A: Assets, D: Debt, E: Equity, NWC: Net Working Capital, R: Revenue

Basics

Assets = Debt(Liabilities) + Equity ⋯ $\iff$ A = D + E

Income = Revenue - Expenses

Net Working Capital = (Current Assets) - (Current Liabilities) ⋯ $\iff$ NWC = CA - CL

CashFlow(Assets) = CashFlow(Creditors) + CashFlow(Stockholders) ⋯ $\iff$ CF(A) = CF(B) + CF(S)

Operating Cashflow = (Net Income) + Depreciation + (ΔNWC) ⋯ $\iff$ OCF = EBIT + Depreciation - Taxes

Liquidity Ratios

Current Ratio = (Current Assets)/(Current Liabilities) ⋯ $\iff$ CR = CA/CL

Quick Ratio = (Current Assets - Inventory)/(Current Liabilities) ⋯ $\iff$ CR = (CA - Inv)/CL

Cash Ratio = Cash/(Current Liabilities) ⋯ $\iff$ Cash/CL

Leverage Ratios

Total Debt Ratio = (Assets - Equity)/Assets ⋯ $\iff$ TDR = (A - E)/A

Debt/Equity Ratio = Debt/Equity ⋯ $\iff$ D/E

Equity Mulitplier = Assets/Equity $\iff$ 1 + Debt/Equity ⋯ $\iff$ EM = A/E $\iff$ 1 + D/E

Coverage Ratios

Times Interest Earned = (Earnings Before Interest and Taxes)/Interst ⋯ $\iff$ TIE = EBIT/Interest

Cash Coverage = (EBIT + Depreciation + Amortization)/Interest

Ratio Analysis

Inventory Turnover = Cost of Goods Sold/Inventory ⋯ $\iff$ IT = COGS/Inventory

Days' Sales in Inventory = 365/(Inventory Turnover) ⋯ $\iff$ DSI = 365/IT

Receivables Ratios

Receivables Turnover = Sales/(Accounts Receivable) ⋯ $\iff$ RT = S/AR

Days' Sales in Receivables = 365/(Receivables Turnover) ⋯ $\iff$ DSR = 365/RT

Total Asset Turnover = Sales/(Total Assets) ⋯ $\iff$ TAT = S/A

Profitability Ratios

Profit Margin = (Net Income)/Sales ⋯ $\iff$ PM = NI/S

Return on Assets = (Net Income)/(Total Assets) ⋯ $\iff$ ROA = NI/A

Return on Equity = (Net Income)/(Total Equity) ⋯ $\iff$ ROE = NI/E

Market Value Measures

Earnings Per Share = (Net Income)/(Shares Outstanding) ⋯ $\iff$ EPS = NI/SO

Price-to-Earnings Ratio = (Price per Share)/(Earnings per Share) ⋯ $\iff$ PE Ratio = PPS/EPS

Market Capitalization = (PPS)·(Shares Outstanding)

Dividend Ratios

Dividend Payout Ratio = (Dividends Paid)/Net Income = d

Retention Ratio = 1 - (Dividends Paid)/Net Income ⋯ $\iff$ $b = 1 - d$

Du-Pont Identity

ROE = $\frac{NI}{S} \cdot \frac{S}{A} \cdot \frac{A}{E}$ ⋯ $\iff$ ROE = PM·TAT·EM

Pro Forma Income Statement for year n

(Projected) $\text{Sales}_n = \text{Sales}_{n-1}\cdot(1 + \text{Growth Rate})$

(Projected) $(\text{Cost of Goods Sold})_n = (\text{Cost of Goods Sold})_{n-1}\cdot(1 + \text{Growth Rate})$

(Projected) $(\text{Taxable Income})_n = \text{Sales}_n - \text{Costs}_n - \text{Interest}_n$

(Projected) $\text{Interest}_n = \text{Interest}_{n-1} + (\text{Interest Rate})\cdot\text{D}$

(Projected) $\text{Taxes}_n = (\text{Tax Rate})\cdot(\text{Taxable Income})_n$

(Projected) $(\text{Net Income})_n = (\text{Taxable Income}_n) - \text{Taxes}_n$

(Projected) $\text{Dividends}_n = (\text{Net Income})_n\cdot(\text{Dividend Payout Ratio})$

(Projected) $(\text{Addition to Retained Earnings})_n = (\text{Net Income}_n) - \text{Dividends}_n = (\Delta\text{Retained Earnings})$

