

Steps in Cash Flow Estimation

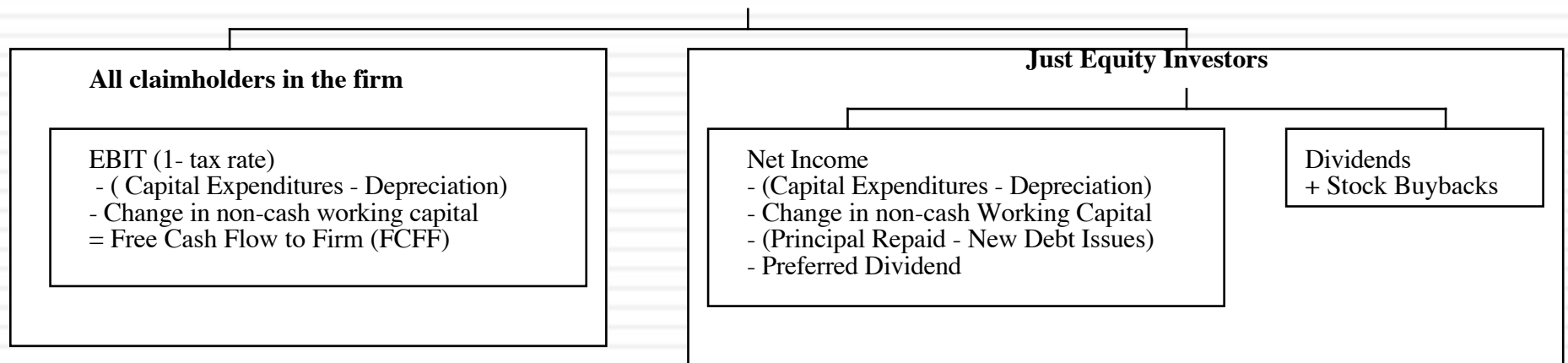
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- Estimate the current earnings of the firm
 - If looking at cash flows to equity, look at earnings after interest expenses - i.e. net income
 - If looking at cash flows to the firm, look at operating earnings after taxes
- Consider how much the firm invested to create future growth
 - If the investment is not expensed, it will be categorized as capital expenditures. To the extent that depreciation provides a cash flow, it will cover some of these expenditures.
 - Increasing working capital needs are also investments for future growth
- If looking at cash flows to equity, consider the cash flows from net debt issues (debt issued - debt repaid)

Measuring Cash Flows

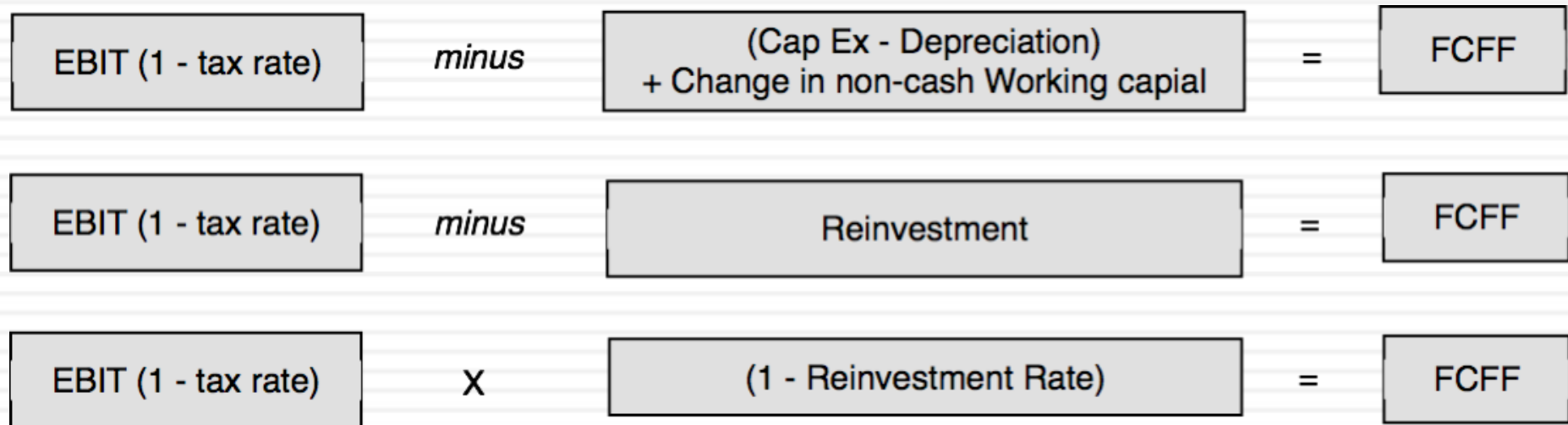
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Cash flows can be measured to



Measuring Cash Flow to the Firm: Three pathways to the same end game

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Where are the tax savings from interest expenses?

