A handbook of Corporate Finance and Investment Analysis

(50 Questions & Answers with Some Quantitative Problems Solved)

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Preface

This handbook is designed to help students new to corporate finance and may be investment analysis. It is intended to help students understand the concepts and calculations in financial management/managerial finance /corporate finance decisions. Most of the questions and problems in this book are valuable to students of corporate finance. The names of companies in this book are hypothetical. Some of the problems in this book are easy; some are interesting and a bit challenging. It is the hope and intention of the author (of this book) that users benefit immensely from it. Finance is a cornerstone of every business; therefore, a sound managerial finance is crucial in the business world. Although corporate finance is important, it is very complex. To God be the glory.

About the author

Sali is a professor of finance. She is a product of City University of NY (CUNY), St. John's University, and Walden University USA. She is a member of AFA, FMA, and National Society of Leadership & Success (NSLS).

Questions A-Z

a) Will an increase/decrease in interest rate affect WACC? Why or why not?

Ans: Cost of capital is like interest rate that a firm has to pay to acquire the capital needed to run its operations. WACC is the weighted average cost of capital for a firm. It is the average of a combination of a firm's borrowing costs plus its equity cost. The lower the WACC, the more valuable a firm is. If a firm's WACC decreases, its value will increase and vice-versa. Because interest rate is the cost of debt, if interest rate increases, then WACC increases; and when interest rate decreases, WACC decreases.

b) What does a decline in Earnings per share (EPS) mean to a company?

Ans: Earnings per Share (EPS), is one of the ratios used to value stocks. Therefore, if EPS is high, i.e. if it is above the benchmark index's EPS, the price of stock will go up. Investors will be happy. If EPS declines, this may cause the firm's stock price to go down, and investors may experience a loss.

c) What are the drawbacks of beta with regards to using CAPM to analyze risk?

Ans: Beta is a measure of a stock's volatility relative to the market. Although beta is a useful measure when assessing risk, it does not incorporate new information. Because of this, beta is unreliable to predict the future. It measures stock volatility relative to the market and not in general. It does not tell the whole picture about a company's risk; therefore beta should be used with caution.

d) If you were in charge of making decisions for your company as to issuing stocks or bond for raising additional capital, **which option would you choose? Why?**

Ans: Raising additional fund needed via stock issue could make a company loose some controlling power. A shareholder with 10% of the company shares may now own 7% due to the new stock issue. Earnings per share may also decline as there are more shares outstanding now to

dividend. This is called dilution of ownership. To issue stock, a company may have to disclose some crucial information publicly, which makes it possible for competitors to have access to it. Issuing debt requires the obligation of making regular fixed interest payments to the bondholders. Debt is riskier to a company than equity because the higher the debt a company carries; the riskier it is in the eyes of potential investors. Companies use debt to finance crucial but expensive projects that could help grow a business. Because the interest expense on debt is tax-deductible, tax liabilities for companies are reduced. Companies are attracted to using debt to finance projects because of this tax deductibility.

e) Bond price is inversely related to interest rate. Would you regard this statement as true or false?

Ans: This statement is true. When interest is high, bond price will be low. If interest rate is low, bond prices will be high. Consider a $1000 bond at 7% coupon. You will make $70 annual interest income. If interest rate falls to 5%, because new bonds are now being issued with a 5.0% coupon ($50 interest income), your bond, is now worth more than what you paid for it i.e. $1000- 50 = $950 compared to $1000-$70 = $930 [the lower the interest rate, the higher the bond price]. Hence, your bond will be trading at a premium but you have lower interest income i.e. $50 rather than $70.

Because interest rate is inversely related to bonds, when interest rate declines, bond price go up. At this time, it means investors will pay more for the bond and interest income is low. This condition is not motivating to investors

When interest is high bond prices fall. This condition is attractive to investors because they will pay low for the bond and earn high interest income. However, not all bonds react the same. The sensitivity of a bond's price to rising interest rates depends on the bond's term. Longer-term bonds are more sensitive to changes in interest rates than short-term bonds ceteris paribus.

f) What is market capitalization?

Ans: Market capitalization is the total market value of a company. It is calculated as current market price of a company’s stock multiplied by the number of shares outstanding.

g) What is book value?

Ans: The book value of an asset is its original purchase cost, adjusted for depreciation. It is the price of the asset as shown on the company's balance sheet

h) What does a high accounts receivable turnover indicate?

Ans: a high accounts receivable turnover indicates that a company's collection system is efficient. It means that its customers pay their bills on time. If a company's collection policy is too lenient, customers may hold on to accounts receivables for too long. And this action may interfere with a company's cash inflow. Anything that interferes with a company's cash inflow may push the company into distress.

i) What does an accounts receivable/inventory turnover of 1 or higher tells us about a firm?

Ans: Inventory turnover is the number of times inventory is sold or used in a given time period e.g. in the course of a year. It is the cost of goods sold or net sales divided by the average inventory. What an inventory turnover of 1 or higher tells depends on the industry. A slow turnover is typical of an automotive industry while a high turnover is expected in a fast-moving consumer goods industry such as retails. Accounts receivable turnover is used to measure how efficient a company is in collecting the money owed to it by its clients. What a receivable turnover of 1 or higher tells depends on the industry. A low receivable turnover may mean poor collection process. A high receivable turnover may mean that a company is conservative in giving credit to its clients.

j) What happens if investors ignore information they received about the market and stocks?

Ans: Nobody can predict what will happen in the market and there is no secret formula for beating it. If and when investors received information about the market and stocks, there is no way to know if the information is of value or not. There were warning signals before the 1929 market crash. There was an unsustainable rising stock prices and Economist Roger Babson in September 1929 predicted a market crash. Other economists brushed off fears of a reversal of the rising stock prices. In the spring and summer, the economy was on the high side, and the Fed was raising interest rates to slow a booming market. But in October, the market crashed by 25% on 2 consecutive days; and by mid-November, the stock market lost half its value.

In 1932, the market collapse hit rock bottom.

k) How would you, as a finance student, explain cash budget to your friend who does not have a background in finance?

Ans: Cash budget is the act of estimating the cash inflows and outflows for a firm for a specific time period. Cash budget is used to evaluate a firm to know if it is financially capable of operating its business. Cash budget is based on estimates; and most of the time, the actual figures deviate from the estimates. The deviation creates uncertainty in the cash budgeting process.

There are many factors that may cause uncertainty in the cash budget. Sales, expenses, and accounts receivable turnover are elements of uncertainty in the cash budget in any company. Seasonal cycle, inflation, political instability, etc. may also cause uncertainty in cash budget for businesses. Machine break down may cause a delay/stoppage in the production or delivery line. Because the actual figures can and do deviate from estimated figures, it is important that companies ensure they have a way of tapping into short-term financing. However, there are ways to mitigate the effects of uncertainty on cash flows. Incorporating methods of mitigating effects of uncertainty in the cash budget in a company's strategic plan is a good practice.

l) What do you think the loan officers could have done differently in 2007-2008 that could have prevented the financial crisis?

Ans: There were some early warning signals; which the Fed and Bush administration ignored. In 2006, it was reported that request for new home permits dropped by 28%, which was a signal that new home sales would drop. The Fed was optimistic that the strong economy could prevent a slump in the housing market. The Fed ignored the signal when short-term yield on Treasury notes were higher than the long-term yields. Long-term yields are normally higher than short-term yields to compensate investors for tying up their money longer. Interest rate was the lowest ever and the economists thought there was enough liquidity in the economy for it to fuel its growth. Banks were giving out interest-only loans to homeowners, which lower their monthly payments. As mortgage rates increase, house prices fell and homeowners were unable to make payments and could not sell their homes at a profit. Unregulated mortgage brokers made loans to people who were not qualified.

