Chapter 2: Introduction to Financial Statements

Fundamental Question: **what do a firm's financial statements tell us about the firm?**

=> **need to understand how put together and what they tell us**

Key => **financial statements are often the best source of information about a firm**

2.1 Firm's Disclosure of Financial Information

Key issues:

=> role of financial statements
=> importance of GAAP
=> role of auditors
=> GAAP versus International Financial Reporting Standards

2.2 The Balance Sheet

Key issues:

=> items on the balance sheet: assets, liabilities, stockholder's equity, current assets, cash and marketable securities, accounts receivable, inventory, other current assets, long-term assets, accumulated depreciation, goodwill and intangible assets, amortization or impairment, current liabilities, accounts payable, short-term debt, other current liabilities, long-term liabilities, long-term debt, capital leases, deferred taxes
=> market value versus book value of equity and assets
=> value versus growth stocks

$$A = L + SE \tag{2.1}$$

=> balance sheet identity that must always hold

where:

A = assets
L = liabilities
SE = stockholders equity = difference between firm's assets and liabilities

$$MVE = SO \times MPS \quad (2.2)$$

where:

MVE = market value of equity

Note: also called market capitalization or market cap

SO = shares outstanding
MPS = market price per share

$$MB = \frac{MVE}{BVE} \quad (2.3)$$

=> ratio of value of assets to historical cost of assets
=> market value reflects expectations about future

where:

MB = market-to-book ratio
BVE = book value of equity

$$EV = MVE + D - C \quad (2.4)$$

=> value of underlying business assets of firm

where:

EV = enterprise value
D = debt
C = cash

Q: The book value of a company's assets usually does not equal the market value of those assets. What are some reasons for this difference?

Khan Academy

What it means to buy a company's stock

2.3 The Income Statement

Key issues:

=> items on income statements: sales, cost of sales, gross profit, operating expenses, operating profit, earnings before interest and taxes, pretax income, net income, earnings per share, diluted earnings per share

