

Snazzlefrag's Principles of Finance DSST Study Notes

Contact: <http://www.degreeforum.net/members/snazzlefrag.html>

Hosted at: <http://www.free-clep-prep.com>

Financial Statements: All company financial information to evaluate performance

Financial Manager: Raise Funds, Financial Planning and Analysis, Asset Management. Increase SH equity.

Generally Accepted Accounting Principles (GAAP): Allows easy comparison of financial statements b/n companies.

Financial Accounting Standards Board (FASB): Accountings ruling body. They set the GAAPs.

Current Rate Translation Method (#52): US-based Cos convert foreign currency ass/liabs into \$ (exch rate=end fiscal year)

On Balance sheet as: **Cumulative Translation Adjustment (CTA #52):** Gains/Losses from currency conversion

- **Balance Sheet:** Assets v Liabilities (debt or owner's equity). A snapshot of a Co's financial standing at an **instant in time**.

"Statement of Financial Position"

Bottom Line must always balance: **Assets = Liabilities + Owner Equity**. Cash Flow from Assets = Cash Flow to Investors

All items must be listed at Fair Market Value.

- **Assets:**
 - Current Assets:** Cash + Accounts Receivable + Inventory + Investments (marketable securities=convert to cash <1yr) + prepaid expenses.
 - Fixed Assets (Long-term Assets):** (Property + Equipment - Accumulated Depreciation) + Long-term investments + Goodwill
- **Liabilities:**
 - Current Liabilities:** Accounts Payable, Wages Payable, Short-term Loans, Prepaid Expenses, Bonds, Current Taxes, Cash Dividends
 - Fixed Liabilities (Long-term Liabilities):** Long-term Bank Loans Payable, Deferred Taxes
- **Owner's Equity (Shareholders):** Paid-in Capital (owner) + Common Stock (corp) + Retained Earnings(profits - drawings & dividends).
Equity = Assets - Liabilities.

Cash Flow Statement: Summary of operating investment and financing cash flows over a particular **period of time**.

Sources of Cash Flow Categorized as: Operating Activities, Investing Activities, Financing Activities.

- **Cash Flow Calculations:** From both the Balance Sheet & Income Statement. How funds were obtained and used.

Operating Cash Flow (OCF) AKA "Unlevered Free Cash Flow (UOCF)" = EBIT + Depreciation - Taxes

The ability of the firm to sell its products for more than the cost of production.

Capital Spending = Ending Net Fixed Assets - Beginning Net Fixed Assets + Depreciation

Reflects the firm's net investment in fixed assets during the period.

Addition to Net Working Capital = Ending Net Working Capital - Beginning Net Working Capital

The firm's investment in Net Working Capital during the period.

Cash Flow from Assets = Operating Cash Flow - Capital Spending - Addition to Net Working Capital

A healthy firm would be expected to generate positive cash flow.

Cash Flow to Debtholders = Interest Expense - Ending Long-Term Debt + Beginning Long-Term Debt

Debt service represents interest expense and repayments of principal. Int Expense is biggest flow from firm to debtors.

Cash Flow to SH = Dividends - (End Common Stock + End Capital Surplus) + (Begin Common Stock + Begin Capital Surplus)

The principal cash flow from the firm to its Common Stockholders is dividends.

Cash Flow to Preferred Stockholders = Preferred Dividends Paid - (Ending Preferred Stock - Beginning Preferred Stock)

Cash Flow to Investors = Cash Flow to Debtholders + Cash Flow to Common Stockholders + Cash Flow to Preferred Stockholders

Cash Flow from Assets = Cash Flow to Investors

- **Common Size Statement:** Evaluates **profitability** of each item sold **as a percentage** of sales (compares different Years/Companies).

Vertical Analysis. AKA "Normalized Financial Statements". Uses two ratios:

Gross Profit Margin and Net Profit Margin

Income Statement: "Profit & Loss Statement" (**profit - operating costs and taxes**) for a **particular period** end on a specified date.

Accounts Receivable: Money owed to the Co from credit sales. $(AR / Annual Credit Sales) * 365$

Book Value: Net value of fixed assets = **Gross fixed assets value - accumulated depreciation value.**

Common Stock: \$1 Par value. A randomly appointed per share value for accounting purposes.

Earnings Before Interest & Tax (EBIT): "**Operating Profit**". Measure of Co's gross earning power from **ongoing** operations.

Sales, Cost of Goods Sold (COGS), Expenses, Discounts, Depreciation, # of Outstanding Shares, Price Per Share.

Also includes: Interest on Debt, and Preferred Stock Dividends (must be paid even if insufficient EBIT to cover the cost).

Fixed Assets & Liabilities: Long-term. Longer than 12 months.

Property, Buildings, Machinery/Equipment, Furniture/Fixtures, Leasehold Improvements..Minus Depreciation.

Inventories: Raw material, partially and completed goods in Co's possession.

Net Worth (Shareholder/Owner's Equity): **Total assets - total liabilities** (the owner's share of the business).

Retained Earnings Statement: Net Income + Retained Earnings - Dividends

Ratio Analysis: Assess Co performance by calculating AND interpreting. Of interest to management/creditors/shareholders.

Order Done = Profitability. Asset. Liquidity. Debt.....analyze internal and industry-wide benchmarks.

Requires at least two financial statements: Balance Sheet, Income Statement.

Financial Statements for ratio analysis should be from the same time of year (avoids seasonality).

Financial Ratio Analysis should only be carried out on Audited accounts (independently verified as correct).

Combined Analysis: Combined perspective mixing both type of analysis. Presents clearer picture for the analyst.

Cross-section Analysis/Vertical/Common Size: Compares ratios at the same point in time w/ other Cos in industry (req accurate data)

Looking for major deviations (warning sign that something is not right w/ the Co)

Time-series Analysis/Horizontal/Trend: Comparison of current performance w/ past performance.

Summary Analysis: Utilizes: Liquidity, Activity, Profitability, and Debt ratios.

1. **Liquidity Ratios:** Liquidity = Co's ability to meet it's **SHORT-TERM SOLVENCY** obligations. Avoid fin distress in the short-run.

*Based on Financial Statement. Should be used in conjunction with Activity Ratios

Current Ratio = Liquidity (ability to cover short-term liabilities: <1yr). **Current Assets ÷ Current Liabilities**. 2 or better=ideal

1:1 = Zero Working Capital. Should be more assets than liabilities.

