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Financial Ratios & Formulas

Ratio	Formula
Financial Statement Formulas	
Accounting Equation, aka Balance Sheet Equation	Assets = Liabilities + Shareholders' Equity
Income Statement: Retail	Net Revenues - Cost of Goods Sold = Gross Profit/Margin - Operating Expenses = Operating Income - Non-Operating Income, Expenses, Gains, & Losses = Net Income before tax - Tax = Net Income
Statement of Retained Earnings	Retained Earnings, beginning balance +/- Prior Period Adjustment +/- Change in Accounting Principle = Retained Earnings, adjusted balance + Net Income - Dividends declared = Retained Earnings, ending balance
Statement of Shareholders' Equity	Shareholders' Equity, beginning balance + additional equity issuance +/- change in Retained Earnings = Shareholder's Equity, ending balance
Statement of Cash Flows	Cash flows from Operating Activities +/- Cash flows from Investing Activities +/- Cash flows from Financing Activities = change in Cash balance
Market Performance Ratios	
Earnings per share	(Net Income - Pref Stk dividends) / Shares outstanding
Price to earnings ratio	Market share price / Earnings per share
Enterprise value	Market capitalization + Interest Bearing Debt - Cash
Enterprise value multiplier	Enterprise value / Earnings before interest + taxes
Market to Book Ratio	Market value per share / Book value per share
Market Capitalization	Market price per share X Shares outstanding
Return on Common Equity	Net income / Common equity
Return on investment	Net Income + Interest X (1 - tax rate) / (Equity + long-term debt)
Return on owner's equity	Net income /Average Owner's Equity
Return on Total Assets	Net Income + Interest X (1 - tax rate) / Total assets
Dupont formula	Net Income/Equity = (Net Income/Sales) X (Sales/Assets) X (Assets/Equity)
Dupont formula	States that ROE can be computed as: Profit margin X Total asset turnover X Equity Multiplier
Economic Value Added (EVA)	EBIT X (1 - t) - WACC X Capital Invested OR Equity X (ROE - Ke)

Profitability Ratios	
Gross profit margin	Gross Profit / Net Sales or Revenues
Net Profit margin	Net Income after tax / Net Sales
Operating profit margin	Operating profit / Net Sales
EBIT return on Assets (EROA)	EBIT / Average Total Assets
Pre-tax Income to Sales	Pretax income / Net sales
Pre-tax return on assets	Pretax income / Total assets
Pre-tax return on common equity	Pre-tax / Common equity
Return on Assets	Net Income / Total Assets
Return on Equity	Net income / Average Total Equity **OR** (Net Income/Sales) (Sales/Assets) (Assets/Equity)
Asset Utilization / Turnover Ratios	
Total asset turnover	Net Sales / Average Total Assets
Accounts Receivables turnover	Net Sales / Average Accounts Receivable
Average Collection Period	365 days/Receivables turnover ratio
Inventory turnover	Cost of Goods Sold / Average Inventory
Days sales in payables	Average Accounts and Expenses Payable /(Operating expenses / 365)
Days sales in inventory	365 days / Inventory turnover ratio
Debt-free Working Capital Turnover	Sales / Debt-free Working Capital
Capital intensity	Average Total assets /Net Sales
Working capital turnover	Sales / (Current assets - current liabilities)
Short-term Solvency / Liquidity Ratios	
Cash	Cash / Average Current Liabilities
Current cash debt coverage	Net Cash Provided by Operating Activities / Average Current Liabilities
Current ratio	Current Assets / Current Liabilities
Quick or Asset Test ratio	Quick Assets (Cash & equivalents + S-T investments + Receivables)/ Current Liabilities
Interest-bearing Debt to Equity	Interest-bearing debt / Total equity
Dividend payout	Dividends Per Share/ Earnings per Share
Dividend payout ratio	Dividends Paid / Net Income
Net Cash Flow from Operating Activities (NCFOA)	Net Income + Depreciation and Amortization
Rule of 72	Time to Double Your Money = 72/interest rate
Working capital	Total Current Assets - Total Current Liabilities
Debt Ratios	
Total debt to total assets	Total Liabilities / Total assets
Total debt to total equity	Total Liabilities / Total Equity
Total equity to total assets	Total equity / Total assets