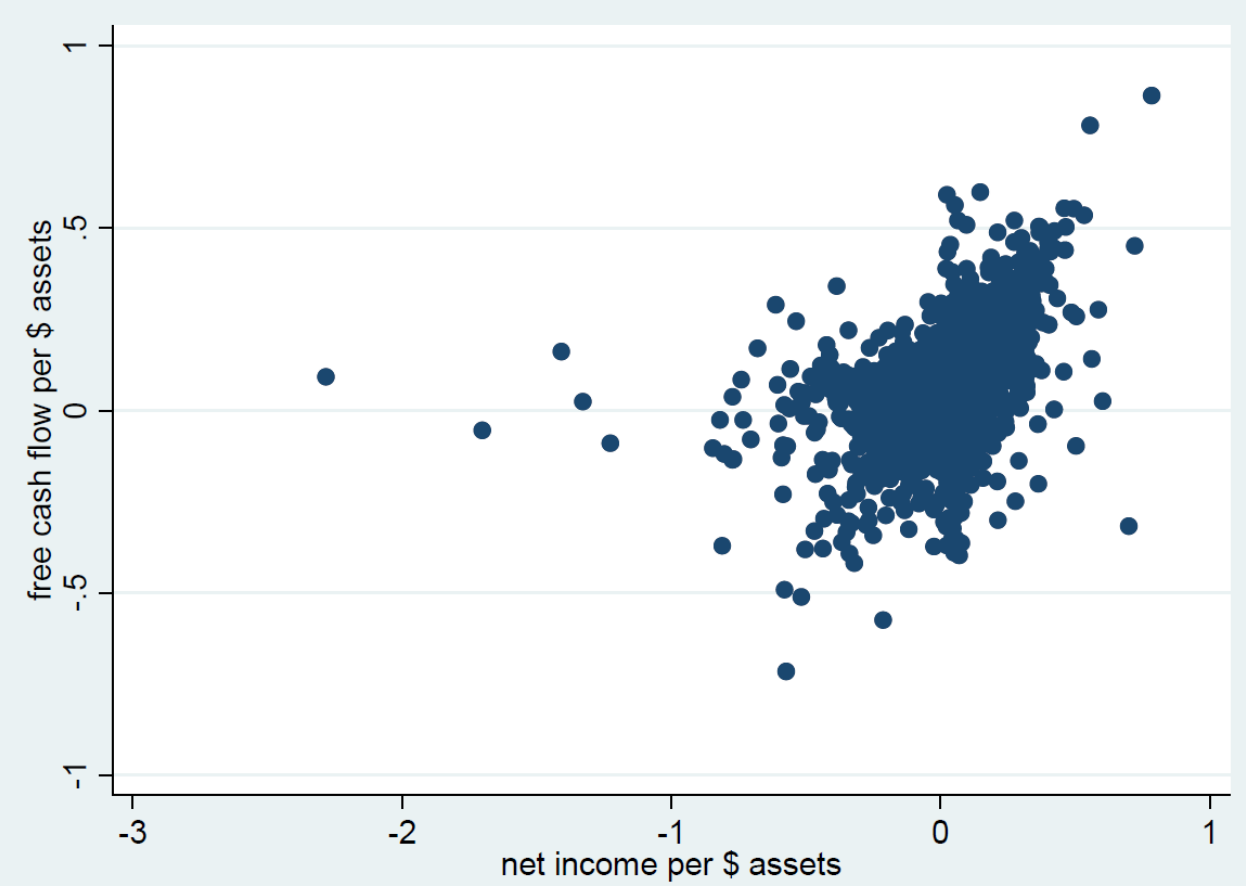
$$EPS = \frac{NI}{SO} \qquad (2.5)$$

where:

EPS = earnings per share
NI = net income

EBIT = earnings before interest and taxes

Note: income from operations is not the same as cash flow from operations. In the following graph of cash flows vs profit shows these tend to move together but not perfectly. The data I used includes all firms in the S&P 1500 for years 2010 - 2020. I divide both by total assets of the firms so the graph is not dominated by size of the firms.



Khan Academy:

Note: Khan Academy has a whole series of videos about financial statements

Videos on accounting and financial statements

2.4 The Statement of Cash Flows

Key issues:

=> reason net income does not equal cash earned (accrual vs. cash)
=> sections of statement of cash flows: operating activity, investment activity, financing activity

$$RE = NI - Div \tag{2.6}$$

=> earnings retained by firm equals earnings less dividend paid

where:

RE = retained earnings
NI = net income
Div = dividends

Q: Why does a firm's net income not correspond to cash generated by the firm?

2.5 Other Financial Statement Information

Key issues:

=> Statement of Stockholders' Equity
=> management discussion and analysis
=> off-balance sheet transactions
=> notes to the financial statements

$$CSE = NI - Div + SS - RS \tag{2.7}$$

=> earnings and sales of stock increase equity balance, dividends and repurchases reduce it

where:

CSE = change in stockholders equity
SS = sales of stock
RS = repurchases of stock

2.6 Financial Statement Analysis

Note: Ratios don't tell us much by themselves. We need to compare ratios with:

1) **similar firms to see how this firm differs from its peers**
2) **past ratios for the firm to see how changing**

=> **Trends away from the industry give clues about where to dig further.**

A. Profitability Ratios

=> useful when assessing firm's profitability

$$GM = \frac{GP}{S} \tag{2.8}$$

=> ability to sell product for more than cost of production

where:

GM = gross margin
GP = gross profit
S = sales

$$OM = \frac{OI}{S} \tag{2.9}$$

=> ability to sell product for more than cost of production costs of running the business

where:

OM = operating margin
OI = operating income = gross profit less operating expenses

$$EBITM = \frac{EBIT}{S} \quad (2.B)$$

=> ability to sell product at a profit before pay interest and taxes

where:

EBITM = EBIT margin
EBIT = earnings before interest and taxes

$$NPM = \frac{NI}{S} \quad (2.10)$$

=> fraction of revenues left for stockholders after all expenses

where:

NPM = net profit margin

B. Liquidity Ratios

=> useful when assessing firm's financial solvency or liquidity

$$CR = \frac{CA}{CL} \quad (2.C)$$

=> ability to meet short-term obligations with current assets

where:

CR = current ratio
CA = current assets
CL = current liabilities

$$QR = \frac{C+STI+AR}{CL} \quad (2.D)$$

=> ability to meet short-term obligations with "near cash" assets

where:

QR = quick ratio
STI = short-term investments
AR = accounts receivable

$$CashR = \frac{C}{CL} \tag{2.E}$$

=> ability to meet short-term obligations with cash

where:

CashR = cash ratio

C. Working Capital Ratios

=> useful when assessing how efficiently firm is using its working capital

$$ARD = \frac{AR}{ADS} \tag{2.11}$$

=> number of days to collect from customers

where:

ARD = accounts receivable days
ADS = average daily sales = sales/365

$$APD = \frac{AP}{ADCS} \tag{2.12}$$

=> number of days take to pay suppliers

where:

APD = accounts payable days
AP = accounts payable
ADCS = average daily cost of sales = cost of sales/365

$$ID = \frac{I}{ADCS} \tag{2.F}$$

=> number of days to sell inventory

where:

ID = inventory days
I = inventory

$$ART = \frac{AS}{AR} \tag{2.G}$$

=> number of times receivables turn over in a year

where:

ART = accounts receivable turnover
AS = annual sales
AR = accounts receivable

$$APT = \frac{ACOS}{AP} \tag{2.H}$$

=> number of times payables turn over in a year

where:

APT = accounts payable turnover
AP = accounts payable

$$IT = \frac{ACOS}{I} \tag{2.13}$$

=> number of times inventory turns over in a year

where:

IT = inventory turnover
ACOS = annual cost of sales

D. Interest Coverage Ratios

=> useful when assessing firm's ability to meet interest obligations

$$ICR(EBIT) = \frac{EBIT}{IE} \tag{2.I}$$

=> number of times EBIT covers interest expense

where:

ICR = interest cover ratio

Note: can be in terms of EBIT or EBITDA

IE = interest expense

$$ICR(EBITDA) = \frac{EBITDA}{IE} \quad (2.J)$$

=> number of times EBITDA covers interest expense

Note: $EBITDA = EBIT + D + A$ (2.14)

=> see p. 39 of text

=> rough measure of cash firm generates from operations
=> depreciation and amortization are typically largest non-cash expenses

where:

EBITDA = earnings before interest, taxes, depreciation and amortization
EBIT = earnings before interest and taxes
D = depreciation
A = amortization

E. Leverage Ratios

=> useful when assessing extent to which firm relies on debt financing

$$DE = \frac{TD}{TE} \quad (2.15)$$

=> ratio of debt to equity

where:

DE = debt-equity ratio
TE = total equity

Note: TE can be based on book or market values

$$DTC = \frac{TD}{TE+TD} \quad (2.16)$$

=> fraction of firm financed with debt

where:

DTC = debt-to-capital ratio

Note: TE can be based on book or market values

$$DTEV = \frac{ND}{EV} \quad (2.18)$$

=> fraction of firm financed with debt once excess cash and short-term investments used to pay off debt

where:

DTEV = debt-to-enterprise value ratio

Note: $ND = TD - ECSTI$ (2.17)

=> see p. 40 of text

=> amount of debt that would be left if firm used excess cash and marketable securities to pay off debt

where:

ND = net debt
TD = total debt
ECSTI = excess cash and short-term investments

=> excess cash & short-term investments = cash & short-term investments that firm does not need to hold to operate the firm
Note: difficult to assess "excess" from outside the firm

$$BEM = \frac{TA}{BVE} \quad (2.K)$$

=> assets per dollar of book equity

where:

BEM = book equity multiplier
TA = total assets

$$MEM = \frac{EV}{MVE} \quad (2.L)$$

=> assets per dollar of market equity

where:

MEM = market equity multiplier

F. Valuation Ratios

=> compare market value of firm to some driver of value

Market-to-Book Ratio

$$PE = \frac{MVE}{NI} \qquad (2.19a)$$

=> price stockholders pay for $1 of earnings

where:

MVE as defined in equation 2.2 above
PE = price-earnings ratio

Note: the text defines the PE ratio in terms of market capitalization, but market capitalization is the same as the market value of equity (MVE) defined earlier.

$$PE = \frac{MPS}{EPS} \qquad (2.19b)$$

=> price stockholders pay for $1 of earnings
=> same result as previous equation…just different data

Note: Text defines the PE ratio in terms of share price, but share price is the same as market price per share (MPS) defined earlier.

$$EVR = \frac{EV}{EBIT} \; or \; \frac{EV}{EBITDA} \; or \; \frac{EV}{S} \qquad (2.A)$$

=> ratio of value of underlying business assets to EBIT or EBITDA or sales

where:

EVR = enterprise value ratio

G. Operating Returns

=> useful when assessing the return on investment by the firm

$$AT = \frac{S}{TA} \qquad (2.M)$$

=> sales per dollar of assets

where:

AT = asset turnover

$$ROE = \frac{NI}{BVE} \quad (2.20)$$

=> measure of return on stockholder investment

where:

ROE = return on equity

$$ROA = \frac{NI+IE}{TA} \quad (2.21)$$

=> measure of return on investment by stockholders and bondholders

where:

ROA = return on assets
TA = total assets = book value of assets

$$ROIC = \frac{EBIT(1-T_C)}{BVE+ND} \quad (2.22)$$

=> measure of return on business' assets that is less sensitive to changes in net working capital

where:

ROIC = return on invested capital
T_c = corporate tax rate

H. The DuPont Identity

=> useful when assessing the source of return on equity

$$ROE = \frac{NI}{S} \times \frac{S}{TA} \times \frac{TA}{BVE} \quad (2.23)$$

=> DuPont Identity that breaks return on equity into three components: net profit margin, asset turnover, and equity multiplier

Khan Academy:

Note: Khan Academy has a whole series of videos on valuation including a discussion of earnings, PE ratios, EBITDA, and enterprise value

Valuation and Investing

2.7 Financial Reporting in Practice

Key issues:

=> how Enron and WorldCom inflated their earnings
=> key components of Sarbanes-Oxley
=> Bernie Madoff's fraud
=> key components of Dodd-Frank Act