Pro Forma Balance Sheet for year n

(Projected) $\text{Cash}_n = \text{Cash}_{n-1}\cdot(1 + \text{Growth Rate})$

(Projected) $(\text{Accounts Receivable})_n = (\text{Accounts Receivable})_{n-1}\cdot(1 + \text{Growth Rate})$

(Projected) $\text{Inventory}_n = \text{Inventory}_{n-1}\cdot(1 + \text{Growth Rate})$

(Projected) $(\text{Net Fixed Assets})_n = (\text{Net Fixed Assets})_{n-1}\cdot(1 + \text{Growth Rate})$

(Projected) $(\text{Accounts Payable})_n = (\text{Accounts Payable})_{n-1}\cdot(1 + \text{Growth Rate})$

(Projected) $(\text{Notes Payable})_n = (\text{Notes Payable})_{n-1} + \text{D}$

(Projected) $(\text{Long Term Debt})_n = (\text{Long Term Debt})_{n-1} + \text{D}$

(Projected) $(\text{Stock})_n = (\text{Stock})_{n-1} - (\text{Buy Backs})$

(Projected) $(\text{Retained Earnings})_n = (\text{Retained Earnings})_{n-1} + \Delta\text{Retained Earnings}$

Solve for D *by setting Total Assets = Total Liabilities*

External Financing Needed (EFN)

EFN = (Projected Total Assets) - (Spontaneous ΔLiabilities) - (ΔRetained Earnings)

EFN > 0 ? "External financing needed" : "Company has excess funds"

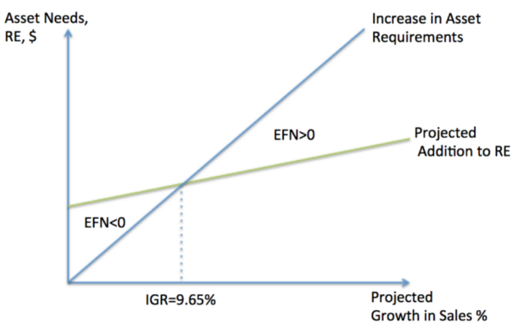
Growth Rate

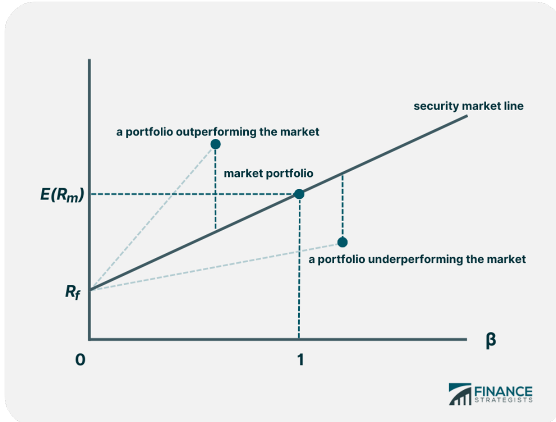
Internal Groth Rate = (ROA·b)/(1 - ROA·b) = IGR

Sustainable Groth Rate = (ROE·b)/(1 - ROE·b) = SGR

Capital Budgeting: Evaluating and selecting long-term investments.

Capital Structure Mix of debt and equity to finance operations.
Net Working Capital: Reflects short-term financial health. NWC > 0 ? Usually good : Usually bad.
Internal Growth Rate: Maximum growth rate *without* EFN.
Sustainable Growth Rate: Maximum growth rate *without* EFN *and* maintaining a constant debt/equity ratio.
SGR $<$ IGR $\implies$ The company has some shit internal growth management. Change dividend policy, $\uparrow$ efficiency, $\uparrow$ profitability. No EFN.
SGR $=$ IGR $\implies$ The company is able to finance its growth solely through retained earnings and doesn't need EFN.
SGR $>$ IGR $\implies$ The company can grow faster than internal financing alone. We can use EFN.
EFN (again) $= \frac{\text{Assets}-(\text{Spontaneous Liabilities})}{\text{Sales}} \cdot \Delta\text{Sales} - ([\text{Profit Margin}] \cdot [\text{Projected Sales}]) \cdot (1-d)$