Mortgage-backed securities involve the securitization of a pool of assets that are sold as a package to investors such as pension funds and

insurance companies. These types of investors enable the risk from these securities to spread quickly through the economy. In 2007, banks were afraid to lend to each other for the fear of receiving mortgage-backed securities as collateral. By the end of summer, credit has become so tight that Fed had to loan $75B to banks to restore liquidity. Fed reduced interest rate to 2% from 5.75%. Fed's effort was not fruitful because banks were afraid at that time to loan to people. The unscrupulous mortgage brokers could have been regulated.

m) A company may finance its operations using debt or equity; or a combination of both. If and when a company increases its debt, what happens to its WACC?

Ans: A company will use debt and equity to finance its operations and grow. Debt financing enables rapid expansion. Using debt financing efficiently and effectively helps to increase revenue. Equity funds stimulate growth without requiring repayment. A company's capital structure can impact its value depending upon the effect of debt on WACC and or FCF. However, too much debt is not good. Too much debt can cause financial problem. Therefore, firms must endeavor to select an optimal capital structure, which best maximizes their company value and minimizes cost.

As debt increases, WACC decreases. However, at some point, diminishing return may set in and any addition to debt will result in an increase in WACC. When debt increases, investors panic and they may start to pull out their investment. This pull may result in share price reduction, reduction in company value, low stock price, and low EPS. For example, if debt is 40% of capital structure and equity is 60%, rd (rate on debt) is 5.4% and rs, (rate on equity) is 10.67%.

WACC = wd*rd + we*rs

= 40% (5.4%) + 60% (10.67%)

= **0.08566 OR 8.566%**

Let's say debt is increased to 50% from 40%; then WACC is:

WACC = wd*rd + we*rs

= 50% (5.4%) + 50% (10.67%)

= 0.027 + 0.05335

= **0.08035 OR 8.035%**

n) What are municipal bonds?

Municipal bonds are usually issued by the government. Municipal bonds are loans (deposits) the government (cities, counties, and states) received from investors to undertake projects. The interest paid on this type of bond is usually lower than what other investments offer. The interest paid to investors is usually tax-free to them (the investors) the tax-free feature is incorporated as an inducement to attract investors. This way, it is easy for the government to access the funds needed to undertake its projects. Because of this tax advantage, the end yield may be higher than the regular interest paid.

o) What is corporate bond?

Ans: Corporate bond is a bond issued by corporations to acquire funds needed for growth and or expansion. The interest paid on a corporate bond is usually higher than that on municipal bonds.

p) What is the difference between a corporate bond and a municipal bond?

Ans: Municipal bonds are issued by the government; corporate bonds on the other hand are issued by corporations. The interest paid on municipal bonds is usually lower than what other investments offer. The interest paid to investors on municipal bonds is usually tax-free. The interest paid on a corporate bond is usually higher than that on municipal bonds; and the interest paid on this type of bond is taxable at all government levels.

q) Which is better for an investor: receiving a stock dividend or stock repurchase?

Ans: Accepting a dividend distribution or a stock repurchase depends on individual preference. There are some investors who are looking for income to supplement their pay checks and some are interested in long-term capital gain. Companies repurchase stock with the intention of increasing value for the shareholders because stock is repurchased at a price higher than the going price. Stock repurchase is beneficial to the shareholders in that after the repurchase, the number of shares outstanding for the company is reduced this way, EPS is increased and so is the return on equity. Long-term capital gain may result from a stock repurchase. The capital gain on stock price increase may be deferred as it is paper gain unless if the shares are sold. Deferring this capital gain tax is an advantage for long-term shareholders. Cash

dividend is taxable when it is received. With the dividend, if they add it to their income, they may have to pay higher taxes. So, if they defer capital gain, they do not have to pay the tax on the gain until later when they are likely to be in a lower tax bracket. Stockholders may defer capital gain. Investors who are making enough income for themselves will still prefer the stock repurchase because of the tax deferral of the gain.

r) What is a bid-ask spread?

Ans: A bid-ask spread is the amount by which the ask price exceeds the bid price for an asset in the market. The bid-ask spread is essentially the difference between the highest price that a buyer is willing to pay for an asset and the lowest price that a seller is willing to accept to sell it.

s) What is liquidity ratio?

Ans: Liquidity ratio is a financial ratio that indicates if a company has enough current assets sufficient to meet its current obligations. Current ratio, quick ratio, and acid test ratio are examples of liquid ratio.

t) What is depreciation?

Ans: Depreciation is a tax-deductible expense and it reduces tax liability. Tax liability has a positive impact on cash flow. Depreciation is a non-cash accounting charge.

Depreciation spreads the expense of a fixed asset over the years of the useful life of that asset. Depreciation is added back into revenue when calculating a company's cash flow. This way, depreciation does not affect cash flow because it was initially deducted from taxable income when calculating a company's tax liability.

u) If you were an investor, which value would you reckon with; book value or market value? Why?

Ans: Market value and book value are the two common metrics used by investors to value stocks and bonds. Book value is the cost price adjusted for depreciation while market value is the price an investor will receive were s/he to sell the stocks in the open market. Book value is a recorded historical cost while the market value is based on the market demand and supply of the asset. Market value depicts the market perception of the company's asset. The book value of a business means the value of a business based on its statements (usually the balance sheet) Market value of a company is the market price per share of stock multiplied by the number of shares outstanding. It can vary at any point

in time and can be more or less than book value depending on the confidence the market has in the company. This is the value readily available to investors. The reason is because; the analysts and other financial experts recon with this value and is usually the value published in the newspapers. A comparison of the book value to the market value can help investors determine whether a stock is overvalued or undervalued.

Book value shows the actual/acquisition cost of an asset whereas market value indicates the current market price of the asset. An investor can calculate the book value of an asset based on a company's report about its earnings on a quarterly basis whereas market value changes every time. Book value is the sum of total assets minus the value of intangible assets.

v) What is coupon rate?

Ans: C**oupon rate** is the annual yield paid on a fixed-income security e.g. bond. It is expressed as a percentage of the face value of the security. For instance a bond with a $1000 face value that pays $50 annual return is a 5% coupon bond i.e. $50/$1000. A coupon rate is therefore, the interest rate paid on a bond by the issuing company to the bondholder. The coupon rate is fixed for the term of the bond i.e. it remains the same until the bond matures.

w) What is the different between interest rate and coupon rate?

Ans: Coupon rate is the annual yield paid on a fixed-income security e.g. bond. It is calculated on the face value of the bond which is usually $1000. Interest rate is the amount charged by the lender on the amount that is lent to the borrower. Interest rate is calculated based on the riskiness of the loan to the borrower. The coupon rate is decided by the issuer of the bonds while interest rate is decided by the lender.

x) What is yield to maturity (YTM)?

Ans: Yield to maturity is the discount rate at which the sum of all future cash flows from a bond (coupons and principal) is equal to the current price of the bond if it is held to maturity. It is expressed as an annual rate. It is assumed that the investor holds the security until it matures and that interest payments are made in a timely manner.

Formula: CF + ((Fv - CP)/n)/ ((Fv + CP)/2

Where CF is cash flow

Fv is face value

CP is current price

n is number of years to maturity

For instance a 10 year $1000 bond currently selling for $850 with a 15%

YTM is: $150 + (($1000-$850)/10)/ ($1000+$850)/2

$150 + ($150/10)/$925

($150 + $15)/$925

17.84%

y) What is a call option?

Ans: A call option is the right but not the obligation to buy a stock, bond, an asset, or an instrument at a specified price (strike price) within a specific time period. The buyer profits when the instrument increases in price.

z) What is a put option?

Ans: A put option is the right but not the obligation to sell a stock, currency, indexes, or an underlying asset at a specified price (strike price) on or before expiration i.e. within a specified time period.