Current Assets: Convert to cash within 1yr: Cash, Accounts Receivable, Inventories. **2:1=Twice as many assets as liabs.**

Current Assets are expensive to finance. 40% of Manuf indus assets are Current Assets (least are cash & securities)

Permanent Current Assets(fixed assets), Temporary Current Assets (Seasonal).

Current Liabilities: Wages, Notes Payable, Accounts Payable, Interest.

Quick Ratio (Acid Test) = Current Assets - Inventories ÷ Current Liabilities.

Also seen as: [(Cash + Temp. Investments + Accounts Receivable) / Current Liabilities] : 1

Inventory, supplies, prepaid expenses are excluded b/c they are least liquid current asset.

Best analysis when inventory cannot be easily converted to cash (= have to sell at a discount and lose \$). 1 or higher = good

Cash Ratio: (Cash + Marketable Securities) / Current Liabilities.

Net Working Capital: Current Assets - Current Liabilities.

Gross Working Capital = All Assets. (uses Acid-test and Current Ratio)

Profitability Ratios: Firm's success in generating income/profit. Reflect combined effects of firm's asset and debt management.

Cost of Goods Sold = Beginning Inventory + Net Purchases - Ending Inventory.

Net Profit Margin: **Net Income After Tax ÷ Net Sales.** (*100) Dollar amount of income

the firm earns on each dollar of sales.

Gross Profit Margin: **Gross Income ÷ Net Sales**. % of sales \$ left after expenses and profit after COGS is deducted from sales.

Gross Profit Margin & Net Profit Margin (after expenses/taxes). Higher = Better.

Must be compared to industry average.

Dupont System of ROE: Return on Assets (ROA) expressed in terms of the profit margin and asset turnover.

1) Calculate ROA. 2) $ROE = (ROA * FLM)$. Use of FLM better reflects Co debt on SH returns. FLM = same as Equity Multiplier.

1. Financial Leverage Multiplier (FLM): **Total assets ÷ Stockholders Equity**. Cons: Assumes reliable accounting GIGO!

Splits SH profitability into 1) Expense Control, 2) Asset Turnover, 3) Debt Utilization. Allows for better scrutiny.

Return on Assets (ROA/ROTA/ROI): **Net Income ÷ Total Assets**. Indicator of profitability. Result shown as X%

Higher ROA = Higher ROE

Ability to turn over a profit using available assets. Useful if compared w/ interest rate paid on Co's debt. Annually.

Return on Equity (ROE): **Net Income ÷ Total Owner's Equity**. Higher = better return for stockholders. High = funds from debts.

Bottom line measure for the Shareholders. Measures the profits earned for each dollar invested in the firm's stock.

2. **Market Value Ratios**: Compares stock price to book values obtained from firm's financial statements.

Earnings Per Share (EPS): **Net income ÷ # of Outstanding Shares**. If profit = \$200 and 100 shares. $EPS = \$2/\text{Common Share}$.

Market to Book Ratio: Success in creating value for SH. "value-based investors".

Price Per Share ÷ book value Per Share.

Book Value Per Share: **Total Owner's Equity ÷ # of Outstanding Shares**.

Price-Earnings Ratio (P/E): **Current Stock Price ÷ Current EPS**. High P/E = high SH confidence in future perf (pay more).

3. **Debt Management Ratios**: "Debt = Risk" = Co's abil to use Fin Leverage(debt) and avoid distress in the long-run.

Proportion of Co's assets that are financed by creditors. Lower=bad. Debt= A FIXED COST. Tax-law favors debt (interest is tax ded)

Debt to Equity Ratio = **Total Liabilities ÷ Total Owner's Equity**. proportion of equity/debt co is using to finance its assets. Higher=bad

Proportion of assets supplied by creditors (loans) versus amount supplied by owner or stockholders. 1.5:1 = 1.5 Debt : 1 Owner Equity

Debt to Asset Ratio = **Total Liabilities / Total Assets**. >1=more debt than assets.

Equity Multiplier (AKA **Leverage Ratio** or **Financial Leverage Ratio**) = **Total Assets ÷ Total Owner's Equity**.

Fixed Charge Coverage: **(net income before interest and taxes + interest + fixed costs) ÷ fixed costs**.

Measures "Risk". Ability to meet it's fixed scheduled payments. Lower = greater risk of bankruptcy

Times Interest Earned (TIE): **EBIT ÷ Interest**. Measure of Co's ability to meet interest payments. Higher = better.

Lower = more vulnerable to higher interest rates (ie, less money to cover interest payments) Good = >3, pref 5.

Asset Management Ratios: Co's ability to manage it's assets to generate sales (ie, efficient inventory management, credit policy etc.)

*Based on Income Statement.

Also called **Activity Ratios** or **Turnover Ratios** (How quickly various assets and liabilities can be liquidated).

Average Collection Period: **(Accounts Receivable ÷ Annual Net Credit Sales) * 365**.

How quickly custs paying bills. Low=good

Average Payment Period: Accounts Payable / Average Purchases per Day

Cash Cycle: Days in Inventory + days in Receivables - Days in Payables.

Days' Receivables Ratio: "Management of accounts/credit policy". Higher=good. **365 ÷ Receivables Turnover**.

Days' Inventory Turnover ("Inventory Period"): "Management of Inventory" **365 ÷ Inventory Turnover** or: Average Inventory/(COGS/365)

Fixed Assets Turnover: **Sales ÷ Net Fixed Assets**. Efficiency of using fixed assets to generate sales.

Inventory Turnover: **Cost of Goods Sold ÷ Average Inventory** (compare against industry average).

Liquidity of Inventory/acnts payable. High=Good.

Some firms use FIFO, LIFO, or Weighted Average method of inventory management. Comparison must use same method.

LIFO most expensive if cost of goods increase. FIFO cheapest (most profits b/c paid less for inventory).

Receivables Turnover: "management of accounts/credit policy". Higher=good. **Net Credit Sales ÷ Average Accounts Receivable**.

Short-term Operating Cycle: **Accounts Receivable(average days) + Accounts Payable(average days)**

Short-term Operating Cycle Turnover: **365/Short-term Operating Cycle** (see above).

Total Assets Turnover: **Sales ÷ Total Assets**. Efficiency of using all assets to generate sales. Higher=good. Higher sales=good.

