Chapter 2: Balance Sheet, Income Statement and CFFA

Balance sheet

CA = cash + AR + inventory
TA = CA + NFA + other intangible assets
CL = AP+NP
TL or TD or D = CL+ LTD
OE or TE or E = CS at par + add. paid-in surplus − RE − preferred stock (if any)
CS = CS at par + add. paid-in surplus or capital − RE
TA = TL + OE
NWC = CA − CL

Income statement

EBIT = sales − CGS − depreciation − other expenses

Taxable income or EBT = EBIT − interest paid; Taxable income $= \frac{NI}{(1-T)}$

Taxes = taxable income x tax rate
NI = Taxable income-taxes
NI = add. to RE + dividends
EPS = NI/ (# of shares outstanding)
PE ratio=current price/EPS

CFFA (2 ways)

a) **CFFA = OCF-NCS- ΔNWC**
OCF = EBIT − depreciation − taxes
$NCS = NFA_{end} - NFA_{beg} + depreciation$
$\Delta NWC = NWC_{end} - NWC_{beg} = (CA_{end} - CL_{end}) - (CA_{beg} - CL_{beg})$

b) **CFFA =CF to creditors + CF to shareholders**
CF to creditors=interest paid − net new borrowing=interest paid− $(LTD_{end} - LTD_{beg})$
CF to stockholders= dividends paid − net new equity raised =
= dividends paid − $(OE_{end} - OE_{beg}$ − add. to RE (if any))

Taxes: Average tax rate = taxes to be paid/taxable income

Chapter 3: Ratios

PM = NI/sales; TAT = sales/TA; EM=1+(TL/OE)=TA/OE
ROA = NI/TA = (NI/sales) x (sales/TA) = PM x TAT
ROE = NI/OE = (NI/sales) x (sales/TA) x (TA/OE)=PM x TAT x EM=ROA x EM
Dividend payout ratio = Cash dividends / Net income
Retention or plowback ratio (b) = add. to RE/NI = (NI − cash dividends)/NI
= 1 − dividend payout ratio

Internal Growth Rate $= \frac{(ROA \times b)}{(1 - (ROA \times b))}$; Sustainable Growth Rate $= \frac{(ROE \times b)}{(1-(ROE \times b))}$

Current ratio= CA/CL; Quick ratio=(CA − Inventory)/CL;

FINA 3310 Formulas: Chapters 2, 3, 4, 5, 6

Cash ratio Cash CL
Total debt ratio TD TA (TA TE) TA. Debt to equity ratio TD TE
TIE EBIT Interest. Cash coverage ratio (EBIT + Depreciation) Interest
Inventory turnover CGS Inventory. Days sales in inventory 365 inventory turnover
Receivable turnover sales AR. Days sales in receivables 365 receivable turnover
Capital intensity TA Sales
Market to book ratio market value per share book value per share

Chapter 4

Single cash flows

Compound interest $FV = PV(1+r)^n$ $PV = \frac{FV}{(1+r)^n}$ $n = \frac{\ln\left(\frac{FV}{PV}\right)}{\ln(1+r)}$ $r = \left(\frac{FV}{PV}\right)^{\frac{1}{n}} - 1$

Simple interest FV PV + PV(r)(n) PV(1 + (r * n))

Interest on interest FV FV

Chapter 5

Ordinary Annuities

$PV = PMT\left[\frac{(1+r)^n - 1}{r(1+r)^n}\right]$ $FV = PMT\left[\frac{(1+r)^n - 1}{r}\right]$ $PMT = \frac{PV}{\left[\frac{(1+r)^n - 1}{r(1+r)^n}\right]}$

Total interest paid over the life of an amortized loan (PMT * number of pmts) amount borrowed

Annuities Due

PV PMT (1 r) FV PMT (1 r) PMT (1 r)

Perpetuities: PV C r

Chapter 6: Bonds

Annual Coupon Payment coupon rate x FV $PV = PMT\left[\frac{(1+YTM)^{-n} - 1}{YTM(1+YTM)^{-n}}\right] + \frac{FV}{(1+YTM)^n}$

Fisher Equation: $(1-R) = (1+r)(1+h)$

Municipal vs. corporate bonds: r (1 T) r

FINA 3310 Formulas: Chapters 7, 8, 9

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Tentative Formulas for ch. 7, 8, 9

Chapter 7

Single cash flow: $PV = \frac{FV}{(1+r)^t}$

Level perpetuity: $P = \frac{D}{r}$

Growing Perpetuity: [illegible]

DGM: [illegible]