Questions 1-24

1) **As a new investor who is trying to decide on whether to invest in common or preferred stock, which features would you look for to aid you in this decision-making?**

   Ans: The choice whether to invest in common or preferred stock depends on the preference of the investor. If an investor is looking for a fixed income on a regular basis, then preferred stock will be the best option. If one wants to have a say in the company, then common stock is the way to go. If one is risk-averse, then preferred stock is a better option. Common stock provides pre-emptive privilege to shareholders; which is a plus. Some factors to consider are: voting rights and pre-emptive rights for common stockholders, dividend income for preferred stockholders before common stockholders, common stock is more risky in the sense that if company fails, common stockholders may not get paid if there is not enough money to go around. It is always good to deal with an expert.

2) **Which is better: paying tax on dividends earned now or paying tax on capital gain earned in the future?**

   Ans: When there is a stock repurchase, shareholders may have to pay a long-term capital gain tax if they have held their stocks for longer than a year. The tax is usually 15%. If on the other hand the stock is held for less than a year, the gain is taxed at the individual income tax rate based on the investor's tax bracket.

   Investors enjoy dividend and market price appreciation (if there is any) on the stocks they purchase. However, the amount of dividend income received and its tax implications are important to an investor. Tax on dividends depends on the individual's tax bracket and if it is a qualified or non-qualified dividend. Stock repurchase is beneficial to the shareholders in that after the repurchase, the number of shares outstanding for the company is reduced this way, earnings per share (EPS) is increased, and so is the return on equity. Increased EPS may lead to an increase in price.

3) **If you were in charge of making decisions for your company as to issuing stocks or bond for raising additional capital, which option would you choose? Why?**

If debt is issued, the company will have to make fixed interest payments to the bondholders. However; the interest payment is tax deductible. If stock is issued, there will be a lot of expenses such as underwriters' fees, investment banker's fees, legal fees, etc. for the company. The company will have to disclose a lot of information to the public. Once the stock is issued, there will be an increase in the shares outstanding. This action will cause a dilution of ownership; and EPS will decline because more shareholders will have to share the profit available for distribution. A declined EPS is not attractive to potential investors.

4) **What are the implications of the US corporate tax reduction?**

Ans: The corporate tax reduction is beneficial to corporations and the country as a whole. Yes; it is an encouragement to businesses. It increases disposable income for individuals and profitability for businesses. Businesses could use the difference between the 35% and 21% to fund projects instead of going to borrow funds; thereby helping to improve economic development. They can also use it to pay bonuses to their employees. However; the reduction in tax income to the government will be made up somewhere else. Guess where? In property taxes and licensing. Property tax and licensing fees went up in 2018 already.

5) **What factors determine the spot rate?**

Ans: Spot rate is the price quoted on a security for immediate settlement. The rate depends on the value of the security at the time of the quote. The value of the security will depend on the price the buyer and seller are willing to pay/accept and the security's future market value. In other words, the spot rate is determined by the value of the security, the price the buyer and seller are willing to pay/accept and the security's future market value. The spot rate can therefore be a benchmark for the future rate.

6) **If the financial manager to a company did not strive to maintain an optimal capital structure what would be the impact on the company's capital expenditure and or growth?**

Ans: A firm's optimal capital structure is that capital structure that minimizes its cost of capital and maximizes its value. This capital

structure is measured by a firm's debt-equity ratio. Debt is a cheap source of capital for firms due to the tax deductibility of the interest payments on debt. Issuing equity is expensive and raising funds through equity means loosing some controlling power. Cost of debt is interest payment, while the cost of equity is dividends paid to investors. Both debt and equity financing impact a company's profit margins. However, the greater the debt, the riskier a firm is; and the riskier a firm is, the less attractive it is to investors. A financial manager would have to balance between financing with debt and equity. If a financial manager fails to strive for an optimum capital structure, cost will increase and profit may decline. If investors realize that things are not looking good, they may pull out their investment. If investors pull out, this may hamper growth, success, and sustainability for the company.

7) **If a company decided to issue additional shares of stock to raise the additional funds needed (AFN), assuming that its earnings remain the same, what impact will the new issue have on earnings per share (EPS)?**

Ans: If and when a company decides to issue stock in order to raise additional capital needed, the company must realize that the number of shareholders will increase. And if profit remains the same, earnings per share (EPS) will decline; because the existing shareholders will have to share profit with the new shareholders,. Because earnings per share are an indicator of a company's profitability, a company may have to take an alternative route in raising additional capital. If EPS declines, potential investors may not be attracted to the company. Existing shareholders may be dissatisfied.

8) **In a perfect market, the supply of funds will equal demand for funds. However, there are restrictions that may cause limitation, which may make the capital market imperfect. What kind of restrictions can you think of?**

Ans: When and if information is not disclosed quick enough to the market participants, demand and supply or buyers and sellers are not matched immediately. This condition may create an imperfect market. Also, in mortgage lending, the lender does not know the borrower; all he has is a bunch of documents about the borrower. The lender does not know for sure if the borrower will pay back the loan or not.

9) **Suppose you are planning to invest in a company. Upon looking at its liquidity ratio trend, you notice a decline; will you still invest in the company?**

Ans: Although declined liquidity ratio is a red flag, it is worthwhile to dig deep in order to find out how long the ratio has been declining and why. Further analysis will enable the investor to make an informed decision. Liquidity ratio is crucial to determine the ability of a firm to meet its financial obligations. However, this ratio cannot tell the whole story. The quality and composition of the firm's current assets are equally important.

10) **What is the difference between a money market and a capital market?**

Ans: Money markets and capital markets are a large portion of the financial market. They are used together to manage liquidity and risks. Capital market is a market where financial institutions collect fund on a long-term basis from clients and invest it in stocks, bonds, real estate etc. and make dividend/interest payments to the clients. Companies and governments issue stocks and bonds in the capital markets to raise funds needed for their operations. Money market is a market where short-term (of a year or less) securities are bought and sold.

Money market is used for borrowing and lending on a short-term basis while the capital market is used for borrowing and lending on a long-term basis.

Money market trading is done mainly via OTC (over the counter), which means there is little or no stock exchanges such as NY exchange or NASDAQ are involved. The capital market on the other hand involves stock exchanges. Money market provides businesses with short-term credit and plays a major role in providing liquidity in the economy over the short term. Money markets are informal whereas capital markets are formal. The Capital market is a dealer and an auction market, which consists of the primary and secondary markets. Money market involves financial institutions while capital market involves individual investors, brokers, underwriters, banks, insurance companies, and stock exchanges. Capital market deals in stocks, bonds, debentures, etc. while money market deals in T-Bills, commercial paper, promissory notes etc. Money market is liquid but capital market is less liquid. In the capital market, risk is high because of longer maturity and less liquidity of instruments; money market is less risky because of the liquidity. The

return on investment is low in the money market; in the capital market, return is higher because of the longer maturity and the high risk.

11) Is there an implied assumption in the calculation of the NPV or IRR?

Ans: The implied assumption in the calculation of the IRR is that a company will reinvest cash inflows at the IRR's rate (of return) for the lifetime of the project. Some people claim that the NPV has no reinvestment rate assumption; therefore, the reinvestment rate will not change the outcome of the project. However; some people assume that with the NPV, cash inflow can be reinvested at the required rate of return.

12) Do you think carrying debt as opposed to equity will help a company?

Ans: Debt is a cheap source of capital for firms due to the tax deductibility of the interest payments on debt. However, the greater the debt, the riskier a firm is; and the riskier a firm is, the less attractive it is to investors. Issuing equity is expensive although a firm will need to make interest payment on debt. Both debt and equity will help however; a company should strive for an optimal capital structure.

13) If a company has a high DPO (days payable outstanding), what effect could this have on the CCC?