Economic Order Quantity: Optimal order size that will result in lowest total of order costs and carrying costs. **EOQ= (2*Sales*OC)/CC**

Average Inventory = Quantity Ordered/2

Total Inventory Cost (TIC) = Ordering Cost + Carrying Cost + Purchasing Cost.

Ordering Cost (OC) = Quantity Ordered * Cost per Order

Carrying Cost (CC) = (Quantity Ordered/2) x Purchase Price per Unit x Carrying Cost as a %age.

As order size increases = carrying costs go up (more inventory on hand), but ordering costs go down (less freq ordering required).

As order size decreases = carrying costs go down (less inventory on hand), but ordering costs go up (more freq ordering required).

Breakeven Analysis: Cost-Volume Analysis When level of sales will cover expenses

and begin to make a profit. When EBIT = Zero.

Need to know: Variable, Fixed, Semivariable (ie, sales commissions) Costs. Lower BE=good.

Breakeven Quantity = Fixed Costs ÷ (Price per unit - variable costs). Annual...so not good for long-term.

Breakeven Point = Breakeven Quantity * Price

Operating Profits (EBIT) = Price - (Fixed Costs / Quantity) - Variable Costs) * Quantity

Or: Profit - Cash Costs - Depreciation

Operating Loss = Breakeven Point - Reduced Selling Price

Absolute Loss = Cost - Reduced Selling Price

Use Dollar Analysis when Co sells a variety of products. Use Cash Analysis when lots of noncash costs.

Calc: [2nd][BRKEVEN] Enter FC, VC, P, PFT...Q [CPT]

Annual Deposits: Calc annual depts req to accumulate a future sum = $FVA_n / FVIFA_{k,n}$.

Annual Payments: Calc annual payment amounts required to pay off a loan = **Loan Amount(ie, $PVA_n / PVIFA_{k,n}$).**

Amortization: The gradual elimination of a liability (ie, mortgage), in regular payments over a given period of time. **Principal & Interest.**

Find PMT: (Note: Loan Amount=PV) Set P/Y. Divide APR by # of payments per yr. Solve for PMT.

Amort Schedule: [2nd][PV] (AMORT). [v] to view BAL, PRN, INT (first payment). [v]Set P1 & [v] P2 both=2...view for 2nd pymnt etc.

Find FV of Mortgage: Use FV of Annuity. Eg, A \$6000 loan at 10% over 4yrs = A 4yr annuity at 10% that has a PV of \$6000.

Fixed Costs: Rent, Depreciation, Salaries, Tax, Utilities, Insurance, Interest Payments.

Variable Costs: COGS, raw materials, electricity used in production, wages linked to production.

Semi-variable Costs: Sales Commissions, cost of supervision/inspection.

Leverage Ratio: "Equity Multiplier". **Assets / Shareholder's Equity**

Firms w/ higher leverage have higher fixed costs, higher breakeven points.

When sales are high, higher degree of leverage = maximize profits. When sales are poor, higher degree of leverage = greater losses.

Percent Change: **Calc:** $(X2 - X1) / X1 [\%] = \% \text{change}$. Eg, 160,000 increases to 216,00 = $216,000 - 160,000 / 160,000 [\%] = 35\%$

Operating Leverage: Extent to which fixed assets(property/equip) and fixed costs(rent/salaries/interest pmts) are used in the business.

Increased Fixed Costs = Higher DOL. **Higher DOL=higher profit beyond break-even point, greater loss below it.**

Increase in sales causes increase in EBIT more than proportional. Decrease causes decrease in EBIT more than proportional.

Decrease in Fixed Costs = Decrease in DFL or DOL. Higher DOL or DFL requires Higher Break-even Point

Degree of Operating Leverage (DOL): % change in EBIT (op income) / % change in Sales. If DOL >1 Operating Leverage exists.

DOL = $\text{Sales Quantity} \times (\text{Price} - \text{Variable Costs}) / (\text{Sales Quantity} \times (\text{Price} - \text{Variable$

Costs) - Fixed Costs).

or $DOL = (\text{Sales} - \text{Total Variable Costs}) / (\text{Sales} - \text{Total Variable Sales} - \text{Fixed Costs})$.

*Decrease in Fixed Costs = Decrease in Operating Leverage.

Limitations of Operating Leverage:

Assumes linear relationship b/n revenues and costs. New ventures can take several years to break-even. Does not address timing of cash flows.

Financial Leverage: Magnifies the effect of changes in EBIT on Op Income. **Higher DFL=higher profit beyond break-even point, lower below.**

How well a company is using its debt to finance it's assets. High DFL=high potential ROI(SH) but higher risk of bankruptcy if cannot pay debts.

Upper acceptable limit = 2:1. High = difficulty paying interest on debts. Financial

Leverage primarily affects debt/equity structure and fin risk of a firm.

Interest on Debt, Preferred Stock Dividends. If FL exists, increase/decrease in EBIT has higher than proportional effect on EPS.

Degree of Financial Leverage (DFL): % change in EPS / % change in EBIT. If $DFL > 1$ Financial Leverage exists ($ROE > ROA$)

$DFL = \frac{EBIT}{EBIT - \text{Interest} - (\text{Preferred Dividends} * 1 / (1 - \text{Taxes}))}$

or $DFL = \text{Debt} / \text{Equity}$ or $DFL = \text{Debt} / \text{Assets}$

Combined Leverage (or Total Leverage DTL): Magnifies the effects of changes in sales on the EPS.

Degree of Combined Leverage (DCL): % change in Net Income ÷ % change in Sales. $DCL = DFL \times DOL$

$DCL = \frac{\text{Quantity} \times (P - VC)}{\text{Quantity} \times (P - VC) - \text{Fixed Costs} - \text{Interest} - (\text{Preferred Dividends} * 1 \div 1 - \text{Taxes})}$

Operating/Business Risk: Risk of Co being unable to meet it's operating costs. Higher operating costs reqs higher sales to cover it.

Financial Risk: Risk of Co being unable to meet it's monetary costs (Eg, interest payments). Increased FL reqs higher EBIT to breakeven.

TVM: Money is worth more now than later, even adjusted for inflation b/c \$1 received now can appreciate in value over time (interest)

Future Value of Money (FVM): Today \$ expressed in tomorrow's dollars. **Compound.**

$FV = PV * (1 + i)^n$.

Present Value of Money (PVM): Future \$ expressed in today's \$. **Discount.** $PV = FV / (1 + i)^n$. Preferred b/c measures values at start of project.