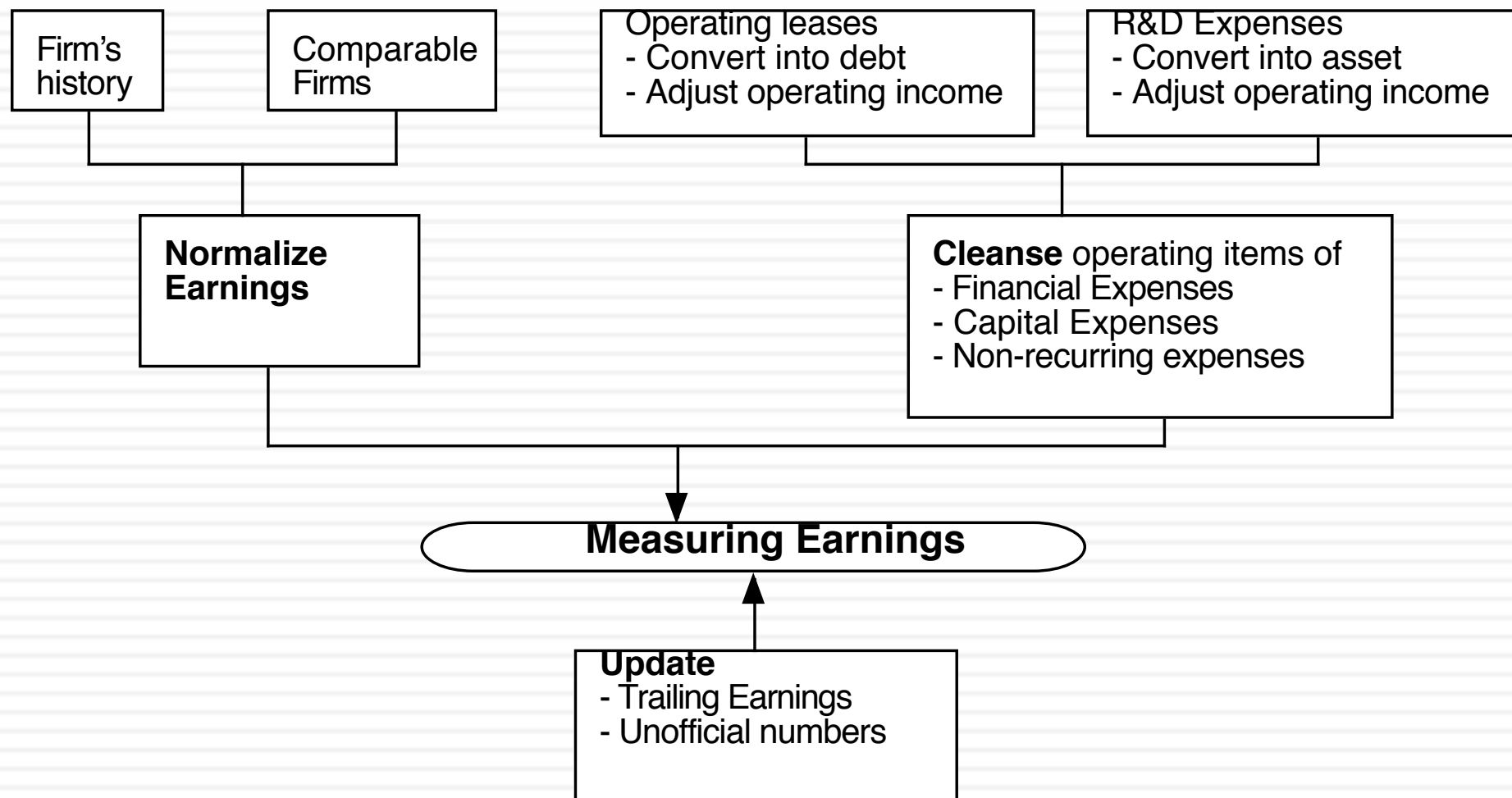
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Cash Flows I

