Accountings: Definitions and Formulas

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1 Accounting Basics

Basic Accounting Equation:	Assets = Liabilities + Equity
Extended Accounting Equation:	Assets = Liabilities + Revenue − Expenses
Gross Profit:	Gross Profit = Revenue − Cost of Goods Sold
Operating Profit:	Op. Profit = Gross Profit − Op. Expenses
Profit Before Tax:	PBT = Operating Profit − Tax Expense
Net Profit:	Net Profit = PBT − Tax Expense

2 Accounting Measurements

2.1 Measurement Bases

Historical Cost:	The value at which assets and liabilities are acquired or produced
Amortized Cost:	Initial cost less depreciation, amortization, or impairment
Net Realizable Value (NRV):	Estimated selling price less selling costs or allowances
PV of future payments (PVFP):	The discounted value of future cash flows
Fair value (FV):	The price in an orderly transaction between market participants at the measurement date

2.2 Applications

Element	Measurement Base
Assets:	
Inventory	Lower: Historical cost or NRV
Receivables	NRV: Total receivables less allowance for bad debt
PPE	Cost model (Amortized Cost) or Revaluation model (FV- depreciation)
Investment property	Cost model or FV
Financial instruments	Historical cost, Amortized cost, or FV, depending on guidelines
Liabilities:	
Accounts Payable	Amortized cost
Borrowings	Amortized cost
Provisions	Present value of estimated future outflows
Equity:	
Common stocks	Issue price less issuance costs
Retained earnings	Accumulated earnings, less dividends [historical]

3 Accounting Ratios

3.1 Liquidity

$$\text{Current Ratio:} \quad \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Ratio:} \quad \frac{\text{Cash} + \text{Marketable Securities} + \text{Receivables}}{\text{Current Liabilities}}$$

$$\text{Cash Ratio:} \quad \frac{\text{Cash} + \text{Marketable Securities}}{\text{Current Liabilities}}$$

$$\text{Collection Period (1):} \quad \frac{\text{Accounts Receivable}}{\text{Average Daily Sales}}$$

$$\text{Days Payable (2):} \quad \frac{\text{Accounts Payable}}{\text{Average Daily Cost of Goods Sold}}$$

$$\text{Day Stocks (3):} \quad \frac{\text{Average Inventory}}{\text{Average Daily Cost of Goods Sold}}$$

$$\text{Cash cycle:} \quad (1) + (2) + (3)$$

$$\text{Working Capital:} \quad \text{Current Assets} - \text{Current Liabilities}$$

3.2 Solvency

$$\text{Debt-to-Equity:} \quad \frac{\text{Total Debt}}{\text{Total Shareholder's Equity}}$$

$$\text{Debt-to-Assets:} \quad \frac{\text{Total Debt}}{\text{Total Assets}}$$

$$\text{Financial Leverage:} \quad \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

$$\text{Interest Coverage:} \quad \frac{\text{Earnings Before Interest and Taxes}}{\text{Interest Payments}}$$

3.3 Profitability

$$\text{Gross Profit Margin:} \quad \frac{\text{Gross Profit}}{\text{Revenue}}$$

$$\text{Operating Profit Margin:} \quad \frac{\text{Operating Income (EBIT)}}{\text{Revenue}}$$

$$\text{Net Profit Margin:} \quad \frac{\text{Net Income}}{\text{Revenue}}$$

$$\text{Return on Assets (RoA):} \quad \frac{\text{EBIT}}{\text{Average Total Assets}}$$

$$\text{Return on Equity (RoE):} \quad \frac{\text{Net Income}}{\text{Average Equity}}$$

$$\text{Basics EPS:} \quad \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Weighted Av. N}^{\underline{o}}\text{. of Common Shares Outstanding}}$$

$$\text{Diluted EPS:} \quad \frac{\text{Net income - Pref. Div. + Convertible Pref. Div.+Convertible Debt Int. (1-t)}}{\text{Weighted Av. N}^{\underline{o}}\text{.of common shares outstanding (including dilutive securities)}}$$

3.4 Market Price

$$\text{Price Earnings (P/E) Ratio:} \quad \frac{\text{Share Price}}{\text{Earnings per Share (EPS)}}$$

$$\text{Dividend Yield:} \quad \frac{\text{Dividend per Share}}{\text{Current Share Price}}$$

$$\text{Retention Rate (RR):} \quad \frac{\text{Net Income} - \text{Dividends Declared}}{\text{Net Income}}$$

$$\text{Dividend Payout:} \quad \frac{\text{Dividends Declared}}{\text{Net Income}}$$

3.5 Cash Flow

$$\begin{aligned}
\text{FCFF:} &\quad \text{CFO} + [\text{Int} \times (1 - \text{Tax Rate})] - \text{FCInv} \\
\text{FCFE:} &\quad \text{CFO} - \text{FCInv} + \text{Net Borrowing} \\
\text{Cash Flow-to-Revenue:} &\quad \frac{\text{Cash Flow from Operations}}{\text{Revenue}} \\
\text{Cash Return-on-Assets:} &\quad \frac{\text{Cash Flow from Operations}}{\text{Average Total Assets}} \\
\text{Cash Return-on-Equity:} &\quad \frac{\text{Cash Flow from Operations}}{\text{Average Total Equity}}
\end{aligned}$$

3.6 Activity

$$\begin{aligned}
\text{Receivables Turnover:} &\quad \frac{\text{Annual Sales}}{\text{Average Receivables}} \\
\text{Inventory Turnover:} &\quad \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} \\
\text{Payables Turnover:} &\quad \frac{\text{Purchases}}{\text{Average Trade Payables}}
\end{aligned}$$

4 Further Definitions

4.1 Inventories

$$\begin{aligned}
\text{Ending Inventory:} &\quad \text{Beginning Inventory} + \text{Purchases} - \text{COGS} \\
\text{Cost of Goods Sold (COGS):} &\quad \text{Beginning Inv.} + \text{Purchases} - \text{Ending Inv.} \\
\text{FIFO Inventory:} &\quad \text{LIFO Inventory} + \text{LIFO Reserve}
\end{aligned}$$

4.2 Depreciation

$$\begin{aligned}
\text{Straight-line Depreciation Expense:} &\quad \frac{\text{Cost} - \text{Salvage Value}}{\text{Useful Life}} \\
\text{Ending PPE Net Book Value:} &\quad \text{Original Cost} - \text{Accumulated Depreciation} \\
\text{Average Age:} &\quad \frac{\text{Accumulated Depreciation}}{\text{Annual Depreciation Expense}} \\
\text{Remaining Useful Life:} &\quad \frac{\text{Ending PPE Net Book Value} - \text{Salvage Value}}{\text{Annual Depreciation Expense}}
\end{aligned}$$

4.3 Basic Mathematical Formulas

$$\text{Time Value of Money (PV):} \quad PV = \frac{\text{Payment}}{(1+r)^n}$$

$$\text{Compound Interest:} \quad \text{Payment} = P\left(1+\frac{r}{n}\right)^{nt}$$

$$\text{Simple Interest:} \quad \text{Payment} = P \times (1+rt)$$

$$\text{Annuity:} \quad PV = \frac{1-1/(1+r)^n}{i}$$

$$\text{Perpetuity:} \quad PV = \frac{1}{r}$$