PVM uses **Discounting Cash Flow:** Reverse of compound. Factors in: Cost of Capital/Opportunity Cost/Discount Rate/Required Return.

PVM assumes FV is measured at the END of the stated time period. Higher discount rate=lower PV, Longer time=lower PV.

Calcs can be simplified using **Present Value Interest Factor:** $PVIF = 1 / (1 + i)^t$.

PV of mixed stream: Eg, Unequal amounts or irregular time periods. **Determine PV of EACH future amount, then add them all up.**

Present Value of Perpetuity (PVP): PVP (ordinary/end of yr) = $\frac{PMT}{\text{interest rate}}$ (*100). PVP Due = $(\frac{PMT}{\text{interest rate}}) + PMT$ (*100).

Future Value of Annuity (FVA): Equal Payments at Reg Intervals. PMT: Amount depos annually at end of yr. Factor = $((1+i)^n - 1) / i$

Calc: Set P/Y if needed(1 or 2). [PMT] [I/Y] [N]...[CPT][FV] (Annuity Due = switch to

BGN)

Present Value of Annuity (PVA): Equal Payments at Reg Intervals. PMT: Amount depos annually at end of yr. Factor= $(1-(1+i)^{-n})/i$

Calc: Set P/Y if needed(1 or 2). [PMT] [I/Y] [N]...[CPT][PV] (**Annuity Due = switch to BGN**)

Future Value of an Uneven Cash Flow: Find NPV using [CF]. Then multiply the answer by $(1 + \text{interest rate})^{\text{number of years}}$

Present Value of an Uneven Cash Flow: Find NPV using [CF]

Interest on an Uneven Cash Flow (solving for k): Enter all [CF] then press [IRR]

Annual Percentage Rate (APR): related to IRR. Interest that is compounded more than once per year. Also called: Nominal Rate, Quoted Rate.

APR (Nominal Rate) convert to EAR (Effective Annual Rate= $\text{APR or NOM}/\text{periods per yr}$) and vice-versa...

Calc: [2nd][iconv]. Enter value for [NOM] or [EFF] and [C/Y] (periods per yr) then [CPT].

Periodic Rate: Actual interest rate per period (monthly/quarterly etc) of an APR/Nominal rate. **PR=Nom Rate / # of compound periods per yr.**

Example: A mortgage has a nominal interest rate of 12% compounded monthly. PR = $12/12 = 1\%$ Monthly Periodic Rate.

Comparison b/n Nominal Rate (APR) and Effective Annual Rate (EAR)....

Calc: Which is best: 10.1% semi-annually or 10% quarterly?

[2nd][iconv],[NOM]10.1[v][v],[C/Y]2 [^][EFF][CPT]=10.36% (repeat for 10%)

Simple Interest: $I = \text{Principal} * \text{Interest Rate} * \text{Time (must be in years)}$

Maturity Value: The total cost of the loan when Principal and Interest are added together.

Simple Interest Future Value: $FV = PV*(1+(i*n))$. i=interest rate per period, n=number of periods.

Compound Interest: $I = FV - PV$.

Compound Interest Future Value: $FV = PV*(1+i)^n$.

Cost-push Inflation: Higher prices because of higher production costs w/out increased productivity.(High Wages, High tax, Currency Deprec).

Demand-pull Inflation: Higher price because of an excess of demand over supply.

Working Capital Management: Financing & Controlling of the current assets of the firm.

Need to Finance Increases if: Sales increase but **Cash Cycle** remains fixed length. Sales remain flat but Cash Cycle lengthens.

Optimal Capital Structure = Minimizes the cost of debt and equity funds.

Short-term Financing: DEBT that matures within 1yr. Meet seasonal and current asset requirements. Cheaper than long-term.

Sources of Short-term Financing: Accounts Payable (trade credit), ST Bank Loans/line of credit, Commercial Paper, Accruals.

Most common source of Short-term Financing is Commercial Banks. Tax Accrual usually largest current liability for a business.

Secured Short-term Financing: Assets pledged as collateral. Cuts down on risk of loss, but not on risk of default.

Sources of Secured Short-term Financing: Commercial Banks, Finance Companies,

Factors, A/R Loans.

Collateral: "Current Assets" - **Accounts Receivable, Inventory** are most desirable collateral (very liquid).

Accounts Receivable: Considered prime collateral. A/R=40% of all Short-term financing.

Pledging=Collateral(lien). % of face value of A/R pledged (75% of face value max) 1-2% fees, 2-5% higher than prime.

Factoring=Sell accounts to a financial institution/bank (Factor). Assume collection of outstanding debts for small firms

Inventory: Attractive as collateral because market value is usually higher than the book value.

Trust Receipt Inventory Loan: Borrower promises to sell high-value items to immediately payback loan.

Warehouse Receipt Loan: Lender takes control of inventory and only releases it upon payback of loan.

Mortgage: Lender retains lien on home until mortgage is paid off.

Spontaneous Financing: Sourced from usual operations of firm.

Sources of Spontaneous Short-term Financing: **Accounts Payable** and **Accruals** (Eg, wages, taxes, interest on notes).

Current Liabilities: Appears on Balance Sheet. When credit is extended to purchasers of goods. Less than 1yr.

Credit Terms: Include cash discount (% reduction if buyer pays within specified timeframe shorter than credit period).

Begin date = invoice date or End of the Month/EOM (credit begins the following month).

"**4/15 net 45 EOM**": Credit Period=45days Cash Discount=4% if paid within 15days.

Credit Period starts end of month.

Purchaser usually settles the account on the last day of the discount period. No benefit to paying earlier.

Cost of giving up a cash discount = the interest paid if delay paying for an extra number of days (loss of discount).

CD*360/n (CD=Cash Discount %, n=number of days payment can be delayed by giving up the cash discount).

Eg, 1/10 net 30 = $1*360/20=18\%$ (30-10=20). Giving up the cash discount would cost 18% per year.

If cost of giving up cash discount is more than interest rate on a short-term loan, should take cash discount.

Delaying Payment (Stretching Accounts Payable) beyond # days given for payment.

Reduces cost of giving up CD.

Delaying Payment of Wages: Firm is effectively taking a loan against employees wages.

Unsecured Short-term Financing:

Sources of Unsecured Short-term Financing: Accounts Payable (trade credit), Bank Loans, Line of Credit, Commercial Paper.

