Managerial Finance
FRL 300
Formula Sheet
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(revised September 2012)

Average Tax Rate = \( \frac{\text{Tax Liability}}{\text{Taxable Income}} \)

Cash Flow from Assets = Cash Flow to Creditors + Cash Flow to Stockholders

Operating Cash Flow
- \( \Delta \text{Net Working Capital} \)
- Net Capital Spending
Cash Flow from Assets

Interest Paid
- Net New Borrowing
- Net New Equity
Dividend Paid
Cash Flow to Creditors
Cash Flow to Stockholders

EBIT
+ Depreciation
- Taxes
Operating Cash Flow
Ending Net Fixed Assets
- Beginning Net Fixed Assets
+ Depreciation
Net Capital Spending

Ending Net Working Capital (CA – CL)
- Beginning Net Working Capital (CA-CL)
Change in Net Working Capital

Ending L.T. Debt
- Beginning L.T. Debt
Net New Borrowing
Ending Equity
- Beginning Equity
- Addition to Retained Earnings
Net New Equity
Internal Growth Rate = \frac{\text{ROA} \cdot b}{1 - (\text{ROA} \cdot b)}

Sustainable Growth Rate = \frac{\text{ROE} \cdot b}{1 - (\text{ROE} \cdot b)}

Earnings Retention Ratio = b = 1 – Dividend Payout Ratio

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

\text{Cash Ratio} = \frac{\text{Cash}}{\text{Current Liabilities}}

\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}}

\text{NWC Ratio} = \frac{\text{NWC}}{\text{Total Assets}}

\text{Interval Measure} = \frac{\text{Current Assets}}{\text{Average Daily Operating Cost}}

\text{Total Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}} = \frac{\text{Total Assets} - \text{Total Equity}}{\text{Total Assets}}

\text{Debt-to-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}

\text{Time Interest Earned} = \frac{\text{EBIT}}{\text{Interest}}
Cash Coverage Ratio = \( \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}} \)

Fixed Charge Coverage Ratio = \( \frac{\text{EBIT} + \text{Lease Pmt.}}{\text{Interest} + \text{Lease Pmt.} + \frac{\text{Sinking Funds}}{1-T}} \)

Long-Term Debt Ratio = \( \frac{\text{Long-Term Debt}}{\text{Long-Term Debt} + \text{Equity}} \)

Equity Multiplier = \( \frac{\text{Total Assets}}{\text{Equity}} \)  
or  \( EM = 1 + \frac{D}{E} = \frac{1}{1 - \frac{D}{TA}} \)

Total Assets Turnover = \( \frac{\text{Sales}}{\text{Total Assets}} \)

Fixed Assets Turnover = \( \frac{\text{Sales}}{\text{Net Fixed Assets}} \)

Inventory Turnover = \( \frac{\text{Sales}}{\text{Inventory}} \)  
or  \( \frac{\text{Cost of Goods Sold}}{\text{Inventory}} \)

Days' Sales in Inventory = \( \frac{365}{\text{Inventory t/o}} \)
Receivable Turnover = \( \frac{Sales}{Account\text{ Receivable}} \)

Days' Sales in Receivable = \( \frac{365}{Receivable\text{ t/o}} \)

Payable Turnover = \( \frac{Cost \ of \ Goods \ Sold}{Accounts\text{ Payable}} \)

Days' Purchases in Payable = \( \frac{365}{Payable\text{ t/o}} \)

Operating Cycle = Inventory Period + Accounts Receivable Period

Cash Cycle = Operating Cycle – Accounts Payable Period

\( NWC \ Turnover= \frac{Sales}{NWC} \)

Profit Margin (ROS) = \( \frac{Net \ Income}{Sales} \)

ROA = \( \frac{Net \ Income}{Total \ Assets} \)

ROE = \( \frac{Net \ Income}{Common \ Equity} \)
Return on Capital = \( \frac{\text{Net Income} + \text{Interest} + \text{Preferred Dividends}}{\text{Debt} + \text{Common Equity} + \text{Preferred Stock}} \)

Basic Earnings Power = \( \frac{\text{EBIT}}{\text{Total Assets}} \)

Earnings per Share = \( \frac{\text{Net Income}}{\text{No. Shares Outstanding}} \)

Price - Earnings Ratio = \( \frac{\text{Market Price per Share}}{\text{EPS}} \)

Market Value - Book Value Ratio = \( \frac{\text{Market Price per Share}}{\text{Book Value per Share}} \)

Dividend Payout Ratio = \( \frac{\text{Dividends}}{\text{Net Income}} \)

\( \text{ROA}_{\text{DuPont}} = \text{Profit Margin} \times \text{Total Assets t/o} \)

\( \text{ROE}_{\text{DuPont}} = \text{Profit Margin} \times \text{Total Assets t/o} \times \text{Equity Multiplier} \)

Internal Growth Rate = \( \frac{\text{ROA} \times b}{1 - (\text{ROA} \times b)} \)

Sustainable Growth Rate = \( \frac{\text{ROE} \times b}{1 - (\text{ROE} \times b)} \)

