Helpful formulas for FIN3014

Balance Sheet Identity: Assets = Liabilities + Shareholders Equity

OCF = EBIT – Taxes + Depreciation
   EBIT = Sales – Operating Costs – Depreciation
   Taxes = t×EBIT, where t = tax rate
   Net Income = EBIT – Interest - Taxes

Current Ratio = CA / CL
Quick Ratio = (CA – Inventory)/CL
Op Profit Margin = EBIT/Sales
Net Profit Margin = Net Income/Sales

Assets to Equity Ratio = Assets/Equity
Tot. Asset Turnover = Sales/Total Assets
ROA = Net Income/Total Assets
ROE = Net Income/Total Equity

Assets to Equity Ratio = Assets/Equity

Op Profit Margin = EBIT/Sales
Net Profit Margin = Net Income/Sales

Basic value change difference equation for time value of money

\[ V_{t+1} = V_t \times (1+i_{t+1}) \]

Single Sum Compounding and Discounting

\[ FV = PV(1+i)^N \]
\[ PV = FV/(1+i)^N \]
\[ i = (FV/PV)^{1/N} - 1 \]
\[ N=(\ln(FV/PV)) / (\ln(1+i)) \]

Perpetuity and Annuity

\[ PV=PMT/i \]
\[ PV = PMT/i – PMT/[(1+i)^N] \]
\[ PV = CF/(i-g) \]

Fisher Effect:

\[ 1+R = (1+r) \times (1+h) \]
Exact
\[ R = nominal \ rate \ of \ return, r = real \ rate \ of \ return, h = inflation \ rate \]

Approximation
\[ R = r + h \]

DDM’s (constant growth rate = g, and R>g)

\[ P_0 = D_1/(R-g) \]
\[ D_1 = D_0 \times (1+g) \]

More generally
\[ D_{t+1} = D_t \times (1+g) \]

Holding Period Return (hpr) [also may be called total return]

\[ hpr = (EV-BV)/BV, \ where \ EV=ending \ value, \ BV=beginning \ value \]

Dollar return = EV – BV = Cash payment + P_t – P_{t-1} (Note: BV = P_{t-1})

APR = hpr × m \ where \ m = number of periods per year

EAR = \((1+hpr)^m - 1\)

Arithmetic mean return = \([hpr_1 + hpr_2 + hpr_3 + \ldots + hpr_N] / N\)

Geometric mean return = \([[(1+hpr_1) (1+hpr_2) (1+hpr_3) \ldots (1+hpr_N)]^{1/N} - 1\)

Risk premium = E(R_i) – R_t

Expected return and beta for a portfolio

\[ E(R_p) = x_1E(R_1) + x_2E(R_2) + \ldots + x_nE(R_n) \]
Where: \( x_i = portfolio \ weights \ which \ sum \ to \ one. \)
\[ \beta_p = x_1\beta_1 + x_2\beta_2 + \ldots + x_n\beta_n \]

CAPM

\[ E(R_i) = R_f + \beta_i(E(R_m) – R_f) \]
Note: (E(R_m) – R_f) is also called the Equity (or Market) risk premium

\[ NPV = PV \ of \ CF^{*} – Investment \ Cost \]
\[ PI = (PV \ of \ CF^{*}) / (Investment \ Cost) \]

Project ATCF = OCF – NWC – Investment
(Note: These are all ATCF’s)

Straight Line (Annual) Depreciation = (Investment – Salvage)/Years

ATCF from Salvage = Salvage – tax (Salvage is the Sale Price of salvaged equipment)

\[ \text{tax} = t(\text{Salvage} – \text{BookVal}) \] where \( t= \text{tax rate}, \ \text{BookVal} = \text{Investment} – \text{Accumulated Depreciation} \)

Cost of Equity and Firm Valuation

(DDM approach) \[ r_E = D_1/P + g \]
(CAPM approach) \[ r_E = R_f + \beta_E(E(R_m) – R_f) \]

\[ V = E + D \] (by algebra, 1 = E/V + D/V, where E/V can be interpreted as a portfolio weight= \( w_E \))

\[ WACC = E/V \times r_E + D/V \times r_D \times (1-T_C) \] (for no preferred, where \( T_C = \text{corporate tax rate} \))