Equity Multiplier	Total Assets / Total Equity
Long-term debt to equity	Long-term Liabilities / Total Equity
Times interest earned aka Interest coverage ratio	Operating income* / Interest expense
Cash coverage	Operating income* + depreciation + amortization / Interest
Fixed charge coverage	(Net Income before taxes + Interest charges + long-term lease payments) / (Interest charges + Long-term lease payments)
Time value of money formulas	
Lower case letters (pv & fv) denote present and future values of $1 (a lump sum)	present value of $1 (lump sum) pv = fv (*factor*) n, *i*
	future value of $1 (lump sum) fv = pv *(factor)* n, *i*
CAPITAL letters (PV & FV) denote Present & Future values of an Annuity (a series of payments)	Present Value of Annuity (ordinary) PV = Payment *(Factor)* n, *i*
	Future Value of Annuity (ordinary) FV = Payment *(Factor)* n, *i*
An Annuity Due has the word "Due" as a subscript to the word Annuity	Present Value of an $\text{Annuity}_{\text{Due}}$ PV_{Due} = Payment *(Factor)* n, *i*
Note: if you don't have an $\text{Annuity}_{\text{Due}}$ table, use an ordinary Annuity table & multiply the Factor by 1 + Interest rate	Future Value of an $\text{Annuity}_{\text{Due}}$ FV = Payment (Factor) n, *i* (1 + interest rate)
Management Accounting Formulas	
Profit Equation	Selling Price (# units sold) – Variable Costs (# units sold) – Total Fixed Costs
Total Contribution Margin	Contribution Margin per Unit * Units Sold
Contribution Margin per unit	Selling Price per Unit - Variable Costs per Unit
Variable Cost per Unit	Total Variable Costs / Units Sold
Contribution Margin Ratio	(Selling Price – Variable Costs) / Selling Price
Break-Even Point (BEP) in Units	Fixed Costs / Contribution Margin
Break-Even Point in $	Fixed Costs / Contribution Margin Ratio
Break Even	Total Revenues - (Total Variable Costs + Total Fixed Costs) = 0
Target Income	Selling Price (# units) – Variable Costs (# units) – Total Fixed Costs = Target income
Target Cost per Unit	((Quantity *Price) – fixed costs – profit required) / Quantity
Margin of Safety (MOS)	Actual Sales – BEP = (#units * sales price) - BEP
Martin of Safety Ratio	Actual Sales – BEP = (#units * sales price) - BEP OR Expected Sales – Break Even Sales OR Margin of Safety / Expected Sales
Overhead Rates Using One Cost Pool	Total Overhead / Total Labor Hours

Overhead Rates Using Two Cost Pools	$Rate_1$ = $Type_1$ Overhead / $Type_1$ Labor Hours OR: Rate2 = Type2 Overhead / Type2 Labor Hours
Allocating Joint Costs	Joint cost allocated to product A = [Sales value of A / (Sales value of A + Sales value of B)] x Joint Costs And: Joint cost allocated to product B = [Sales value of B / (Sales value of A + Sales value of B)] x Joint Costs
Full Price with Markup = Price + Markup	Full Price with Markup = Price + Markup Price = Variable Costs + (Fixed Costs/Unit) Market = (Markup Rate) (Price)
Profit maximizing price	Total contribution margin - Fixed Costs
Incremental Profit or Loss	Incremental Revenue – Incremental Cost
Incremental Cost per Unit	Sum of Variable Costs / units produced
Incremental Costs for Additional Units	(Incremental Cost per Unit) * Additional Units Produced
Total Budget = Total Costs	Total Variable Costs + Total Fixed Costs
Estimate of Variable Cost	Change in Cost / Change in Activity
Estimate of Variable Cost	(Cost at its highest level of Activity - Cost at its lowest level of
Estimate of the total cost for a given activity level	Total cost = Fixed cost + (Variable cost per unit x Activity level in units)
Finance Formulas	
Rule of 72 = time to double your money	TDM = 72 / interest rate
Present Value of $1 (lump sum)	$PV=FV^n/(1 + i)^n$
Future Value of $1 (lump sum)	$FV_n=PV \times (1 +i)^n$
Future value with compounding more than an	$FVn = PV * (1 + i/m)^{m * n}$
Future value with continuous compounding	$FV_{â^ž} = PV * e^{i * n}$
Future value with general growth rate	$FV_n = PV * (1 + g)^n$
Holding period return	HPR = [(1 + r1) (1 + r2) …(1 + rn)] - 1
Hamada equation	$\beta_L = \beta_U * [1 + (1 – T_c)*(D/S)]$
Net present value	$NPV = \sum_{t}^{T} \frac{C_t}{(1+i)^t} - C_0$
Internal rate of return	$\sum_{t=0}^{T} \frac{CF_t}{(1+IRR)^t} = 0$
Internal rate of return factor	Net Initial Investment / Annual Cash Flow
Modified Internal rate of return	$FV_{profits} = PV_{costs} (1 + MIRR)^N$

