

Financial Statement Analysis

“The raw data for investing”

Questions we would like answered...

Assets		Liabilities	
<p>What are the assets in place? How valuable are these assets? How risky are these assets?</p>	Assets in Place	Debt	<p>What is the value of the debt? How risky is the debt?</p>
<p>What are the growth assets? How valuable are these assets?</p>	Growth Assets	Equity	<p>What is the value of the equity? How risky is the equity?</p>

Basic Financial Statements

- The balance sheet, which summarizes what a firm owns and owes at a point in time.
- The income statement, which reports on how much a firm earned in the period of analysis
- The statement of cash flows, which reports on cash inflows and outflows to the firm during the period of analysis

The Accounting Balance Sheet

Figure 4.1: The Balance Sheet

Assets		Liabilities	
Long Lived Real Assets	Fixed Assets	Current Liabilities	Short-term liabilities of the firm
Short-lived Assets	Current Assets	Debt	Debt obligations of firm
Investments in securities & assets of other firms	Financial Investments	Other Liabilities	Other long-term obligations
Assets which are not physical, like patents & trademarks	Intangible Assets	Equity	Equity investment in firm

Principles underlying accounting balance sheets

- *An Abiding Belief in Book Value as the Best Estimate of Value:* Unless a substantial reason is given to do otherwise, accountants view the historical cost as the best estimate of the value of an asset.
- *A Distrust of Market or Estimated Value:* The market price of an asset is often viewed as both much too volatile and too easily manipulated to be used as an estimate of value for an asset. This suspicion runs even deeper when values are estimated for an asset based upon expected future cash flows.
- *A Preference for under estimating value rather than over estimating it:* When there is more than one approach to valuing an asset, accounting convention takes the view that the more conservative (lower) estimate of value should be used rather than the less conservative (higher) estimate of value.

Measuring asset value

- Since accounting statements, at least as structured now, begin with the historical cost at which assets were acquired and financing raised, they are not designed to measure the current value of assets.
- The only assets that are reported at or close to market value, at most companies today, are current assets. There are a handful of sectors (such as banks) where assets are marked up to market.
- As a consequence, the liabilities and the shareholders' equity from an accounting statement are not measures of the current values of either.
- Fair value accounting, a trend in both US and international accounting, aims to bring asset values in accounting balance sheets closer to their current market values.

A Financial Balance Sheet

Assets		Liabilities	
Existing Investments Generate cashflows today Includes long lived (fixed) and short-lived (working capital) assets	Assets in Place	Debt	Fixed Claim on cash flows Little or No role in management <i>Fixed Maturity</i> <i>Tax Deductible</i>
Expected Value that will be created by future investments	Growth Assets	Equity	Residual Claim on cash flows Significant Role in management <i>Perpetual Lives</i>

The Income Statement

Figure 4.2: Income Statement

Gross revenues from sale of products or services	Revenues
Expenses associates with generating revenues	- Operating Expenses
Operating income for the period	= Operating Income
Expenses associated with borrowing and other financing	- Financial Expenses
Taxes due on taxable income	- Taxes
Earnings to Common & Preferred Equity for Current Period	= Net Income before extraordinary items
Profits and Losses not associated with operations	- (+) Extraordinary Losses (Profits)
Profits or losses associated with changes in accounting rules	- Income Changes Associated with Accounting Changes
Dividends paid to preferred stockholders	- Preferred Dividends
	= Net Income to Common Stockholders

Principles underlying accounting income statements

- **Accrual accounting**: In accrual accounting, the revenue from selling a good or service is recognized in the period in which the good is sold or the service is performed (in whole or substantially). A corresponding effort is made on the expense side to match expenses to revenues.
- Expenses are categorized into operating, financing and capital expenses.
 - **Operating expenses** are expenses that, at least in theory, provide benefits only for the current period; the cost of labor and materials expended to create products that are sold in the current period is a good example.
 - **Financing expenses** are expenses arising from the non-equity financing used to raise capital for the business; the most common example is interest expenses.
 - **Capital expenses** are expenses that are expected to generate benefits over multiple periods; for instance, the cost of buying land and buildings is treated as a capital expense.