Accounting Earnings, Flawed but Important

From Reported to Actual Earnings

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I. Update Earnings

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- When valuing companies, we often depend upon financial statements for inputs on earnings and assets. Annual reports are often outdated and can be updated by using-
 - Trailing 12-month data, constructed from quarterly earnings reports.
 - Informal and unofficial news reports, if quarterly reports are unavailable.
- Updating makes the most difference for smaller and more volatile firms, as well as for firms that have undergone significant restructuring.
- Time saver: To get a trailing 12-month number, all you need is one 10K and one 10Q (example third quarter). Use the Year to date numbers from the 10Q. For example, to get trailing revenues from a third quarter 10Q:
 - $\text{Trailing 12-month Revenue} = \text{Revenues (in last 10K)} - \text{Revenues from first 3 quarters of last year} + \text{Revenues from first 3 quarters of this year.}$

II. Correcting Accounting Earnings

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- Make sure that there are no financial expenses mixed in with operating expenses
 - Financial expense: Any commitment that is tax deductible that you have to meet no matter what your operating results: Failure to meet it leads to loss of control of the business.
 - Example: Operating Leases: While accounting convention treats operating leases as operating expenses, they are really financial expenses and need to be reclassified as such. This has no effect on equity earnings but does change the operating earnings
- Make sure that there are no capital expenses mixed in with the operating expenses
 - Capital expense: Any expense that is expected to generate benefits over multiple periods.
 - R & D Adjustment: Since R&D is a capital expenditure (rather than an operating expense), the operating income has to be adjusted to reflect its treatment.

The Magnitude of Operating Leases

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<i>Highest</i>		<i>Lowest</i>	
<i>Industry Name</i>	<i>Lease Expense/ Sales</i>	<i>Industry Name</i>	<i>Lease Expense/ Sales</i>
Air Transport	12.69%	Homebuilding	0.24%
Trucking	7.33%	Green & Renewable Energy	0.26%
Restaurant/Dining	5.95%	Insurance (Life)	0.34%
Telecom (Wireless)	5.75%	Steel	0.39%
Apparel	5.48%	Auto & Truck	0.41%
Real Estate (Operations & Services)	5.41%	Food Wholesalers	0.45%
Retail (Special Lines)	4.86%	Insurance (Prop/Cas.)	0.46%

Dealing with Operating Lease Expenses

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- Operating Lease Expenses are treated as operating expenses in computing operating income. In reality, operating lease expenses should be treated as financing expenses, with the following adjustments to earnings and capital:
- Debt Value of Operating Leases = Present value of Operating Lease Commitments at the pre-tax cost of debt
- When you convert operating leases into debt, you also create an asset to counter it of exactly the same value.
- Adjusted Operating Earnings
 - Adjusted Operating Earnings = Operating Earnings + Operating Lease Expenses - Depreciation on Leased AssetAs an approximation, this works:
 - Adjusted Operating Earnings = Operating Earnings + Pre-tax cost of Debt * PV of Operating Leases.

Operating Leases at The Gap in 2003

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- The Gap has conventional debt of about \$ 1.97 billion on its balance sheet and its pre-tax cost of debt is about 6%. Its operating lease payments in the 2003 were \$978 million and its commitments for the future are below:

Year	Commitment (millions)	Present Value (at 6%)
1	\$899.00	\$848.11
2	\$846.00	\$752.94
3	\$738.00	\$619.64
4	\$598.00	\$473.67
5	\$477.00	\$356.44
6&7	\$982.50 each year	\$1,346.04

- Debt Value of leases = \$4,396.85 (Also value of leased asset)
- Debt outstanding at The Gap = \$1,970 m + \$4,397 m = \$6,367 m
- Adjusted Operating Income = Stated OI + OL exp this year - Deprec' n
= \$1,012 m + 978 m - 4397 m /7 = \$1,362 million (7 year life for assets)
- Approximate OI = \$1,012 m + \$ 4397 m (.06) = \$1,276 m