Bank Loans: Interest rate charged is determined by Prime Rate of Interest

Commercial Paper: Short-term unsecured financing. Sold at discount from its par value. Buy \$90k, Sell back \$100k.

No prepay penalty. Cheaper than bank loans but high fees paid to dealers.

Bank Loans nurture good relationship with bank.

Interest Rate is usually lower than Prime Rate on Bank Loans.

Discount Loan: Interest is paid in advance from the amount borrowed. Higher effective interest rate than other loans.

Effective Interest Rate: Actual interest rate instead of the stated rate. Charges, funds, term of loan (days) factored in.

FC/UF*360/n (FC=finance charges, UF=Usable Funds: actual cash in hand received by borrower after fees etc.)

Floating Rate of Interest: Set at or above Prime, fluctuates over time (less risk to banks than Fixed Rate).

Line of Credit: Unsecured. Pre-agreed maximum loan money available. No guarantee to loan. Floating Rate.

Prime Rate of Interest: Best rate given by all the major banks to their best and most trusted customers

Revolving Credit: Unsecured. Guaranteed line of credit. Commitment Fee (5% of unused balance in credit line).

Single-payment Notes: Unsecured. One-time loan payable on maturity as FULL AMOUNT, fixed or floating rate.

Short-term Unsecured Self-liquidating Loan: Made against liquidat of invent or sale of goods (make money to pay loan)

Eg, Farmer takes out loan against the sale of crops. Sees a firm through seasonal adjustments.

Long-term Debts: Normally have maturity dates between 5 - 12 years. Always >1yr. More expensive than short-term debt.

Sources of Long-term Debt: Equity Capital, Equity Securities, Bonds, Long-term Bank Loans, Mortgages.

Restrictive Covenants: Operational/Financial limitations are placed on the borrower (protects the lender by oversight).

Standard Debt Provisions: Good accounting (GAAP), regular audited financial statement, taxes paid, going concern.

Subordination: Original lender has first claim before any subsequent creditors who loan to borrower.

Equity Capital: Permanent form of financing. No maturity date. No repayment is required.. "Angels"

Bonds: DEBT. Long-term debt obligation. Firm/Govt borrows money from public/banks (bondholders). Pay back later! Can be traded.

Most bonds are held by pension funds, mutual funds, banks and trusts.

Susceptible to interest rate swings. Higher interest rates = lower price for long-term bonds but not for short-term bonds.

Bond Indenture: Declares legal conditions under which bond is issued.

Call Feature: Stated price a bond can be bought back by the corporation at, before maturity. Above par value (premium).

Call Premium/Call Price: Price issuer must pay to call a callable bond. Usually = par value + 1 year's interest.

Contemporary Corporate Bonds: Modern versions = Zero-coupon, junk, floating-rate,

extendable notes, putable bonds.

Conversion Feature: Allows bondholders to convert bond into a pre-determined number of common stock shares.

Coupon Rate: A fixed percentage of the bond's par value. Represents the Interest Cost of the bond to the issuer (company).

$CR=C/Pr$. C=annual coupon or sum of coupon payments in one year. Pr=Principal (or face value).

Coupon Payments: Just like interest. Company makes regular payments to Bondholders (**usually semi-annual**). FIXED RATE.

Debenture Bonds: Unsecured Bond. Secured against general credit of the issuer rather than a specific lien on property. 15+ yrs.

Floatation Costs: Cost of issuing/sale of a bond. Fees paid to investment bankers, lawyers, accountants.

Indenture: contract/terms of agreement upon issuing of a bond.

Par Value: "Face Value". Amount paid to BH at maturity. **Assume \$1000**. Represents amount borrowed by the company.

Put Feature: An option to sell the bond back to the corporation before maturity.

Risk: Moody's. Standard & Poor's. Assess risk level of publicly traded bonds.

Secured Bonds: Mortgage Bonds, Collateral Trust Bonds, Equipment Trust Certificates.

Sinking-fund: Mechanism for the issuer to retire bonds.

Corp makes annual/semi-annual payments to the trustee who uses these funds to purchase bonds using a call feature.

Trustee: A paid third party who ensures that the issuer doesn't default.

Unsecured Bonds: Debentures, subordinated debentures, income bonds.

Warrant: An option to buy common stock at a pre-determined exercise (strike) price.

Yield to Maturity: Rate of Return (interest) expected if bond is held until maturity. (see Bond Calculations below)

Yield to Call: Rate of Return expected if bond is held until Call Date (assuming it is called on the call date).

Current Yield: Annual Coupon Payment (or interest payments) / Market Price (or quoted price of the bond).

Dividend Rate/Yield: Last dividend received / market price per share.

Dividend Payout Ratio: Annual Cash Dividend / Earnings Per Share.

Bond Calculations: Yield to Call = Find [I/Y], Yield to Maturity = Find [I/Y], Bond Price = Find [PV], Interest Rate/Return = Find [PMT]

Bond/Selling/Market Price[-]=-PV, Call Price/Face Value=FV (assume \$1000), **Coupon Payment**=PMT**, # of years=xP/Y [N]

****Coupon Payment:** \$1000, semi-annual, 10% coupon rate PMT=10% of \$1000 divided by 2 (b/c semi-annual)=\$50

Present Value of a Bond: PV of the Coupon Payment (an annuity, PMT) + PV of the Par Value (a FV). But Calc is easier!

Example: Par value=\$1000, Maturity Date = 5yrs, Annual Coupon Payments of \$100 (ie, 10%), Market Interest Rate = 8%

Calc: Set P/Y...PMT=\$100(10% of \$1000), FV=\$1000, Interest=8, N=5yrs, [CPT][NV] = \$1,079.86

If PV is less than Face Value, bond selling for a discount. If PV is more, bond selling for

a premium. If equal, bond selling At Par.

Value (PV) of a bond selling at discount increases the closer it is to maturity. PV of bond selling at premium decreases.

Stocks: EQUITY. Share in ownership (common), or profits (preferred, sometimes common) of a company. Preferred = A Perpetuity.

Shareholder Equity is affected by: Net Income, Net Losses, Payment of Dividends, Share Issuance, Repurchase of Shares.

Bankruptcy: Creditors first (least risk), Shareholders/owner's of the company last (they bear greatest risk)

Board of Directors: Leaders of the company. Power to decide whether or not to make a payment of dividends to common SH.

Common Stock: The "real owners" of the company. Invest money hoping for return (dividends/capital gains)...Not guaranteed.

