

<p>Legend Key for TVM Formulae</p> <p>r = required rate of return, interest or discount rate per period n = number of periods C = periodic cash flow payment g = periodic growth rate</p>	<p>Future Value - Regular Annuity</p> $FV = C \times \left[\frac{(1+r)^n - 1}{r} \right]$
<p>Future Value Lump Sum - Simple Interest</p> $FV = PV(1+nr)$	<p>Present Value - Regular Annuity</p> $PV = C \times \left[\frac{1 - \frac{1}{(1+r)^n}}{r} \right]$
<p>Future Value Lump Sum - Compound Interest</p> $FV = PV(1+r)^n$	<p>Present Value - Annuity Due</p> $PV_D = C \times \left[\frac{1 - \frac{1}{(1+r)^n}}{r} \right] (1+r)$
<p>Present Value Lump Sum - Compound Interest</p> $PV = \frac{FV}{(1+r)^n}$	<p>Future Value - Annuity Due</p> $FV_D = FV_{RegularAnn}(1+r)$
<p>Present Value of a Perpetual Annuity</p> $PV = \frac{AnnuityPayment}{r}$	<p>Future Value - Annuity Due</p> $FV_D = C \times \left[\frac{(1+r)^n - 1}{r} \right] (1+r)$
<p>Effective Annual Rate of Interest</p> $EAR = \left[1 + \frac{i}{n} \right]^n - 1$ <p>i = quoted annual percentage rate & n = number of compounding periods per year.</p>	<p>Present Value of a Finite Growing Annuity</p> $PV = \frac{C}{r-g} \left[1 - \left(\frac{1+g}{1+r} \right)^n \right]$
<p>Periodic Rate of Interest</p> $r = \left[1 + \frac{i}{m} \right]^{m/f} - 1 \quad \text{or} \quad r = [1 + EAR]^{1/n} - 1$ <p>i = quoted annual percentage rate, m = compounding frequency of quoted rate, f = frequency of compounding of required periodic rate & n = number of compounding periods per year.</p>	<p>Effective Annual Rate - Continuous Compounding</p> $EAR = e^q - 1$ <p>q = quoted rate $e = 2.718281828$</p>
<p>Annual Periodic Rate of Interest</p> $APR = n \left([1 + EAR]^{1/n} - 1 \right)$	<p>Price of Preferred Shares</p> $P_0 = \frac{D}{r}$

<p>Price of Common Shares</p> $P_0 = \frac{D_1}{r - g}$	<p>Stock Price after committed new growth projects</p> $P_0 = \frac{EPS}{r} + NPVGO$
<p>Current Bond Yield</p> $\text{Current Yield} = \frac{\text{Annual Interest Payment}}{\text{Current Bond Price}}$	<p>Bond Price</p> $B = C \times \left[\frac{1 - \frac{1}{(1+r)^n}}{r} \right] + \frac{\text{Face Value}}{(1+r)^n}$
<p>Fisher Effect - Real Rate of Return</p> $1 + R = (1 + r) \times (1 + \text{inflation rate})$ <p><i>R = nominal rate of return</i> <i>r = real rate of return</i></p>	<p>Total Dollar Return (TDR) = Dividend Income + Capital Gain/(Loss)</p> $TDR = \frac{CF_t + (P_E - P_B)}{P_B} = \frac{CF_t + PC}{P_B}$
<p>Expected Return (in general)</p> $E(R) = \sum_j O_j \times P_j$	<p>Expected Portfolio Return (in general)</p> $E(R_p) = x_1 \times E(R_1) + x_2 \times E(R_2) + \dots + x_n \times E(R_n)$
<p>Standard Deviation of a 2 Stock Portfolio</p> $\sigma_P = \sqrt{x_L^2 \sigma_L^2 + x_U^2 \sigma_U^2 + 2x_L x_U \sigma_{LU}}$	<p>Variance of returns (in general)</p> $= \sigma^2 = \sum_j [O_j - E(R)]^2 \times P_j$
<p>Covariance of 2 Securities</p> $\sigma_{ij} = CORR_{i,j} \sigma_i \sigma_j$	<p>Standard Deviation of a 2 Security Portfolio</p> $\sigma_P = \sqrt{x_L^2 \sigma_L^2 + x_U^2 \sigma_U^2 + 2x_L x_U CORR_{L,U} \sigma_L \sigma_U}$
<p>Beta of a Stock</p> $\beta_A = \frac{COV(R_A, R_M)}{\sigma^2(R_M)} \quad \text{OR} \quad \beta_A = \frac{CORR_{L,Mkt} \sigma_L \sigma_{Mkt}}{\sigma^2(R_{Mkt})}$	<p>Historical Variance</p> $\sigma^2 = \frac{[(R_1 - \bar{R})^2 + \dots + (R_T - \bar{R})^2]}{T - 1}$
<p>Capital Asset Pricing Model</p> $E(R_i) = r_f + [E(R_M) - r_f] \beta_i$	<p>Profitability Index = $\frac{\text{Present value of cash inflows}}{\text{Present value of cash outflows}}$</p>
<p>Arbitrage Pricing Theory</p> $E(R) = R_f + \beta_1 [E(R_1) - R_f] + \beta_2 [E(R_2) - R_f] + \dots + \beta_n [E(R_n) - R_f]$	<p>PV of CCA tax shield</p> $= \frac{CdT}{(d+k)} \left[\frac{1 + 0.5 \times k}{1+k} \right] - \left[\frac{S_n dT}{(d+k)} \right] \left(\frac{1}{(1+k)^n} \right)$ <p><i>d = CCA rate, T = tax rate, k = cost of capital or required rate of return & S = salvage value.</i></p>

Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

Total Asset Turnover = $\frac{\text{Sales}}{\text{Total Assets}}$

Inventory Turnover = $\frac{\text{COGS}}{\text{Inventory}}$

ROE = $\frac{\text{Net Income}}{\text{Total Equity}}$

Corporate Finance Formula Sheet

September-13

Quick Ratio	= $\frac{\text{Current Assets}-\text{Inventory}}{\text{Current Liabilities}}$	ROA	= $\frac{\text{Net Income}}{\text{Total Assets}}$
Cash Ratio	= $\frac{\text{Cash}}{\text{Current Liabilities}}$	P/E Ratio	= $\frac{\text{Price}/\text{common share}}{\text{EPS}}$
Receivables Turnover	= $\frac{\text{Sales}}{\text{Accounts Receivable}}$	Dividend Payout Ratio	= $\frac{\text{DPS}}{\text{EPS}}$
D/E Ratio	= $\frac{\text{Total Debt}}{\text{Total Equity}}$	Dividend Payout Ratio	= $\frac{\text{Cash Dividends}}{\text{Net Income}}$
Total Debt Ratio	= $\frac{\text{Total Debt}}{\text{Total Assets}}$	Market to Book Ratio	= $\frac{\text{Price} / \text{Common share}}{\text{Book value of equity}}$
Equity multiplier	= $\frac{\text{Total Assets}}{\text{Total Equity}}$	Profit Margin	= $\frac{\text{Net Income}}{\text{Sales}}$
Net Working Capital to Total Assets	= $\frac{\text{Net Working Capital}}{\text{Total Assets}}$	Interval Measure	= $\frac{\text{Current Assets}}{\text{Average Daily Operating Costs}}$
Long Term Debt Ratio	= $\frac{\text{Long Term Debt}}{\text{Total Equity} + \text{LT Debt}}$	Cash Coverage Ratio	= $\frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$
Days' Sales in Receivables	= $\frac{365 \text{ Days}}{\text{Receivables Turnover}}$	Days' Sales in Inventory	= $\frac{365 \text{ Days}}{\text{Inventory Turnover}}$
Internal Growth Rate	= $\frac{\text{ROA} \times R}{1 - \text{ROA} \times R}$	Sustainable Growth Rate	= $\frac{\text{ROE} \times R}{1 - \text{ROE} \times R}$
NWC Turnover	= $\frac{\text{Sales}}{\text{NWC}}$	Sustainable Growth Rate	= $\frac{p(S/A)(1+D/E) \times R}{1 - p(S/A)(1+D/E) \times R}$
Times Interest Earned	= $\frac{\text{EBIT}}{\text{Interest Charges}}$	Fixed Asset Turnover	= $\frac{\text{Sales}}{\text{Net Fixed Assets}}$

Du Pont Identity $\text{ROE} = \text{Profit Margin} \times \text{Total Asset Turnover} \times \text{Equity Multiplier}$

Cash Flow Identity

CF from Assets = Operating CF – Cap Ex – Additions to Net Working Capital

Operating CF = EBIT + Depreciation – Tax

= Sales – Costs – Taxes

= (Sales – Costs) x (1 – Tax rate) + Depreciation x Tax rate

Cap Ex = End Gross Fixed Assets – Beg Gross Fixed Assets

Cap Ex = End Net FA – Beg Net FA + Depreciation

Additions to NWC = End NWC – Beg NWC

CF to Debt holders = Interest – Net New Debt

CF to Shareholders = Dividends – Net New Equity

CF from Assets = CF to Debt holders + CF to Shareholders