Discounted cash flow	Cash Flow/ (1 + r)^n
Beta	Bu = BL / {1 + [(1-t)(Wd/We)]} BR = Bu{1+[(1-t)(Wd/We)]}
Build-up Method	ke = Rf +(RPm) +RPs + Rpu
Capitalization rate	Discount rate - long-term growth rate
Capital Asset Pricing Model (CAPM)	$R_S = R_{rf} + (R_M - R_{rf})*\beta_E$
Modified CAPM	ke = Rf + B(RPm) + RPs + Rpu
Valuation formula	Kd = Marginal borrowing rate (1 - marginal tax rate)
Weighted average cost of capital (WACC)	$W_S R_S + W_D R_D$
Weighted average cost of capital with TAX impact	$W_S R_S + W_D R_D(1-T)$
Weighted average cost of capital with TAX impact and Preferred Stock	$W_S R_S + W_D R_D(1-T) + W_{PS} R_{PS}$
Interest rate parity: US$ to Euro	$F(euro/\$) = S(euro/\$)\ (1 + R^{euro}_{rf})/\ (1 + R^{\$}_{rf})$
Cost of Preferred Stock	$R_{PS} = (D_{PS} / P_{PS})$
Cost of Equity with Flotation costs	$R_S = (D_1 / (P_0 *(1 - F))) + g$
Purchasing power parity	Pdollar = S(dollar/euro) * Peuro
Dividends Paid Out	NI – (w_s * Capital Budget)
Dividend growth	$R_s = (D_1 / P_0) + g$
Bond yield plus risk premium	$R_s = Y_{LTD}$ + Equity Risk Premium
Profit from ownership of a Call option	$Profit^{long}_{call} = - C_o + Max(S-X, 0)$
Profit from ownership of a Put option	$Profit^{long}_{put} = - P_o + Max(X-S, 0)$
Break even point for a Call option	$S = X + C_o$
Break even point for a Put option	$S = X - P_o$
Black Scholes Option Pricing model	$d_1 = \frac{\ln(S/K) + \left(r + \frac{S^2}{2}\right)t}{s(\sqrt{t})}$ $d_2 = d_1 - s(\sqrt{t})$

Finance Abbreviations Defined

B = Beta	A coefficient used to modify a rate of return variable.
B_L	Levered beta
B_U	Unlevered beta
B_R	Relevered beta
C	Call premium
e	Exponential item
EBIT	Earnings before interest and taxes
EBITDA	Earnings before interest, taxes, depreciation, and amortization

g	Long-term rate of growth
K	Option striking price
K_E	Discount rate of common equity capital
K_d	After-tax cost of debt
ln	Natural log
N	Cumulative standard normal distribution
NCF	Net cash flow
r or R_F	Risk free interest rate (investments free of default risk)
RP_m	Equity risk premium for the market (return that is > risk free rate)
RP_S	Risk premium for small stock premium that is > RPm (average size stock)
s	Standard deviation
S	Current stock price
t	Tax rate, or Time Until Option Exercise
We	Weight of common equity in capital structure
Wd	Weight of debt in capital structure