Privately Owned, Commonly Owned (small group/family), Publicly Owned.

Can be sold with or without a par value. Sometimes a dividend is paid, sometimes not.

Voting, Non-voting, Supervoting (prevents hostile takeovers).

Pros: Few fin limitations on company, no maturity date, flexible in increasing co's borrowing capability. Increases assets/equity base.

Cost of Common Stock: See Gordon Growth Formula.

Cumulative Voting System: Each SH has one vote per director. Can use all votes for one, or distribute. Empowers minority SH.

Dividend: quarterly. Cash or Stock.

Cash Dividends: Most common type of dividend. Lowers equity/assets, taxable in the year paid. A form of investment interest/income.

Stock Dividends: "Scrip Dividends" Add Additional Shares, no change in liabilities, taxable only when sold. Lowers Par Value.

Stock Split: NOT A DIVIDEND. Division of outstanding shares among existing SH.

Share in equity stays same. Par value lowers.

Dividend Yield: Last dividend received / market price.

Gordon Growth Formula: AKA "**Constant Growth Formula**". Evaluates Common Stocks. Assumes constant growth forever (technic imposs).

Po = D1 / (Ks - G). Po=Price, G=Growth Rate, Ks=Req Rate of Return, D1 = The next dividend (Eg, $D1 = D0 * (1+G)$). D0 = The last dividend.

Example: Last Year's Dividend=\$1.00 (D0), Growth Rate=5%, Rate of Return=10%.

First: $D1 = D0 * (1+G)$... $D1 = \$1.00 * (1+.05)$... $D1 = \$1.00 * 1.05$... $D1 = \$1.05$

Second: $Po = D1 / (Ks - G)$... $Po = \$1.05 / (10 - 5)$... $Po = \$1.05 / 5\%$... $Po = \$21.00$

Therefore, if we want 10% rate of return on our money at 5% growth rate per year, we would be willing to pay \$21.00 for this stock.

Rate of Return: **$Ks = D1 / (Po + G)$**

Growth Rate: **$G = ROE * r$** . r = Retention Rate (Eg, If co pays 40% of income in dividends, retention rate = 60%)

Calc: [2nd][<|%][v] Enter Purchase Price[v] Enter Selling Price[v][v] Enter # of years[^][CPT] %CH= Annual Growth Rate.

Cost-sell Markup: **Calc:** [2nd][<|%], Enter original cost [OLD], enter selling price [NEW] compute [%ch]

Keynes Motives: Liquid Pref. Reas for cash/securities. **Transaction**(regular business), **Precautionary**(unexpected costs), **Speculative**(investment)

Majority Voting System: Each SH has one vote for each share owned.

Options: "Derivatives" Writer hopes stock price will go down, Stocholder hopes the price will go up.

Employee Stock Options: Bearer has right to to buy or sell stock at a set price for a given period of time (5-10yrs). Eg, Buy \$25, sell \$40

Call Option: Option ot **BUY**. Like a Stock Option but traded b/n investors instead of the corporation. **Chicago Board Options Exchange.**

Writer promises to **SELL** you X shares at Y price (regardless if stock is higher or lower on that day > Buyer pays Writer a non-refundable fee.

Writer hopes stock price will go down, Stocholder hopes the price will go up.

- Value increases with: higher stock price, higher risk free rate, volatility of stock

- Value decreases with: higher strike price, time closer to expiration

Put Option: Option ot **SELL**. Opposite of Call Option. Writer promises to **BUY** X shares at Y price from you (even if stock goes lower)...hedging!

Writer hopes stock price will go up, Stocholder hopes the price will go down.

Par Value: Arbitrarily assigned value placed on the stock in the firm's charter. Both buyer and seller agree to exchange stock at par value.

Preemptive Rights: SH can retain the same relative share of company even if new stocks are issued. Prevents dilution of ownership.

Preferred Stock: Like a bond...Pay equal dividends forever (expressed as a percentage or dollar amount). Common SH don't. **NO VOTE!**

Cost of Preferred Stock: $K_p = (D/NP) * 100$. D=Dollar Value of the Dividend, NP=Net Price (Current Selling Price - Floatation Costs).

Example: XYZ Corp issues preferred stock with \$5 dividend. \$75 par value and sold for \$72.25. Floatation cost is 3%of par. Find the cost?

1st find Floatation Costs ($75 \times 3\% = 2.25$), $K_p = 5 / 72.25 - 2.25 = 0.0714 \dots 0.0714 * 100 = 7.14\%$

If given dividend rate (instead of dollar value)...multiply dividend rate by par value **to find the dollar value of the dividend.**

Proxy: Signed statement by stockholder to pass his right to vote to another party. Overseen by SEC.

Treasury Stock: Retained/re-acquired/retired by Company. No dividends paid, no voting rights while held by company.

Stock Rights: SH can buy extra stocks in proportion to number of stocks they already own. Usually small Cos, closely/publicly owned.

Stock-purchase Warrant: Allows bondholder to purchase a certain number of shares at a set price during a certain period.

Capital Budgeting: Financial Managers. Process of evaluating and selecting a company's long-term capital assets (investments longer than 1yr).

When comparing potential projects, Financial Managers are really comparing NPV

Unsophisticated Methods: Don't consider TVM. Eg, Average Rate of Return (less accurate), and Payback Period (a little more accurate).

Average Rate of Return: Average profit after taxes for the duration of the project's life ÷

average investment (half the initial investment).

Project that exceeds company-set minimum, or one with highest Average Rate of return is accepted.

Payback Period: Calculates Time necessary for project to recoup initial investment (ie, cash inflows over time).

Project w/ payback period less than company-set maximum payback period, is accepted.

Cons: Ignores all cash flows beyond the payback period.

Last yr w/ neg Net Cash Flow (NCF) + Absolute Value of NCF in that yr (amount less than init inv) / Total Cash Flow in next yr.

Sophisticated Methods: Take TVM into account. Net Present Value (NPV), Profitability Index (PI), Internal Rate of Return (IRR).

A Capital Budgeting Decision should take into account: Project's Cash Flow, TVM, must lead to correct decision among Mutually Exclusive Projects.

NPV: PV of Cash Inflows - Initial Investment. If NPV = >0, project should be accepted (b/c cost of capital is less than the return).

NPV is the only method that ALWAYS leads to a correct decision when choosing among Mutually Exclusive Projects.

