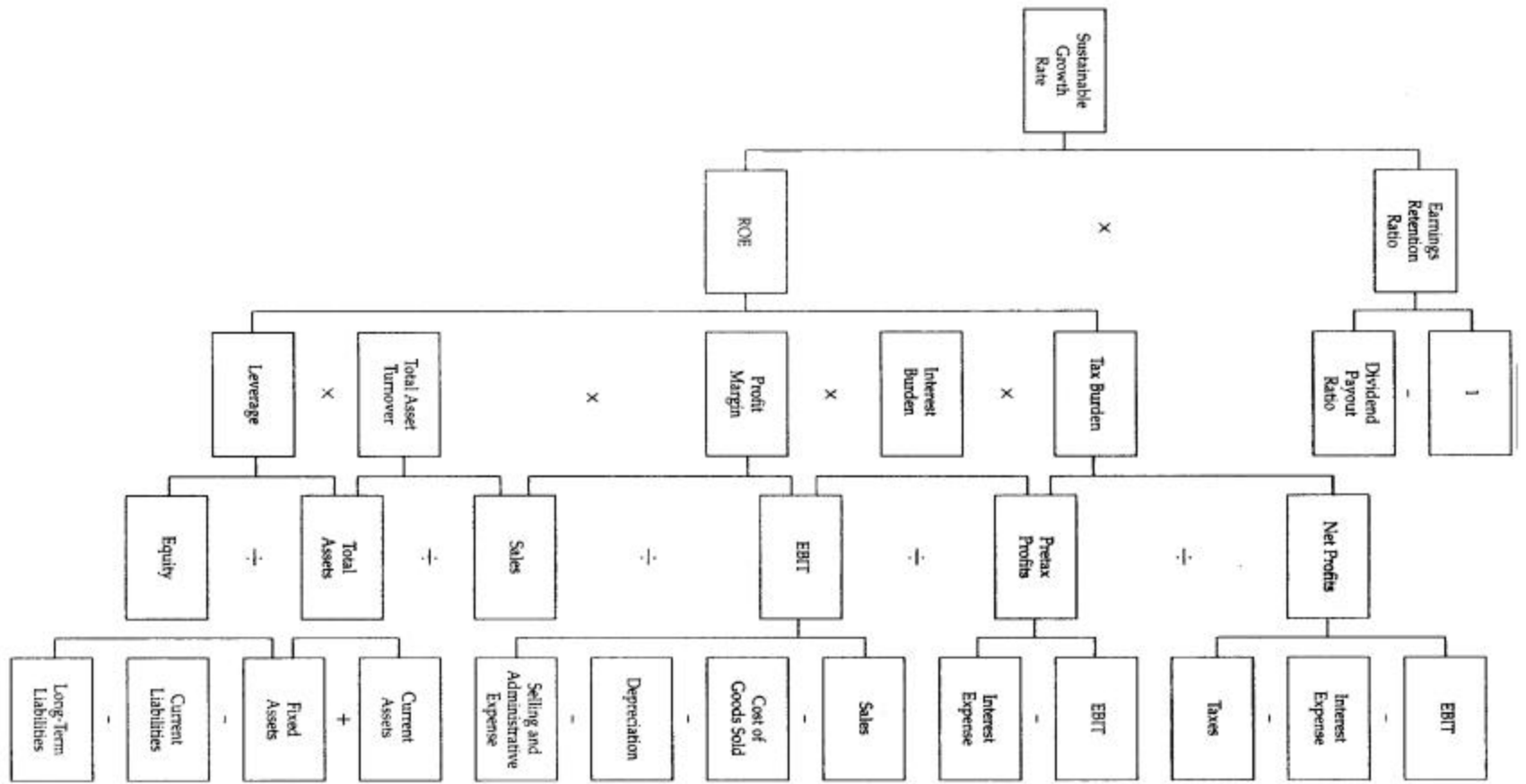
Management Strategies

- Continue to accumulate resources if short term problem
- Internal growth via \uparrow R&D and organizational Δ ($g_A \uparrow$)
- Ignore problem: increases $p(b)$ of management firings
- Increase dividends ($g_S \downarrow$)
- Repurchase shares ($g_S \downarrow$)
- Buy growth: diversify into other businesses ($g_A \uparrow$)

Financing decision is placed within the larger context of managing growth

Challenge: Develop dividend, financing, and growth strategies that enable firm to expand at the desired rate without resorting to issuing new stock

Using The DuPont Model to Calculate Sustainable Growth:



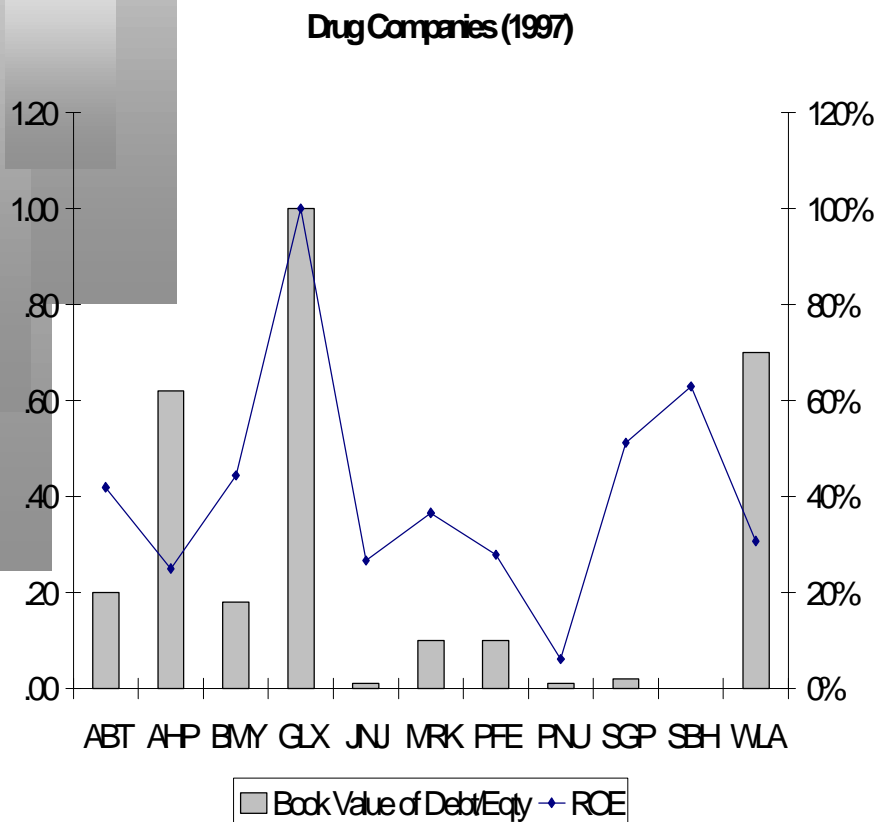
Rapid Growth and the Virtues of Conservatism

The most powerful engine of value creation in a growing business is new investment, not interest tax shields or levered equity from debt financing.

Pecking order: The financing strategy that best facilitates growth

- Maintain a conservative leverage ratio → ensures continuous market access
- Adopt a modest dividend policy → enables growth via internal financing
- Use cash, marketable securities, and unused borrowing capacity as temporary liquidity buffers in years when investment needs > internal sources
- If external financing is necessary, raise debt unless resulting leverage ratio threatens financial flexibility
- Sell equity or reduce growth only as a last resort

Observed Capital Structure: Drug Companies



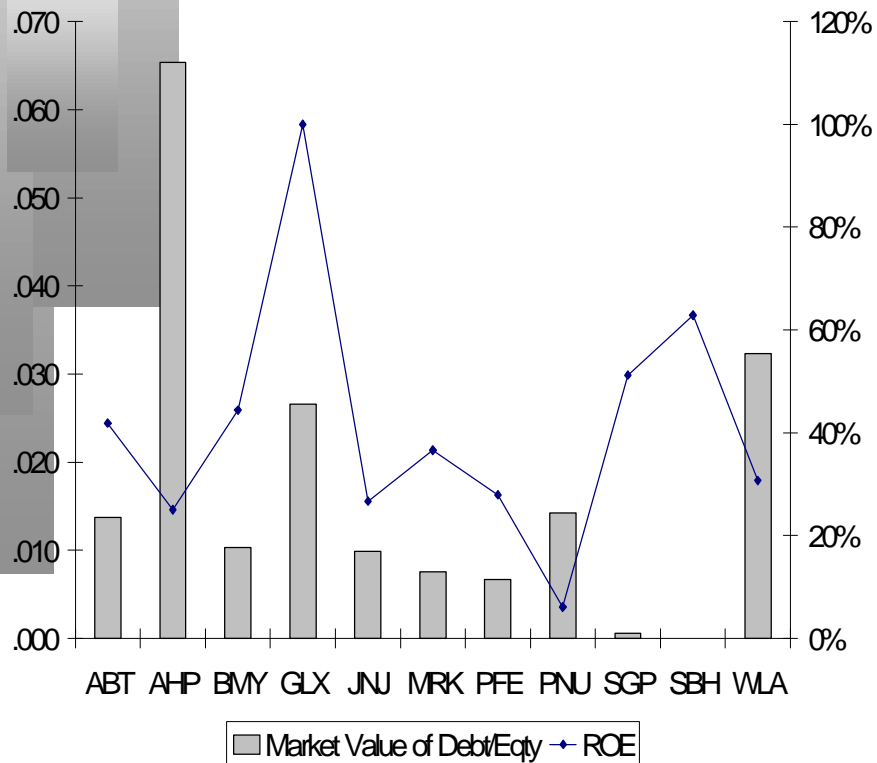
Firms that tend to have lower debt ratios:

- Firms whose value depends to a greater extent on intangibles (drug, semiconductors)
- firms in more volatile product markets (electronics, telecom)
- firms with high business risk

Are capital structures identical for drug companies based on book values?

Is there a relationship between debt/equity and ROE?

Observed Capital Structure: Drug Companies



Are capital structures identical for drug companies based on market values? (look closely at scale)

Is there a difference between book values and market values in terms of debt/equity ratios for drug companies?

Is there a relationship between the market value of debt/equity and ROE?