Ans: Accounts receivable, accounts payable and inventory turnover contribute to the cash conversion cycle (CCC) CCC = DIO + DSO - DPO. A good management team should know how to manage the cash conversion cycle to have more value out of operating cash flow. DPO is the average amount in accounts payable divided by the cost of goods sold per day. Accounts payable is considered short-term debt. An example of accounts payable is when a company purchases inventory on credit. The longer a company can hold off on paying its accounts payable (credit) without interest, the more access it has to free cash. The more a company can extend payable days, the better the cash conversion cycle will be, because the company is paying for inventory without using cash. So the higher the DPO (without a penalty), the better the CCC.

14) Which of the capital budgeting techniques would you consider to be the best and why?

Ans: Capital budgeting is the planning process used to determine

whether an organization's long term investments such as new machinery is worth the funding.

If the cost of capital is higher than the required rate of return, a firm may decide against such investment. Some of the techniques used are: net present value (NPV), internal rate of return (IRR), Payback period, profitability index (PI), etc. A lot of people claim that NPV is the best capital budgeting tool. NPV considers the time value of money and the cash flow from the project. Some say NPV is the most accurate technique. Also, profitability and risk of the projects are given high priority in the calculation. IRR is not good for project with long maturity because it does not take into account changes in discount rate over a long period of time. Also, if the discount rate is unknown, IRR is not the best method. The payback period is good; but it does not consider cash flow after the payback period.

15) Looking at the time, the work, all the preparations, and the compliance that go with becoming a publicly traded company, would you recommend to a privately traded company to consider going public? Why or why not?

Ans: Going public means that a private company is becoming a publicly traded company. It is a transformational event for the firm. The decision to go public can be an important and challenging decision for that company. When a company is going public, it means that it is selling to the public for the first time, its shares that are formerly privately held. The general public then, has the opportunity to buy the company's shares for the first time.

Some financial experts identified initial public offering (IPO) as a re-start because as a previously private firm, it will now become a public company and will start doing things differently with limited flexibility. It is now in the public eyes. Some companies go public to raise the money for an acquisition. In the private market, a company deals with venture capitalists; while with the IPO, it deals with a lot of small investors who, each, owns a small percentage of the company.

When a company goes public, it can use the publicity as it enhances its reputation. A public company is more likely to receive the attention of newspapers, magazines and periodicals than private companies. High reputation may bring success. Stocks of publicly traded companies are usually valued higher than stocks of private companies. Other reasons why companies go public are to raise capital needed for expanding their

businesses, to diversify and reduce investor holdings, to attract and retain talented employees, and to provide liquidity.

Despite all the advantages of IPO, going public is not always the right or only answer to sourcing additional capital needed. As investment bankers want the securities they underwrite to be successful, they always look for companies that have outperformed their industries' average.

There is increased time pressure on public companies for reporting to security exchange commission (SEC) Underwriting costs, legal fees, filing fees, printing costs, compliance costs, and advisors' fees are expensive when going public. And the costs are not deductible on the statement. There is also a lot of paperwork.

When and if more than 50% of the firm's shares is publicly traded, the firm's founders lose control. Going public exposes firm to unsolicited acquisition threats. Shareholders expect sales, profits, market share, and product innovation to continue growing no matter what. This may create a lot of pressure for the company management. Once a company goes public, it may have to stay public as going back to being private is difficult and expensive. Publicly held firms are required to file quarterly financial reports with SEC; therefore, valuable information about a publicly traded firm is available to competitors. A company will therefore weigh the advantages and disadvantages of going public before making its final decision.

16) Is it possible for a firm's capital structure to impact its value? Why or why not?

Ans: Yes, it is possible for a firm's capital structure to impact its value

Capital structure tells how a company finances its operations. A company has to select the optimal capital structure to minimize its cost and maximize profit. A company will use debt and equity to finance its operations and grow. A company's capital structure can impact its value depending upon the effect of debt on WACC and or FCF. However, too much debt is not good. If the debt portion of the capital structure increases, chances are WACC will increase unless if the debt is issued at a low rate. If investors notice that a company has too much debt, they panic for the fear of default. And they may start to pull out their investment, which may result in share price reduction.

17) Why do you think investors are unable to process correctly the information they received about the market and stocks?

Ans: Finance models assume that investors are unbiased and well informed. Investors are assumed to take in information and make logical decision based on their preferences for risk and return. Behavioral finance indicated the possibility of less-than-perfectly-rational behavior that may cause common psychological and mental mistakes. Overconfidence in one's own abilities may cause errors in judgment. Investors may overestimate their abilities to guess right. Studies suggest that analysts are right about 40% rather than 100% of the time. Another reason why investors are unable to process information correctly is fear of regret; which may influence their decision-making. An investor may make decisions to minimize the potential regret that may result from his or her decision-making. Fear of regret may make an investor hold losing stocks too long and selling winning ones too soon.

Investors may use recent prices or recent earnings performance to predict future price or returns. An investor may avoid the stock of a firm that has been classified by most investors as a bad one or a loser; any changes in the firm's outlook may not change investors' minds about the stock. This is called representativeness by psychologists. Investors may be shortsighted in their choices about gambling on stocks because it (gambling) involves potential losses.

18) As the store supervisor/ inventory manager would you recommend the just-in-time system of inventory management for your company? Why or why not?

Ans: Just-in-time (JIT) inventory management is a strategic inventory management that enables goods to be received as needed in the production line. It is sometimes referred to as lean manufacturing in the manufacturing industry. This system enhances efficiency, reduces waste, and inventory costs. The companies that use this system do not carry stock on hand to meet demand; rather, stocks arrive as they are needed. An example of companies that use JIT system is General Motors. Just-in-time requires that the company forecasts its need accurately. The drawback is that if there is a defective stock, then there may be a delay or disruption in the production line.

19) What can you tell your friend (who is not a business major) about IPO?

Ans: An IPO or initial public offering is the process by which

companies, usually private companies, offer their stock for the first time, to the public for purchase. A company usually uses IPO to raise capital from public investors. A company that elects to go public will have to choose an investment banker that will be the underwriter and an exchange where the shares will be issued and traded. During the 2008 financial crisis, there was a halt to IPO. When a private company is mature enough (with a $1B value) it can begin to advertise its interest to go public. An IPO is a big step for a company as its stock is listed on the stock exchange and is able to raise a lot of fund for growth and expansion. When a company goes public, it has to file some documents with the security exchange commission (SEC), which discloses some information about the company to the public. The filing has to be done quarterly afterwards. This transparency and the listing on the exchange enhance a company's reputation, exposure, and prestige. On the other hand, IPO could be very expensive and the quarterly reporting may disclose information about the company to its competitors.

20) What can you tell your friend (who is not a business major) about acquisitions?

Ans: Acquisition is a process of consolidating companies and or assets through financial transaction. A company takes over another and becomes the new owner. The company that is taken over ceases to exist. The acquired company is purchased with cash, stock, or a combination of the two.

21) If bond price falls, what do you think will happen to interest rate?

Ans: If bond piece falls, interest rate will rise because, bond price has an inverse relationship with interest rate.

22) Is the gross profit or the gross profit margin a good indicator of a company's profitability?

Ans: No. This is because neither of these two elements considers a company's operating expenses, interest payments, and taxes. To know a company's true profit, operating expenses, interest payments, and taxes have to come into the equation. Either of them is a good measure though.

23) What are the factors that might cause a reduction in business specific risk?

Ans: Specific risk, as opposed to an overall market risk, is a risk that affects a small number of businesses or market. As its name suggests, it

is a risk that is very specific to a business, market, or small group of businesses/markets. It is also referred to as diversifiable risk or unsystematic risk. Specific risk may be reduced by diversification. An investment company may reduce specific risk by holding a variety of stocks from different sectors of the economy in its portfolio. A company may also organize a risk management team to identify and help manage specific risks.