The Collateral Effects of Treating Operating Leases as Debt

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<i>Conventional Accounting</i>	<i>Operating Leases Treated as Debt</i>								
<p><i>Income Statement</i></p> <p>EBIT& Leases = 1,990 - Op Leases = 978 EBIT = 1,012</p>	<p><i>Income Statement</i></p> <p>EBIT& Leases = 1,990 - Deprecn: OL= 628 EBIT = 1,362</p> <p>Interest expense will rise to reflect the conversion of operating leases as debt. Net income should not change.</p>								
<p><i>Balance Sheet</i></p> <p>Off balance sheet (Not shown as debt or as an asset). Only the conventional debt of \$1,970 million shows up on balance sheet</p>	<p><i>Balance Sheet</i></p> <table> <tr> <td>Asset</td> <td></td> <td>Liability</td> <td></td> </tr> <tr> <td>OL Asset</td> <td>4397</td> <td>OL Debt</td> <td>4397</td> </tr> </table> <p>Total debt = 4397 + 1970 = \$6,367 million</p>	Asset		Liability		OL Asset	4397	OL Debt	4397
Asset		Liability							
OL Asset	4397	OL Debt	4397						
<p>Cost of capital = $8.20\%(7350/9320) + 4\%(1970/9320) = 7.31\%$</p> <p>Cost of equity for The Gap = 8.20%</p> <p>After-tax cost of debt = 4%</p> <p>Market value of equity = 7350</p>	<p>Cost of capital = $8.20\%(7350/13717) + 4\%(6367/13717) = 6.25\%$</p>								
<p>Return on capital = $1012 (1-.35)/(3130+1970) = 12.90\%$</p>	<p>Return on capital = $1362 (1-.35)/(3130+6367) = 9.30\%$</p>								

Accounting comes to its senses on operating leases

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- In 2019, both IFRS and GAAP made a major shift on operating leases, requiring companies to capitalize leases and show the resulting debt (and counter asset) on the balance sheets.
- That said, the accounting rules for capitalizing leases are far more complex than the simple calculations that I have used, for two reasons:
 - ▣ Accounting has to balance its desire to do the right thing with maintaining some connection to its legacy rules.
 - ▣ Companies have lobbied to modify rules in their sectors to cushion the impact.

Checking on Accountants.... My lease estimate vs Accountants' Estimate

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Region	My Estimate	Accounting	Accounting as % of my estimate
Australia, NZ & Canada	\$ 13,578.86	\$ 8,412.39	61.95%
United States	\$ 1,152,869.85	\$ 947,989.30	82.23%
Europe	\$ 52,172.26	\$ 24,336.94	46.65%
Emerging Markets	\$ 109,415.47	\$ 18,426.24	16.84%
Japan	\$ 156,071.83	\$ 1,719.90	1.10%
Global	\$ 1,484,108.27	\$ 1,000,884.77	67.44%

The Magnitude of R&D Expenses

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<i>Highest R&D spenders</i>			<i>Lowest R&D spenders</i>		
<i>Industry Name</i>	<i>R&D - LTM (in \$ millions)</i>	<i>Current R&D as % of Revenue</i>	<i>Industry Name</i>	<i>R&D - LTM (in \$ millions)</i>	<i>Current R&D as % of Revenue</i>
Drugs (Biotechnology)	\$ 75,091.63	39.62%	Beverage (Alcoholic)	\$ -	0.00%
Drugs (Pharmaceutical)	\$ 80,658.49	23.08%	Food Wholesalers	\$ 0.88	0.00%
Software (Internet)	\$ 4,177.58	18.98%	Homebuilding	\$ -	0.00%
Semiconductor	\$ 50,321.60	17.40%	Hospitals/Healthcare Facilities	\$ 9.72	0.00%
Software (System & Application)	\$ 72,267.59	16.70%	Insurance (Life)	\$ -	0.00%
Software (Entertainment)	\$ 58,245.69	15.15%	Insurance (Prop/Cas.)	\$ -	0.00%
Telecom. Equipment	\$ 13,613.55	13.27%	Oil/Gas Distribution	\$ -	0.00%
Retail (Online)	\$ 54,214.00	10.09%	Real Estate (Development)	\$ -	0.00%
Semiconductor Equip	\$ 6,707.74	9.38%	Real Estate (General/Diversified)	\$ -	0.00%
Healthcare Products	\$ 14,934.42	8.01%	Restaurant/Dining	\$ 8.82	0.00%

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....