Measuring accounting profitability

- Profit relative to investment: By scaling profits to the capital invested in an asset or business, you get accounting returns. It can take these forms:
 - $\text{Return on equity} = \text{Net Income} / \text{Book Value of Equity}$
 - $\text{Pre-tax Return on (invested) capital} = \text{Operating Income} / (\text{Book Value of Equity} + \text{Book Value of Debt} - \text{Cash})$
- Profit, relative to revenues: By scaling profits to revenues, you can arrive at profit margins. Again, it can take two forms:
 - $\text{Net Margin} = \text{Net Profit} / \text{Revenues}$
 - $\text{Operating Margin} = \text{Operating Income} / \text{Revenues}$
- Both return on capital and operating margin can also be computed in after-tax terms, by multiplying each by $(1 - \text{tax rate})$

Measuring financial leverage

- Debt, relative to equity and capital: The debt due in a business can be scaled to either the equity in the business or the total capital (debt plus equity).
 - Debt/ Equity Ratio = Debt/ Equity
 - Debt/Capital Ratio = Debt/ (Debt + Equity)Both ratios can be computed in book value or market value terms.
- Debt obligations, relative to cash flows and earnings: The financial leverage burden can also be stated in terms of total debt or debt payments each period:
 - Debt/EBITDA = Debt/ EBITDA
 - Interest coverage ratio = Operating Income/ Interest Expenses

Accounting inconsistencies...

- There are a few expenses that consistently are miscategorized in financial statements. In particular,
 - Operating leases are considered as operating expenses by accountants but they are really financial expenses
 - R & D expenses are considered as operating expenses by accountants but they are really capital expenses.
- The degree of discretion granted to firms on revenue recognition and extraordinary items is used to manage earnings and provide misleading pictures of profitability.

Dealing with Operating Lease Expenses

- Debt Value of Operating Leases = PV of Operating Lease Expenses at the pre-tax cost of debt
- This now creates an asset - the value of which is equal to the debt value of operating leases. This asset now has to be depreciated over time.
- Finally, the operating earnings has to be adjusted to reflect these changes:
 - Adjusted Operating Earnings = Operating Earnings + Operating Lease Expense - Depreciation on the leased asset
 - If we assume that depreciation = principal payment on the debt value of operating leases, we can use a short cut:
Adjusted Operating Earnings = Operating Earnings + Debt value of Operating leases * Cost of debt

The Effects of Capitalizing Operating Leases

- Debt : will increase, leading to an increase in debt ratios used in the cost of capital and levered beta calculation
- Operating income: will increase, since operating leases will now be before the imputed interest on the operating lease expense
- Net income: will be unaffected since it is after both operating and financial expenses anyway
- Return on Capital will generally decrease since the increase in operating income will be proportionately lower than the increase in book capital invested