24) Of all the reasons/theories of organization restructuring, which one would you consider the most common?

Ans: Some of the reasons for restructuring an organization are: to reduce costs, incorporate new technology, concentrate on new products, improve competitive advantage, merge with another company, decrease or consolidate debt, spin off a subsidiary company, and make better use of talent. One common reason for restructuring an organization is to downsize the workforce. A downturn in the economy and competition from competitors may force a company to think of new operating strategies or change its product mix, which may lead to staff redundancy. Downsizing may cause shorter communication channels, new system, and broader job descriptions.

Quantitative Problems

Chapter - 1

Review of Accounting

1.1) Oni & Sons Co. has $8M in sales revenue, 100,000 common shares, and 8,000 preferred stocks outstanding. The preferred stock is with $3 annual dividend per share, Its payout ratio is 60%.

You are also given the following information about the company.

Cost of goods sold $5M

Administrative expenses $1.5M

Depreciation expenses $150,000

Interest expense $100,000

Calculate the company's i) Gross profit, ii) Operating profit. iii) EBT, iv) Taxes, v) Net profit, vi) EPS, vii) Dividend per share.

Oni & Sons Co.

Income Statement

For the Year Ended Dec 31, 2018

Sales $8,000,000

Cost of goods sold $5,000,000

Gross profit $3,000,000

Admini Expenses $1,500,000

Depreciation expenses $150,000

Operating profit $1,350,000 i.e. $3M-($1.5M+$150,000)

Interest expense $100,000

EBT = ($1,350,000 -$100,000) $1,250,000

Taxes = 40% ($1250,000) $500,000

Net profit = ($1250000-$500,000) $750,000

Preferred dividend is: $3(8000) $24,000

Profit available for common stock $726,000 i.e. $750000 - $24000

EPS = $726,000/100,000 = **$7.26**

Dividend per share = (0.6($726000))/100,000

= $435,600/100,000

= $4.36

Chapter - 2

Financial Analysis

Financial analysis is the process of assessing a business or project to determine its performance, solvency, and or stability. The findings from this assessment will help one to decide if the business or project is worth investing in or make recommendations for improvement. There are five key elements to a financial analysis: a) revenue, b) profit, c) liquidity, d) capital efficiency and solvency, and e) operational efficiency.

Revenue is the major source of cash from sales or service. The amount of revenue a firm has can determine its success and or sustainability.

Profit

If a firm cannot operate profitably, it may not survive. Profit ratio may be expressed as gross profit margin (revenue - cost of goods sold)/revenue), net profit margin (revenue - cost of goods sold - operating expenses - other expenses)/revenue, operating profit margin (revenue - cost of goods sold - operating expenses)/revenue.

Liquidity

Liquidity analysis is assessing a firm's ability to generate sufficient cash to meet cash expenses. It is not good for a firm to have poor liquidity even if revenue and profits are increasing. Current ratio, liquid ratio, and interest coverage ratio are some of the ratios used to measure a firm's liquidity. Current ratio measures a firm's ability to meet its short-term financial obligations. A ratio of 1 is the minimum acceptable. Interest coverage ratio measures a firm's ability to pay its interest expense from the cash generated from the business. A ratio of 1.5 is acceptable.

Capital Efficiency and Solvency

Return on equity (ROE) and debt to equity ratios are two ratios used to measure capital efficiency and solvency. Return on equity is net income/shareholder's equity. Return on equity of between 15-20% is considered good. Debt to equity ratio shows how much leverage a firm is using to operate its business. A ratio of 1 to 1.5 is considered good. Banks or

lenders in general and investors are very much interested in capital efficiency and solvency of companies because this element tells them if a firm can repay its loan(s)

Operational Efficiency

Operational efficiency measures how well a firm is utilizing its resources. It's how quickly a firm can sell its inventory and keeps its costs down. The two ratios used to measure this are inventory turnover (cost of goods sold /average inventory) and accounts receivable turnover. Inventory turnover measures how efficiently a firm manages its inventory. A low inventory turnover ratio indicates that the firm has low sales. The higher this ratio is, the better the operational efficiency. Accounts receivable turnover shows how efficient a firm is at collecting credit sales invoice. It is net credit sales divided by the average gross receivable. The receivable turnover can also be expressed in days. The fewer the days, the faster a firm collects what is owed to it.

Below are some quantitative problems:

2.1) Using the information below for Apex corporation, calculate the sales revenue, gross profit, EBIT, EBT, taxes, and net income.

Cost of goods sold $1.5M

Admini expense $150,000

Interest expense $50,000

Times interest earned 4

Gross profit margin 20%

Tax rate 40%

i) Sales revenue is:

Because gross profit is 20%, cost of goods sold is therefore 80%.

$1,500,000 = 80X

$18,750 = X i.e. divide both sides by 80

Sales revenue is 100X

= **$1,875,000** i.e. 100($18,750)

ii) Gross profit = Sales revenue - cost of goods sold

= $1,875,000 - $1,500,000

= **$375,000**

iii) To find EBIT

Times interest earned = EBIT/interest

4 = EBIT/$50,000

EBIT = 4($50,000) by cross multiplying

= **$200,000**

iv) EBT = EBIT – interest

= $200,000 - $50,000

= **$150,000**

v) Taxes = 40%($150,000)

= **$60,000**

vi) Net income = EBT - Taxes

= $150,000 - $60,000

= $90,000

2.2) Sally and her sister Shade are in the novelty business making figurines as gifts for sale. They borrowed $10000 from their bank at the rate of 7%. Their tax rate is 40%. Their variable cost (VC) is an average of $8.00 per unit and fixed cost (FC) is $5000. They had priced each figurine $10.00.

a) Calculate their operating breakeven point.

Qb = FC/ (P – VC) where Q is the quantity, Qb is the breakeven point value, FC is fixed cost, P is price, and VC is variable cost.

= $5000/ ($10 - $8)

= $5000/2

= $2500

b) What quantity of figurines will result in an EBIT of $4,000?

EBIT = (P*Q) – FC – (VC*Q)

$4000 = (10*Q) - $5000 – (8*Q)

$4000 =10Q - $5000 – 8Q

$4000 + $5000 = 10Q – 8Q

$9000 = 2Q

$4500 = Q

c) What will be their after-tax loan rate?

After-tax rate = 7% (1- tax rate)

= 7% (1 - 0.40)

= 0.07 (0.60)

= 0.042 OR 4.2%

Chapter - 3

Financial Forecasting

Financial forecasting is the process of predicting the future performance of a business. A comprehensive way of predicting performance is developing pro forma statements. The forecast should be simple but realistic. Forecast revenue; then gross margin as a percentage of revenue. Overhead cost and administrative cost are forecasted as a percentage of revenue; all income statement input including expenses are forecasted as a percentage of sales. Looking at a company's historical data will help in the forecast. However; other factors such as economies of scale, cost of input, leaving room for human error, etc are also crucial.

3.1) Your company projected a 20% increase in sales for 2020. Compute the additional funds needed (AFN) to support the sales increase using the information below.

Asset/Sales = 40%

Net profit margin = 3%

Payout ratio = 50%

2018 sales = $6M

Spontaneous Liability/Sales = 20%

$AFN = A/S_0(\Delta S) - L/S_0(\Delta S) - MS_1(RR)$

Where A is Assets tied to sales

S_0 is previous year's sales

S_1 is projected sales

M is profit margin

RR is retention rate

AFN = 40% (ΔS) – 20% (ΔS) - 3% (S_1) (RR)

ΔS is 20% ($6M), S_1 is $6M (1+20%), RR is 1- 50%

AFN = 0.4($1200000) - 0.20($1200000) - 0.03($7200000) (0.5)

= $480000 - $240000 - $216000(0.5)

= $480000 - $240000 -$108000

= **$132000**

Chapter - 4

Sources of Short-Term Financing

Some of the sources for short-term financing are accounts payable, accounts receivable, early payment discount, line of credit, etc. A company can delay paying its accounts payable or expedite its accounts receivables and use the money to finance its operation for a short period of time. It can also give early payment discount to its clients so it can collect money owed to it quick and have it available to run its business. It may keep inventory at minimal so the money is available as working capital. The best sources are accounts receivables, accounts payable, and inventory.