Earnings Retention Ratio = \( b = 1 - \text{Dividend Payout Ratio} \)
\[
\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}
\]

\[
\text{Inventory Period} = \frac{365}{\text{Inventory Turnover}}
\]

\[
\text{Receivable Turnover} = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}
\]

\[
\text{Receivable Period} = \frac{365}{\text{Receivable Turnover}}
\]

\[
\text{Payable Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Payable}}
\]

\[
\text{Payable Period} = \frac{365}{\text{Payable Turnover}}
\]

\[
\text{Average} = \frac{\text{Beginning} + \text{End}}{2}
\]

\[
FV = PV(1 + r)^t = PV \times FVIF_{r,t}
\]

\[
PV = \frac{FV}{(1 + r)^t} = FV \times PVIF_{r,t}
\]

\[
FV = PV\left(1 + \frac{r}{m}\right)^{m \times t} = PV \times FVIF_{\frac{r}{m},mt}
\]

\[
PV = \frac{FV}{\left(1 + \frac{r}{m}\right)^{m \times t}} = FV \times PVIF_{\frac{r}{m},mt}
\]

\[
FV = PV \times e^{rt}
\]
\[ PV = FV \cdot e^{-r \cdot t} \]

\[ \text{EAR} = (1 + \frac{r}{m})^m - 1 \]

\[ FVA = C \cdot \left[ \frac{(1+r)^t - 1}{r} \right] = C \cdot FVIFA_{r,t} \]

\[ PVA = C \cdot \left[ \frac{1}{r} \cdot \frac{1}{r \cdot (1+r)^t} \right] = C \cdot PVIFA_{r,t} \]

\[ PV_{\text{Perpetuity}} = \frac{C}{r} \]

\[ FVA = C_{\text{due}} \cdot \left[ \frac{(1+r)^t - 1}{r} \right] \cdot (1+r) = C_{\text{due}} \cdot FVIFA_{r,t} \cdot (1+r) \]

\[ PVA = C_{\text{due}} \cdot \left[ \frac{1}{r} \cdot \frac{1}{r \cdot (1+r)^t} \right] \cdot (1+r) = C_{\text{due}} \cdot PVIFA_{r,t} \cdot (1+r) \]

**Reminder:** In the case of frequent compounding or discounting, divide the nominal rate (APR) by “m” and multiply period by “m”. “m” is number of times interest is compounded/discounted in one period. Also, annuity interval must match the frequency (m) of compounding or discounting.

\[ \text{Bond Value} = C \cdot \left[ \frac{1}{r} \cdot \frac{1}{r \cdot (1+r)^t} \right] + \frac{FV}{(1+r)^t} \]
\[(1+R) = (1+r)\times(1+h)\]

\[
\text{Coupon Rate} = \frac{\text{Coupon}}{\text{FV}}
\]

\[
\text{Current Yield} = \frac{\text{Coupon}}{V_B}
\]

\[
V_B = C \times \left[ \frac{1}{YTM} - \frac{1}{YTM \times (1+YTM)^t} \right] + \frac{FV}{(1+YTM)^t}
\]

\[
P_0 = \frac{D_1}{(1+r)^1} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \ldots\ldots
\]

\[
P_0 = \frac{D_1}{(1+r)^1} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \ldots + \frac{D_n}{(1+r)^n} + \left[ \frac{D_{n+1}}{r - g_c} \times \frac{1}{(1+r)^n} \right]
\]

\[
P_0 = \frac{D}{r}
\]

\[
P_0 = \frac{D_1}{r - g}
\]

\[
r = \frac{D_1}{P_0} + g
\]

\[
D_n = D_0 \times (1 + g)^n
\]

\[
\text{NPV} = \sum_{i=1}^{n} \frac{CF_i}{(1+r)^t} + (CF_0)
\]
\[
\sum_{t=0}^{n} \frac{CF_t}{(1 + IRR)^t} + (CF_0) = 0
\]

\[
P_I = \sum_{t=1}^{n} \frac{CF_t}{(1 + r)^t} \left| CF_0 \right|
\]

\[
PBP = t + \frac{\left| \text{Cum} CF_t \right|}{CF_{t+1}}
\]

\[
ARR = \frac{\sum_{t=0}^{n} \text{Net Income}_t}{\frac{\text{Beginning Value Investment} + \text{Ending Value Investment}}{2}}
\]

\[
\sum_{t=0}^{n} CIF_t \cdot (1 + r_t)^{n-t} = \sum_{t=0}^{n} CIF_t \cdot (1 + r_t)^{n-t} \cdot \frac{(1 + MIRR)^n}{(1 + r_F)^t}
\]

**Operating Cash Flow** = (Sales – Variable Cost – Fixed Cost – Depreciation)(1-T) + Depreciation

**Operating Cash Flow** = EBIT + Depreciation – Taxes

**Operating Cash Flow** = (Sales – OC – Depreciation) * (1-T) + Depreciation

**Operating Cash Flow** = Net Income + Depreciation

**Operating Cash Flow** = (Sales – OC) * (1 – T) + T * Depreciation

**Book Value of Asset** = Original Cost – Accumulated Depreciation

**Straight-Line Depreciation** = \( \frac{\text{Original Cost} – \text{Salvage Value}}{n} \)