Present Value
Single cashflow: $\text{PV} = \frac{C_0}{(1+r)^t}$
Annuity: $\text{PV} = \frac{C_0}{r}\left[1 - \frac{1}{(1+r)^t}\right]$; Annuity Due: $\text{PV} = \frac{C_0}{r}\left(1 - \frac{1}{(1+r)^t}\right)(1+r)$; Growing Annuity: $\text{PV} = \frac{C_0}{r-g}\left[1 - \left(\frac{1+g}{1+r}\right)^t\right]$
Perpetuity: $\text{PV} = \frac{C_0}{r}$; Growing Perpetuity: $\text{PV} = \frac{C_0}{r-g}$
Future Value
Single cashflow: $\text{FV} = C_0\left(1+r\right)^t$
Annuity: $\text{FV} = \frac{C_0}{r}\left((1+r)^t - 1\right)$; Annuity Due: $\text{FV} = \frac{C_0}{r}\left((1+r)^t - 1\right)(1+r)$; Growing Annuity: $\text{FV} = \frac{C_0}{r-g}\left[(1+r)^t - (1+g)^t\right]$
Compounding Periods: $\text{FV} = C_0\left(1+\frac{r}{m}\right)^{mt}$; Continuous Compounding: $\text{FV} = C_0 e^{rt}$ Effective Annual Rate: $\text{FV} = C_0\left(1+EAR\right)^t$

Capital Budgeting Net Present Value $\text{NPV} = -C_0 + \sum_{t=1}^{n} \frac{C_t}{(1+r)^t}$
$0 <$ NPV ? accept since we have made more than the discount rate (r) would have made on its own.
Discounted/Payback Period How long does it take to pay back the initial cost? Discounted $\implies$ Use the discounted rates.
CAPM Expected return based on systematic risk
$r_i = r_f + \beta_i\left(r_m - r_f\right)$ where r_f: risk free rate; β_i: systematic risk of security i; r_m: expected return of mkt; $r_m - r_f$: mkt risk premium
$\uparrow$Systematic Risk (β_i) $\implies \uparrow$Expected Return (r_i)
Cashflow Metrics
Sunk Cost: Irreversable past expenses
Opportunity Cost: Potential benefit lost when weighing projects
Salvage Value = (Market Value) - t [(Market Value) - (Book Value)]
Bonds Face Value: Amount promised at the end of period (constant)
Years To Maturity: Time to maturity; time until face value is paid
PV of Coupon Payments: $\text{PV} = \frac{C}{r}\left[1 - \frac{1}{(1+r)^t}\right]$
PV of Face Value: $\text{PV} = \frac{F}{(1+r)^t}$
Bond Value = (PV of Coupon Payments) + (PV of Face Value) .... $\iff$ Bond Value $= \frac{C}{r}\left[1 - \frac{1}{(1+r)^t}\right] + \frac{F}{(1+r)^t}$
Current Yield $= \frac{\text{Annual Coupon Payment}}{\text{Current Bond Price}}$
Interest Rate Risk: $\uparrow$Interest Rate $\implies \downarrow$Bond Value
Maturity: $\uparrow$Years to Maturity $\implies$ Sensitive to Interest Rate changes
Coupon Rate: $\downarrow$Coupon Rate $\implies$ Sensitive to Interest Rate changes
Discount/Premium/Par Bond: Bond sells for *less/more/same* than face value and YTM *greater/less/same* than the coupon rate
Capital Gains Yield = YTM - (Current Yield)
Yield Curve: Positive Slope ? Normal : Recession
Stock Valuation Dividend Discount Model: $P_0 = \sum_{t=1}^{\infty} \frac{\text{Div}_t}{(1+r)^t}$
Perpetuity: $P_0 = \frac{\text{Div}}{r}$
Growing $P_0 = \frac{\text{Div}}{r-g}$
Arithmetic Return: $\frac{\sum \text{Returns}}{\text{number of periods}}$; Geometric Return: $\sqrt[n]{\prod_{t=1}^{n}\left(1+\text{Return}_t\right)^{\frac{1}{\text{number of periods}}}} - 1$
Portfolio Variance: $\sigma_p^2 = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2\sigma_{12}^2$ where $\sigma_{12} = \rho_{12}\sigma_1\sigma_2$; Derivative: $\frac{\partial\sigma_p^2}{\partial w_1} = 2w_1\sigma_1^2 - 2(1-w_1)\sigma_2^2 + 2\sigma_{12} - 2w_1\sigma_{12}$