A firm may arrange that credit extended to it by its suppliers. The firm's credit-worthiness and its suppliers' confidence are the main basis of securing such trade credit. The supplier sends the goods to the firm and payment is made in the future. Another source of short-term financing is installment credit. In this case, the supplier sends the goods to the firm and the firm pays by installment. Some firms receive advances from their customers and agents against orders placed. These advances can be used by the firm to run its business until it is ready to send shipment. Accrued expenses such as taxes and interest also serve as a short-term financing source. An overdraft protection on a firm's bank account is another source of short-term financing. The bank will allow the firm to draw over and above the amount in the firm's bank account. This privilege is for a short period of time and the firm pays interest on the amount overdrawn. A firm may arrange for hypothecation of its inventory with its bank for the provision of working capital. The hypothecated inventory is a security for the short-term loan although the firm does not give possession of the inventory to the bank. In India, some manufacturing and non-bank financial companies in the private sector accept fixed deposits from the public. The interest paid by firms on these deposits is lower than what the banks would charge. Some government companies started accepting deposits from the public since 1980.

4.1) PNC Co. orders materials for its production line from Merlite Supply Inc. Merlite gives PNC a payment discount as 2/15 net 40. Calculate the cost of not taking the discount.

Cost of not taking the disct = (disct %/(100%- disct %)) x (360/(due date-disct period))

= (2%/(100%-2%)) x (360/(40-15))

= 2%/98% x 360/25

= 0.0204 x 14.4

= **0.2938** OR **29.38%**

Chapter - 5

Time value of money

The concept of time value of money is that money today is worth more than the same amount in the future due to the fact that it can earn interest. Money is worth more the sooner it is received. Also, there may be a risk in waiting to receive the money in the future. The basic formula is: $FV = PV [1 + (i / m)]^{(nm)}$

$PV = FV/(1+i)^n$

Where FV = future value

PV = present value

i = interest rate

n = the number of years

m = number of compounding periods per year

When interest is compounded, the frequency of compounding can impact the value of the loan or investment. For instance a $1000 investment for 5years at 5% interest compounded quarterly will be

$FV = PV[1 + (i / m)]^{(nm)}$

$= \$1000[1+0.05/4)^{5(4)}$

$= \$1000[1+ 0.0125]^{20}$

$= \$1282.04$

If interest is compounded monthly, FV will be:

$FV = \$1000[1+0.05/12)^{5(12)}$

$= \$1283.36$

This formula may change slightly in the case of annuity or perpetual payments.

5.1) Tammy deposits$2500 into a savings account that pays 8% annual interest rate. How much will she have in the account at the end of the 10^{th} year?

FV = PV (1+i)^n

= $2500(1+0.08)^10

= $2500(2.1589)

= $5397.31

OR using the FV factor at the end of a finance book (in the appendix)

$2500(2.159) = **$5397.5**

5.2) You invested $1,000 today at 7% interest compounded annually. How much will you have at the end of 3 years?

$FVn = PV(1 + r)^n$

$FV_3 = \$1,000\ (1 + .07)^3$

= $1000(1.225043)

= **$1225.043**

5.3) An investment that is earning 10% annual interest rate is worth $5,000 at the end of 5 years.

How much do you have to put in today?

$PV= FVn/(1 + r)^n$

$= \$5000/(1.10)^5$

= **$3104.61**

5.4) You plan to retire in 20 years; and want a 401K that will pay you $20000 every year for 30 years after retirement. The interest rate is 11%; how much should you have in the 401K when you retire to achieve this goal?

$PV= (CF/r)(1-(1/(1+r)^n$

$= (\$20000/0.11)(1-(1/1.11)^{30}$

= ($20000/0.11)(1-(1/22.89229)

= ($20000/0.11)(1-0.043682)

= ($20000/0.11)(0.9563)

= $181818.18(0.9563)

= **$173872.73**

Or you can use Excel with this formula PV (11%,30,20000,0,0)

5.5) How much will you need today to provide the $173872.73 if you earn 9% per year during the 20 years before retirement?

CF= FVn / (((1+r)^{n} -1) / r)

= $173872.73/((((1+0.09)^{20})-1)/0.09)

= $173872.73/(((5.6044)-1)/0.09)

= $173872.73/((4.6044)/0.09)

= $173872.73/51.1601

= **$3398.60**

5.6) ABC Company is considering purchasing an equipment costing $200,500. The equipment is expected to generate a yearly cash flow of $67000; its life span is 4 years after which it will be sold for $25,000. The discount rate is 12%. What is the present value of this project?

PV of project = PV of CF + PV of salvage value.

PV factor for annuity @ 12% 4years is 3.037

PV factor @ 12% 4 years single pymt is 0.636

PVof CF is: 3.037($67,000) = $203,479

PV of salvage value is: 0.636($25,000) =$15,900

Total PV = ($203,479 + $15,900) – initial cash outlay

= $$219,379 - $200,500

= **$18,879**

5.7) You borrowed $15,000 at a 14% annual rate of interest and the loan is to be repaid over 3 years.

a) Calculate the yearly payment.

PMT = [{P[r(1+r)^n]} / [(1+r)^n-1]

= $15000[0.14(1+0.14)^{3}]/(1+0.14)^{3}-1]

= $15000[0.14(1.4815)]/(1.4815-1)

= $15000(0.2074)/0.4815

= $3111.24/0.4815

= $6461.56

b) Prepare an amortization table for the loan.

Payments

Year	Beginning of year principal	Loan payment	Interest	Principal	End-of-year principal
1	$15,000	$6,460.97	$2,100	$4,360.97	$10,639.03
2	$10,639.03	$6,460.97	$1,489.46	$4,971.51	$5,667.52
3	$5,667.52	$6,460.97	$793.45	$5,667.52	$0.00

$2100 = 0.14($15000)

$1489.46 = 0.14($10639.03)

$793.45 = 0.14($5667.52)

Principal = loan payment - interest

5.8) a) What is the future value of a 7%, 5-year ordinary annuity that pays $300 each year?

FV = PMT [((1 + r)n - 1) / r]

= $300((1.07)^5 – 1)/r)

= $300((1.4026-1)/0.07)

= $300((0.4026)/0.07)

= $300(5.7507)

= $1725.21 *Payment is at the end of the year.

b) If this were an annuity due, what would its future value be?

FV = (PMT [((1 + r)^n - 1) / r])(1 + r)

= $300(((1.07)^5 – 1)/r) (1.07)

= $300((1.4026-1)/0.07) (1.07)

= $300((0.4026)/0.07) (1,07)

= $300(5.7507) (1.07)

= $300(6.1533)

= $1845.99 *Payment is at the beginning of the year.

5.9) An initial $500 compounded for 10 years at 6%

P [(1 + ***i***)^n – 1] + P

$500((1.06)^{10}-1) +P

$500(1.7908 – 1) +P

$500(0.7908) + P

$395.42 +$500

$895.42

5.10) Tom borrowed $1200 at 9% interest rate to go to college. He is to pay $1500 a year after graduation. How long will it take him to pay off the loan?

$$N = \frac{-\log(1 - iA/P)}{\log(1+i)}$$

= [-log(1-0.09(12000/1500)]/log(1.09)

= -log(1-0.09(8)/log(1.09)

= -log(1-0.72)/log(1.09)

= -log(0.28)/log(1.09)

= 0.5528/0.0374

= **14.78 years**

Or you can use the amortization table.