Calc: Enter all Cash Flows (CFs). Then hit [NPV], Enter Interest (cost of capital), Press Down Arrow, [CPT].

PI: Sum of PV of Cash Inflows ÷ Initial Investment. If PI <1, project should be rejected. PI = >1 means NPV will exceed \$0 (good).

IRR: Discount/Interest rate result in **NPV=zero** for a series of future cash flows. Ensures PV of Cash Inflows is equal to **Initial Investment**.

Measures the average annual yield of an investment.

Financial Manager should accept a project where the IRR is greater than the cost of capital (ie, Required Rate of Return)...profit?

Calc: Enter all CFs. Then hit [IRR], [CPT].

(PVIFA=Investment / cash inflow annuity amount)

*Lower Initial Investment = Lower IRR.

Intermediate Cashflows can conflict when using NPV (assumes reinvest at cost of capital) **and** IRR (assumes reinvest at rate = to projects IRR).

Discount Rate = When doing NPV, Risk Adjusted Discount Rate (RADR) = Rate of Return a project must earn to maintain/improve share price.

Certainty Equivalents (CEs): The portion of estimated cash inflows investors are happy to definitely receive v. cash inflows that are only "possible"

Capital Rationing: Limited budgets, so use **Investment Opportunities Schedule (IOS)** to graph IRR of competing projects in desc order v total investment.

Using NPV approach in capital rationing ensures project selected will maximize owner's wealth. Cap Rat: Reject projects w/ NPV of zero or above.

Capital Expenditure (CAPEX): Long-term investment where returns expected beyond 12 months.

Purpose: Expand, Replace, Renew fixed assets & commitment of funds for other activities to reap future gains (outdated equip, real estate)

Five Steps: Proposal, Review/Analysis, Decision Making, Implementation, Follow-up.

Two Types of CAPEX Projects: Independent (no relation to other projects), **Mutually**

Exclusive (rank projects b/c only one can be selected).

Budgeting Decisions: **Accept-reject** (project is either suitable or not), **Ranking** (compares investment options. Eg, Compare Rates). Rank=1-9(bad)

Cash-flow Patterns: Used to examine in and outflows of funds for an investment. Types: Conventional/Annuity, Unconventional, Mixed Stream.

Conventional/Annuity: Equal Payments at Regular Intervals.

Unconventional: Inconsistent stream of inflows (some payments are different from the rest).

Mixed Stream: Not an Annuity...cash inflows are varying (random).

Evaluating Cash Flows: Incremental Flows(extra in/out flows resulting from project), Initial Investment, Operating Cash Flow(after tax inflows).

Take into account...initial investment, after-tax inflows from new replacement asset, after-tax inflow from liquidation of old asset.

Initial Investment: Cost of new asset, cost of installing the new asset, and after-tax proceeds of the old asset (after-tax depreciation).

Recaptured Depreciation: Taxable as ordinary income. Difference b/w sale price and book value.

5yr Class can depreciate upto 20% in first year. 7yr Class=14%

Straight Line Depreciation: Cost / Life. Eg, Item costs \$500. Expected life is 5yrs. Annual Deprec = $500/5=\$100$ per yr.

Declining Balance Depreciation: More depreciation in beginning of life. Accelerated by a factor.

Eg, **Double Declining Balance Depreciation:** Item costs \$500. Expected life is 5yrs...factor= $2*(1/5\text{yrs})=0.4$ (20%).

Yr 1 = $500*0.4=\$200$ less. Yr 2 = $300*0.4=\$120$ less. Yr 3 = $180*0.4=\$72$ less...etc.

Project Risk: Scenario Analysis (behavioral), Sensitivity Analysis (behavioral), Statistical Analysis, Decision Tree, Simulation.

Statistical Analysis: Uses Expected Value (weighted average of possible results x probability of occurrence), Standard Deviation.

Simulation: Uses a variety of random variable as inputs for analyzing risk.

Cost of Capital: Takes into account: Cost of Debt, Cost of Equity, and must generate a rate of return at least equal to a similar investment.

Cost of Capital = The discount rate for NPV, or Required Rate of Return for IRR.

Target Capital Structure: Companies plan for an optimal mix of debt and equity financing...maximizes SH wealth.

Sources of Long-term Capital Financing: Long-term Debt (loans or bonds), Preferred Stock, Common Stock, Retained Earnings.

Cost of each source is measured on after-tax basis. B/c deals with after-tax cash flows from proposed investments.

Common Stock Financing (Equity): New Issuances of Common Stock, Retained Earnings.

Cost of Common Stock: Investors determines price of common stock in the marketplace by dictating the rate of return they require.

Evaluate cost of Common Stock using: (**See Notes under "Stocks"**) Gordon Growth Formula, or Capital Asset Pricing Model (CAPM).

Equity: Two Types: **Retained Earnings** (leftover after paid dividends), **Issuance of**

New Common Stock.

Long-term Debt: Cheaper than other types of long-term financing b/c interest is tax deductible. Bank Loans or Bonds (after tax).

Cost of Debt (After-tax): $k_i = k_d * (1 - T)$. k_d =before-tax cost of debt, T =company's tax rate.

New Issuance of Common Stock: Stock must be underpriced (below Market Price - P_o in order to be desirable).

Cost of New Issuance of Common Stock (K_n): $K_n = (D_1 / NP) + G$. NP =Selling Price - Floatation Costs, D_1 =dividend after 1 yr.

Preferred Stock Dividends: Paid before Common Stock Dividends. Tax exempt b/c paid from after-tax cash flows.

Cost of Preferred Stock: $k_p = D_p / N_p$. D_p =annual preferred stock dividend, N_p =net proceeds of the sale of preferred stock.

Retained Earnings: Withhold paying out dividends to re-invest in company. SH will only allow if expected return = R_{ofR} on stocks they own.

Cost of Retained Earnings (K_r): K_r must be equal to Rate of return on investment in stocks (K_s) $K_r = (D_1 / P_o) + G$

Weighted Average Cost of Capital (WACC): Average of the cost of debt and/or equity weighted by their usage in a given situation.

The overall ROE desired by all investors (stock and bond) in a company. Tests if projects are worthwhile (higher return than investment).

Calculate WACC by multiplying the cost of each source of financing by it's proportion in the capital structure, then sum the weighted values.

WACC is used as a co's Discount Rate for future capital budgeting decisions.

