

Accountings: Definitions and Formulas

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1 Accounting Basics

Accounting Equation: $\text{Assets} = \text{Liabilities} + \text{Equity}$
Ext. Accounting Equation: $\text{Assets}_t = \text{Liabilities}_t + \text{Revenue}_t - \text{Expenses}_t + E_{t-1}$
Gross Profit: $\text{Gross Profit} = \text{Revenue} - \text{Cost of Goods Sold}$
Operating Profit: $\text{Op. Profit} = \text{Gross Profit} - \text{Op. Expenses}$
Profit Before Tax: $\text{PBT} = \text{Operating Profit} - \text{Tax Expense}$
Net Profit: $\text{Net Profit} = \text{PBT} - \text{Tax Expense}$

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

3 Accounting Ratios

3.1 Liquidity

Current Ratio:	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$
Quick Ratio:	$\frac{\text{Cash} + \text{Marketable Securities} + \text{Receivables}}{\text{Current Liabilities}}$
Cash Ratio:	$\frac{\text{Cash and cash equivalent}}{\text{Total Assets}}$
Collection Period (1):	$\frac{\text{Accounts Receivable}}{\text{Average Daily Sales}}$
Days Payable (2):	$\frac{\text{Accounts Payable}}{\text{Average Daily Cost of Goods Sold}}$
Day Stocks (3):	$\frac{\text{Average Inventory}}{\text{Average Daily Cost of Goods Sold}}$
Cash cycle:	$(1) + (2) + (3)$
Working Capital:	$\text{Current Assets} - \text{Current Liabilities}$

3.2 Solvency

$$\begin{aligned}
 \text{Debt-to-Equity:} & \quad \frac{\text{Total Debt}}{\text{Total Shareholder's Equity}} \\
 \text{Debt-to-Assets:} & \quad \frac{\text{Total Debt}}{\text{Total Assets}} \\
 \text{Financial Leverage:} & \quad \frac{\text{Total Liabilities}}{\text{Total Assets}} \\
 \text{Interest Coverage:} & \quad \frac{\text{Earnings Before Interest and Taxes}}{\text{Interest Payments}}
 \end{aligned}$$

3.3 Profitability

$$\begin{aligned}
 \text{Gross Profit Margin:} & \quad \frac{\text{Gross Profit}}{\text{Revenue}} \\
 \text{Operating Profit Margin:} & \quad \frac{\text{Operating Income (EBIT)}}{\text{Revenue}} \\
 \text{Net Profit Margin:} & \quad \frac{\text{Net Income}}{\text{Revenue}} \\
 \text{Return on Assets (RoA):} & \quad \frac{\text{EBIT}}{\text{Average Total Assets}} \\
 \text{Return on Equity (RoE):} & \quad \frac{\text{Net Income}}{\text{Average Equity}} \\
 \text{Basics EPS:} & \quad \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Weighted Av. N}^{\circ} \text{ of Common Shares Outstanding}} \\
 \text{Diluted EPS:} & \quad \frac{\text{Net income} - \text{Pref. Div.} + \text{Convertible Pref. Div.} + \text{Convertible Debt Int. (1-t)}}{\text{Weighted Av. N}^{\circ} \text{ of common shares outstanding (including dilutive securities)}}
 \end{aligned}$$

3.4 Market Price

$$\begin{aligned}
 \text{Price Earnings (P/E) Ratio:} & \quad \frac{\text{Share Price}}{\text{Earnings per Share (EPS)}} \\
 \text{Dividend Yield:} & \quad \frac{\text{Dividend per Share}}{\text{Current Share Price}} \\
 \text{Retention Rate (RR):} & \quad \frac{\text{Net Income} - \text{Dividends Declared}}{\text{Net Income}} \\
 \text{Dividend Payout:} & \quad \frac{\text{Dividends Declared}}{\text{Net Income}}
 \end{aligned}$$

3.5 Cash Flow

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

3.6 Activity

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

4 Further Definitions

4.1 Inventories

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

4.2 Depreciation

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

4.3 Basic Mathematical Formulas

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

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

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

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

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