Yr	Balance at the beging of yr	Pymt	Interest	Principal	Balance at the end of yr
1	12000	1500	1080	420	11580
2	11580	1500	1042.8	457.8	11122.2
3	11122.2	1500	1000.99	499	10623.2
4	10623.2	1500	956.09	543.91	10079.9
5	10079.29	1500	907.14	592.86	9486.43
6	9486.43	1500	853.78	646.22	8840.21
7	8840.21	1500	795.62	704.38	8135.83
8	8135.83	1500	732.22	767.78	7368.05
9	7368.05	1500	663.12	836.88	6531.17
10	6531.17	1500	587.81	912.19	5618.98
11	5618.98	1500	505.71	994.29	4624.69
12	4624.69	1500	416.22	1083.78	3540.91
13	3540.91	1500	318.68	1181.32	2359.59
14	2359.59	1500	212.36	1287.64	1071.95
15	1071.95	1168.43	i.e.	1071.95(0.09) + 1071.95	

With the amortization, it is 15years.

****5.11)** You are 45years old and wish to retire in 20years after accumulating $2M in your 401k account. a) How much must you save every year to achieve your goal if you can earn 10% on the account? b) If you decide to deposit $30,000 every year at 17% to accumulate the $2M, for how many years must you work before you can retire?

a) $2M = A x $FV^{(n = 20, i = 10)}$

Looking at a finance book appendix under FV annuity 20years at 10%

$2M = A x 57.275

$2M/57.275 = A (dividing both sides by 57.275) OR putting like terms together.

$34919.25 = A

b) FV_A = Ax FV

$2M = $30,000 x $FV^{(n = ?, i = 17\ \%)}$

$2M/$30,000 = FV (dividing both sides by $30,000) OR putting like terms together.

66.67 = FV

Looking at a finance book appendix under FV annuity at 17%, it will be approximately 16years.

Chapter - 6

Operating & Financial leverage

Leverage is borrowed capital used as a funding source when a company is planning to expand or grow. There are two types of leverages; financial and operating leverage. Financial leverage is the amount of debt used to finance a company's operations. Operating leverage is how a company's costs are structured and used to determine its break-even point. The break-even point is the point at which the profit generated from sales covers both the fixed costs and the variable costs. A company that needs a lot of plant and equipment for operations will have a high operating leverage. A high operating leverage may increase the risk of cash flow problems. If a company has higher variable costs than its fixed costs, then it is using less operating leverage. And the reverse is true if the fixed cost is higher.

6.1) You graduated from college 3 years ago. Your efforts to secure a job in your field were fruitless; so, you decided to start a business with your friend making tree trimmers. You projected your fixed cost to be $50,000, the variable cost as $30 per trimmer, depreciation expense is $15K a year and each trimmer would be sold at $70.

a) How many trimmers do you have to sell to break even?

b) What will be your breakeven point in sales dollar?

c) What will be your cash breakeven point?

d) How many trimmers must you sell to make $20,000 profit?

e) What will your operating leverage be if you sold 1500 trimmers?

a) Break Even point (BE) = FC/P-VC

BE = $50,000/$70- $30

BE = $50,000/$40

BE = **1250 units**

b) BE sales i.e. BES = FC/1- (TVC/S) where TVC is total variable cost and S is the sales revenue

BES = $50,000/(1- (37500/87500))

$37500 is $30(1250 units) and $87500 is $70(1250 units)

BES = $50,000/(1 - 0.43)

BES = $50,000/0.57

= $87719.30

c) Cash Break Even point (Cash BE) = FC- non-cash FC/(P-VC)

There is non-cash fixed cost such as depreciation.

Cash BE = $50,000 – depreciation/($70 - $30)

= $50,000 - $15,000/$40

= $35,000/$40

= **875 units**

d) FC + $20,000/(P – VC)

$50,000 + $20,000/$70 - $30

$70,000/$40

1750 units

e) Degree of operating leverage (DOL) = Q(P-VC)/Q(P-VC)-FC

DOL = 1500($70 - $30)/ (1500($70 - $30)) - $50,000

= 1500($40)/(1500(40)) - $50,000

= $60,000/$60,000 - $50,000

= $60,000/$10,000

= 6

Degree of financial leverage (DFL) = EBIT/EBIT-I

Degree of combined leverage (DCL) = S - TVC/ S - TVC - FC-I OR

Q (P-VC)/Q(P-VC)-FC-1

Chapter - 7

Working capital & Financing decision

Working capital is the capital that a company uses in its day-to-day operations. It is calculated as the current assets minus the current liabilities. It measures a company's ability to meet its short-term financial obligations. A company can increase its working capital by selling more of its products. Having a positive working capital is crucial because a negative working capital indicates that a company is not using its assets effectively, and may experience a liquidity problem; which may result in low credit rating. Low credit rating will make creditors charge high interest rate. Capital intensive companies may have difficulty in keeping sufficient working capital on hand to meet its short-term financial needs. This is because they order inventory a few months in advance and sell on a long-term payment basis.

The amount of working capital a company needs to keep depends on its size and volatility of its business. A big company requires more working capital than a small company. A rule of thumb is that a company keeps between 15-25% of its gross revenue as working capital. To maintain a strong cash position, a company has to reduce expenditures that do not increase production.

7.1) For every $4 of sales generated, your company needs $1 current asset. Profit margin is 8%, sales is $200,000 and is projected to increase to $350,000. There is no change in fixed asset. What amount of external financing is needed to support the sales increase if retention rate is 100%?

AFN = $A/S_0(\Delta S)$ - MS_1 (RR) OR AFN = $A/S_0(\Delta S)$ - $L/S_0(\Delta S)$ - MS_1 (RR)

Where A is assets, S_0 is sales at time zero, S_1 is sales at time$_1$, ΔS is change in sales, MS is the profit margin, RR is retention rate

= ¼($350000 - $200000) - 8%($350000)(1-0)

= ¼($150000) – 0.08($350000)(1)

= $37500 - $28000

= **$9500**

Chapter - 8

Current Asset management

As the name suggests, current asset management is the management of the current assets of a firm i.e. cash, accounts receivables, marketable securities, and inventory. It is an extension of working capital management. Current assets are assets that can be easily sold or used in a business operation and can be converted to cash within a year; in other words, the liquid assets. The less liquid an asset is, the higher the required rate of return.

Current asset management includes cash management, inventory management, and credit policy. These assets are normally listed in the order of liquidity i.e. assets that have greater chance of being converted into cash quickly are listed first. Firms use their current assets to fund their business operations and pay for expenses.

8.1) A firm has sales revenue of $12M and an inventory turnover ratio of 2. The firm decided to implement a new inventory system to enhance its turnover ratio. If the new system increases the turnover ratio to 4 but sales remains the same, how much cash is freed up?

Previous sales is: $12000000

Previous Turnover rate is: 2

Inventory level = $12000000/2

= $6000000

New sales is: $12000000

New Turnover rate is: 4

New Inventory level = $12000000/4

= $3000000

Cash freed up = $6000000 - $3000000

= $3000000

8.2) R&D LLC has an average daily collection of $50K. You, as the financial manager, propose a new collection system that could reduce the

collection period by 2 days.

a) How much cash would the new system free up for R&D?

Cash freed up = 2($50K)

= **$100,000**

b) If it can earn 5% on the cash freed up by the new system, how much should R&D be willing to pay for the system?

Amt to pay for new system = 5% ($100,000)

= 0.05 ($100,000)

= $5000

8.3) ABC Corporation purchases 1,000,000 units per year of an item. The fixed cost per order is $25. The annual carrying cost of the item is 25% of its $2 cost.