R&D Expenses: Operating or Capital Expenses

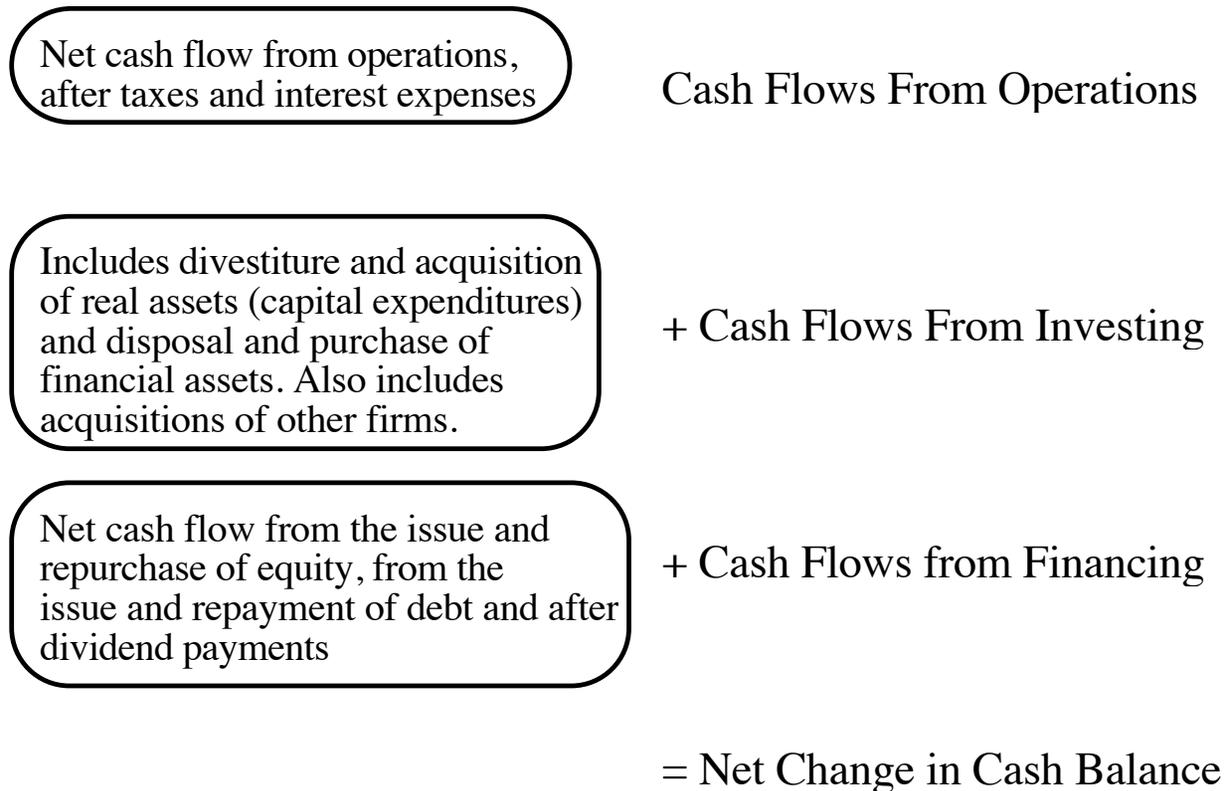
- Accounting standards require us to consider R&D as an operating expense even though it is designed to generate future growth. It is more logical to treat it as capital expenditures.
- To capitalize R&D,
 - Specify an amortizable life for R&D (2 - 10 years)
 - Collect past R&D expenses for as long as 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...:

The Effect of Capitalizing R&D

- Operating Income will generally increase, though it depends upon whether R&D is growing or not. If it is flat, there will be no effect since the amortization will offset the R&D added back. The faster R&D is growing the more operating income will be affected.
- Net income will increase proportionately, depending again upon how fast R&D is growing
- Book value of equity (and capital) will increase by the capitalized Research asset
- Capital expenditures will increase by the amount of R&D; Depreciation will increase by the amortization of the research asset; For all firms, the net cap ex will increase by the same amount as the after-tax operating income.

The Statement of Cash Flows

Figure 4.3: Statement of Cash Flows



Valuation cash flows

- In valuation, the cash flows that we compute can either be free cash flows to equity or free cash flows to all capital investors.
 - The free cash flow to equity is the cash left over, after you have made interest expenses, paid taxes and met reinvestment needs. It is also after the net cash flow from issuing debt (positive) and repaying debt (negative)
 - The free cash flow to the firm is a pre-debt cash flow, but it is after taxes (a hypothetical tax that you would have paid if you had no debt) and reinvestment needs.
- The statement of cash flows starts with net income (which makes it closer to a cash flow to equity) but it also incorporates cash flows from new equity issues and to equity investors (dividends and stock buybacks).