Weights can be calculated as book value (less accurate), market value (more accurate), or historic target.

WACC = $([Debt / D\&E] * [Cost\ of\ Debt * (1 - Tax)]) + ([Equity / D\&E] * Cost\ of\ Equity)$.
[D&E=Debt + Equity]

Example: Debt=\$300m, Equity=\$400m, Cost of Debt=8%, Cost of Equity=18%, Corporate Tax Rate=35%

$((300/700) * (0.08 * (1 - 0.35))) + ((400/700) * 0.18) = 12.5\%$

Valuation: process that connects risk and return to the worth of an asset.

An effective portfolio is one which provides highest expected return for a given level of risk, or lowest risk for a given expected return.

Risk: Quantifiable variability of returns from a specific asset. Both behavioral ("feel" about the risk) and quantitative approaches (probability).

Probability: Better measure of risk than behavioral (ie, sensitivity analysis).

Continuous Probability: A curve displaying all the values that random variables could take and the probability that each will occur.

Coefficient of Variability (CV): Measure SD/dispersion. **CV = Risk ÷ Return.**

Higher CV = higher risk, Higher SD = higher risk, Higher Variance = higher risk.

Neg Correlated Assets (\)-1: Mix NCAs to eliminate risk. Eg, Buy a company with high summer sales, to counter your high winter sales.

Pos Correlated Assets (/)+1: Diversification will not eliminate risk.

Uncorrelated Assets(curved) 0: Only some risk can be eliminated by diversification.
International Portfolio Diversification: Reduces risk. Foreign currency diversifies returns, foreign assets less impacted by local markets.

Total Risk: Firm-specific Risk + Market Risk.

Diversifiable/Unsystematic/Firm-specific Risk (strikes, loss of an account),

Undiversifiable/Systematic/Market risk (affects all firms).

Diversifiable Risks: Business Risk, Financial Risk, Default Risk

Undiversifiable Risk: Interest Rate Risk, Inflation Risk, Maturity Risk, Liquidity Risk, Exchange Rate Risk, Political Risk.

CAPM assesses risk by linking undiversifiable/systematic risk (**Beta**) with expected asset return.

[**Ks= Required Rate of Return. Km=Expected Rate of Return of Overall Market. Krf=Risk Free Rate. B=Beta**]

Relation b/w risk & return = **Security Market Line (SML): $K_m = K_{rf} + (K_m \text{ of market portfolio} - K_{rf}) * B$** .

Beta: Risk relative to overall market. A Beta of 3 means the company is three times more risky than the overall stock market (Beta = 1).

Beta of a risk-free asset = 0. BETA coefficients are estimates and therefore UNSTABLE!

Beta(B) = $(K_m - K_{rf}) / (K_m \text{ of market portfolio} - K_{rf})$.

Capital Asset Pricing Model (CAPM): Looks at systematic risk, expected rates of return, compares them to the overall stock market.

Required Rate of Return= Risk-free Rate + (Beta * (Market Return - Risk-free Rate))

Example: Risk-free Rate=5%, overall stock market will produce RofR of 12.5% next year, Company has a Beta of 1.7

Overall Stock Market has a Beta of 1 (so 1.7 is more risky..so you want a RofR more >12.5%.(b/c **more risk=expect higher reward**).

$K_s = 5 + 1.7 * (12.5 - 5) \dots = 5 + (1.7 * 7.5) \dots = 5 + 12.75 \dots = 17.75\%$

Therefore, if we invest in this company, we should get at least 17.75% return. Is it worth the risk? That's our decision.

Return: The change in value of an asset and any cash distributions (ie, dividends). Expressed as a percentage of the initial investment.

Expected Return on Stocks: $\text{Probability(as a decimal)} \times \text{Return or "Outcome"(as a percentage)}$ > do this for each state

Example: State #1 Prob=40% Return=5%, State #2 Prob=60% Return=10%... $0.4 * 5 + 0.6 * 10 = 8\%$

Multinational Corporation (MNC): Company that operates and possesses assets in more than one country.

Pros: New markets = new business opportunities = increased profits.

Cons: Multiple tax jurisdictions. International Taxation is critical part of MNCs business operations.

Exchange rates (value of investment can change w/ fluctuations), Political volatility, (assets may be seized, foreigners expelled etc.)

Eurobonds: Underwritten by international synd, offered simult to investors in multiple countries, no single country jurisdiction, foreign currency.

Eurodollars, Euroyen.

Euro Straight: Fixed-rate coupon Eurobond.

Convertible Eurobond: Eurobond that can be converted into another asset, often through exercise of attached warrants.

Dual-currency Issues (Eurobonds): Eurobonds that pay coupon interest in one currency but pay the principal in a different currency.

Euromarket: International market for borrowing and lending in currencies issued outside the originating jurisdiction = Less Govt regulation.

Euroequity: Stocks sold on more than one national stock market. MNCs can build international SH base.

Foreign Direct Investment (FDI): Transfer of capital, personnel, technical assets to a foreign country. Fully owned by MNC or joint venture with locals.

Hedging: Short-term cash management involves borrow/lend in foreign currencies, swapping assets with other parties. Offset risk of different currencies.

International Holding Companies: Usually formed for the purpose of anonymity and tax reasons (deliberately located in tax shelter countries).

Long-term Debt Financing: International bonds (sold outside country of borrower), foreign bonds, Eurobonds.

Mergers & Joint Ventures: Used by MNCs to increase growth, diversify, synergize operations.

International Transactions: In host country currency. If \$ appreciates, exporter loses, if \$ depreciates, importer loses.

Commercial Letter of Credit: From firm's bank, guaranteeing payment of invoiced amount. Makes international transactions easier.

Corporate Subsidiaries pay by "**netting**" paying only net amount. Cuts down on costs and charges.

Transaction Effects:

Payment of an Account Receivable = Assets 0, Liabilities 0, Equity 0.

Purchase of an Asset with a Loan or on Credit = Assets +, Liabilities +, Equity 0.

Increase in Accounts Payable = Assets +, Liabilities 0, Equity +.

Paying expenses with Cash = Assets -, Liabilities 0, Equity -.

Payment of a Cash Dividend = Assets -, Liabilities 0, Equity -.

Payment of a Stock Dividend = Assets -, Liabilities +, Equity 0.

Payment of a Utility Bill = Assets -, Liabilities -, Equity 0.

Payment of Wages = Assets -, Liabilities 0, Equity -.