Chapter 8

$NPV = \sum \frac{CF_t}{(1+r)^t}$; $0 = NPV = \sum \frac{CF_t}{(1+IRR)^t}$; $PI = \frac{\sum \frac{CF_t}{(1+r)^t}}{CF_0}$

Chapter 9

Depreciation

Straight line annual depreciation = $\frac{\text{(initial investment − ending value)}}{n}$

MACRS Depreciation

MACRS annual depreciation = MACRS rate × initial cost

Accum. Deprec. = sum of all annual depreciations up to and including year t

BV = Initial Cost − Accum. Deprec. = Initial cost × [1 − (sum of all MACRS rates up to and including year t)]

ATSV = MV − (MV − BV) × T

Net Working Capital and ΔNWC

$CA = Cash + AR + Inventory$; $CL = AP + NP$

$NWC = CA - CL$; $\Delta NWC = NWC_t - NWC_{t-1}$ = *Change in CA − Change in CL*

Increases in NWC (i.e. ΔNWC > 0) should be recorded with a negative sign while decreases in NWC (ΔNWC < 0) with a positive sign

Recovery or replacement of NWC = −1 × (sum of all ΔNWC for all years, if any)

Various ways of calculating OCF in any year t

OCF = (sales−variable costs−fixed costs−depreciation)(1−T) + depreciation

OCF = (reduction in costs−depreciation)(1−T) + depreciation

Very important additional notes on OCFs

If the undertaking of a new project will affect the sales of other existing product lines, then all relevant incremental cash flows (*typically* changes in sales and resulting changes in variable costs) should also be included in the calculation of the OCF with the appropriate sign (i.e. increases in sales with a positive sign while decreases in sales with a negative; increases in variable costs with a negative sign while decreases of variable costs with a positive).

Theodossiou, A. (2011) Lecture on Financial Management. Personal Collection of A. Theodossiou, Texas A&M University-Corpus Christi, Corpus Christi, Texas.

Formulas for Chapters 10, 11, 12

Chapter 10

$$R = \frac{D_1}{P_0} + \frac{P_1}{P_0} \qquad \frac{P_1}{P_0} \qquad \frac{D_1}{P_0} \qquad \frac{P_1}{P_0} \qquad \frac{P_1}{P_0}$$

$$GeR = [(1+R_1)(1+R_2)\cdots(1+R_n)]^{1/n} - 1$$

Arithmetic Average $= \frac{R_1 + R_2 + R_3 + \cdots + R_n}{n} = \frac{\sum R}{n}$

Chapter 11

$$E(R) = pr_1R_1 + pr_2R_2 + \cdots + pr_nR_n = \sum pr_iR_i$$

$$E(R_p) = w_1E(R_1) + w_2E(R_2) + \cdots + w_nE(R_n) = \sum w_iE(R_i)$$

where w_i = $\frac{\text{value of asset } i}{\text{total value of portfolio}}$, $\sum w_i = 1$

$$\beta_p = w_1\beta_1 + w_2\beta_2 + \cdots + w_n\beta_n = \sum w_i\beta_i, \quad \beta_{rf} = 0 \text{ and } \beta_m = 1$$

$$SML: E(R_i) = r_{rf} + [E(R_m) - r_{rf}]\beta_i \text{ or } r = r_{rf} + (r_m - r_{rf})\beta$$

$$RP_m = E(R_m) - r_{rf} \text{ or } RP_m = r_m - r_{rf}$$

Chapter 12

$WACC = w_d r_d (1-T) + w_p r_p + w_e r_e$ where $r_d(1-T)$ = after tax cost of debt

V_d = number of bonds x bond price, V_p = number of preferred shares x preferred share price

V_e = number of common shares x common share price, $V = V_d + V_p + V_e$,

$w_d = \frac{V_d}{V}$, $w_p = \frac{V_p}{V}$, $w_e = \frac{V_e}{V}$

Before tax cost of debt, r_d = the YTM of the company's bonds

$PV = PMT \left[\frac{1 - \frac{1}{(1+YTM)^n}}{YTM}\right] + \frac{FV}{(1+YTM)^n}$ and PMT = coupon rate $\times FV$

Cost of preferred, $r_p = \frac{D}{P}$ or you get the dividend rate then D = dividend rate $\times$ par

where par = the typical par value of preferred

Cost of common equity, r_e Two ways to calculate

1st way, SML: $r_e = r_{rf} + (r_m - r_{rf})\beta$

2nd way, DGM: $r_e = \frac{D}{P} + g$