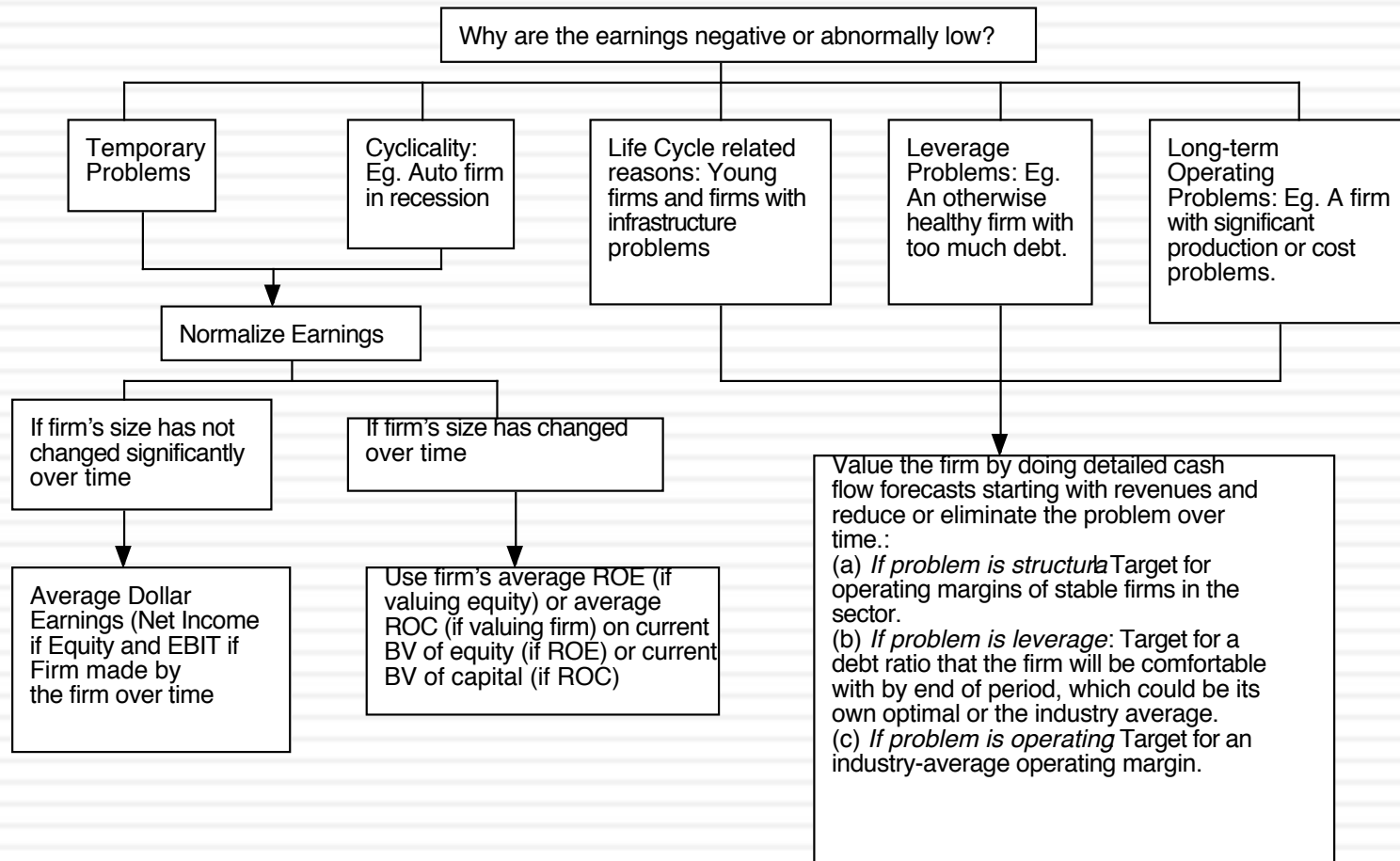
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- Though all firms may be governed by the same accounting standards, the fidelity that they show to these standards can vary. More aggressive firms will show higher earnings than more conservative firms.
- While you will not be able to catch outright 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 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			