Determine the economic order quantity (EOQ) if (a) the order cost (O) is $1 rather than $25, and (b) if the order cost is $25 but the carrying cost (C) is $0.01.

a) EOQ = sqrt((2*S*O)/C)

= sqrt (2*1000000*1)/$0.50)

$0.50 is 25% of $2

= sqrt (2000000/0.5)

= sqrt(4000,000)

= 2000

b) EOQ = sqrt((2*S*O)/C)

= sqrt((2*1000000*25)/$0.01)

= sqrt(50,000,000)/$0.01)

= 70710.68

Chapter - 9

Cost of capital

Cost of capital is the opportunity cost of the alternative forgone. It is the rate of return offered to an investor to attract him/her to invest. It is the required return that makes a project worthwhile. This return is offered to compensate an investor for the risk s/he is willing to take by investing in a company's security. It is the return an investor expects to receive for providing funds to a company. This return is the cost of that security to the company that issued it. A company's overall cost of capital is the total compensation given to all creditors and stockholders. This is the weighted average cost of capital i.e. the average cost of debt and cost of equity blended together.

9.1) Cost of Capital

ABC Corporation's common stock has a beta of 1.2. The risk-free rate is 6% and the market return is 12%.

a. What is the risk premium?

Risk Premium= rm - Rf

= 12% - 6%

= 6%

b) What is the required return on the common stock?

rs = Rf + [b(Mr - Rf)]

= 6% + 1.2(12% - 6%)

= 6% + 1.2(6%)

= 6% + 7.2%

= 13.2% OR 0.132

9.2) Cost of Capital

A firm's common stock is currently selling for $55 per share. The expected dividend for the end of the coming year is $5. Its dividend payout ratio is approximately 60% of earnings per share. To attract buyers, new

common stock is under-priced by $10 per share. The firm also paid $3 per share in flotation costs. Its 8% (annual dividend) preferred stock with a par value of $100 is sold for $65. And $2 per share is paid to the underwriters.

a) Calculate the cost of preferred stock.

Rp = Dp/Np

Where Dp is dividend on preferred stock and Np is the price.

= 8% ($100)/$65-$2

= $8/$63

= 0.126984

b) Calculate the price of common stock.

$r_s = D_1/[P_0(1 – F)]+ g$ [Including floatation cost]

P_0 = $55-$10-$3

= $42

c) Calculate the growth rate

g = Retention Rate × ROE

g = 60% ($5/$55)

= 60% (0.091)

= 0.055

d) Calculate the required rate of return

$r_s = (D_1/ P_0) + g$

= $5/$42 + 0.055

= 0.1191 + 0.055

= 0.1740 OR 17.4%

9.3) A firm's capital structure is composed of 40% debt and 60% equity. The cost of debt is 9%, WACC is 8.56%, and its tax rate is 40%.

a) Calculate the after-tax cost of debt.

*Because interest payment on debt is tax-deductible in the US, we have to find the after-tax cost of debt.

After-tax cost of debt is: 9% (1-tax rate)

0.09(1-0.4)

0.09(0.6) = 0.054 OR 5.4%

b) Calculate the cost of capital for the firm.

WACC = wd*rd + we*re

8.56% = 0.4(0.054) + 0.6(re)

0.0856 = 0.0216 + 0.6re

0.0856 – 0.0216 = 0.6re

0.064 = 0.6re

0.064/0.6 = re

0.1067 = re OR 10.67%

9.4) Your company is in the 40% tax bracket. Its after-tax cost of debt is 5.5%. What is the before tax rate?

After-tax rate = rate (1-tax rate)

5.5% = rate (1- 40%)

0.055 = rate (0.60)

0.055/0.60 = rate (dividing both sides by 0.60)

0.0917 = rate i.e. **9.17%.**

Chapter - 10

Capital Budgeting

Capital budgeting is the process used by businesses to determine if a project should be accepted or rejected. Capital budgeting is crucial for large proposals because failure of an investment could lead to the bankruptcy of a firm. There are a few methods used to evaluate projects e.g. net present value, payback period, profitability index, internal rate of return IRR), etc.

Net present value (**NPV**) is a technique used to assess the viability of a project. It considers the expected cash flows from a potential project and discounts back the cash flows to their present value. The discount rate may be derived from the cost of capital required to make the investment. The formula for calculating NPV is: NPV = CF/(1+i)^n

Where CF is the net cash flow

i is the discount rate

n is the number of years

If the NPV is positive, then the project is considered viable and acceptable; otherwise, it is rejected. If there is more than one project, all proposed projects with positive net present values are compared and the one with the highest net present value is accepted. Because NPV is based on estimates, it is prone to human error.

Payback period considers how long it will take to generate enough cash flow from a project to realize the initial investment i.e. the cash outlay. The company's focus is on the number of years it takes to realize the capital outlay. The drawback for the payback method is that it does not consider any cash flows after the payback period.

The internal rate of return (IRR) is similar to the NPV except that the discount rate is the rate that makes the NPV of an investment equal to zero. The NPV is considered superior to the IRR because IRR makes too many assumptions about reinvestment risk. Profitability index (PI) is another tool like the NPV used in capital budgeting to decide if a project is worth

pursuing. It measures the ratio between the net present value and the initial investment. Profitability index will tell if the project under consideration will add value to the company or not. The formula for calculating PI is (NPV + initial value)/initial value. If the PI is greater than 1, the project generates value and is considered viable for investment. If the PI is less than 1, the project does not generate value and should be rejected. If the PI is equal to 1, the project breaks even and may not be accepted. The higher the profitability index, the more attractive the project is. The drawback is that the discount rate has to be estimated.

10.1) Find the profitability index for these 2 projects and make a recommendation to your company as to which one to embark upon. Project A with a 10% discount rate and $1.5M initial outlay has the following cash flows:

Year	**Cash Flow**
Year 1	$150,000
Year 2	$330,000
Year 3	$500,000
Year 4	$220,000
Year 5	$650,000
Year 6	$500,000

Project B with a 12% discount rate and $3M initial outlay has the following cash flows:

Year	**Cash Flow**
Year 1	$120,000
Year 2	$600,000
Year 3	$1,500,000
Year 4	$1,700,000
Year 5	$180,000
Year 6	$700,000

Project A

Year 1 $150,000/(1.10) = $136363.64

Year 2 $330,000/(1.10)^2 = $272,727.27

Year 3 $500,000/(1.10)^3 = $375,657.40

Year 4 $220,000/(1.10)^4 = $150262.96

Year 5 $650,000/(1.10)^5 = $403,598.86

Year 6 $500,000/(1.10)^6 = $282,236.97

Total = $1620847.10

PI = CF/Initial cash outlay

= $1620847.10/$15000000

= 1.081

Project B

Year 1 $120,000/(1.12) = $107,142.86

Year 2 $600,000/(1.12)^2 = $478,316.33

Year 3 $1,500,000/(1.12)^3 = $1,067,670.37

Year 4 $1,700,000/(1.12)^4 = $1,080,380.73

Year 5 $180,000/(1.12)^5 = $102,136.83

Year 6 $700,000/(1.12)^6 = $354,641.78

Total =3190288.90

PI = 3190288.90/$3000000

= 1.0634

Both projects will add to the company but project A is better with a higher PI.

10.2) Your company uses the payback technique for its capital budgeting. It has a maximum acceptable period of 3 years. You are considering two alternative investments, A and B with the following cash flows.

	Investment A	**Investment B**
Year 1	$10000	$20000
Year 1	$11000	$25000
Year 3	$13000	$15000
Year 4	$16000	
Year 5	$30000	

The capital outlay for each investment is $50,000.

a) Compute the payback period for each of these investments. b) Which investment should you accept?

   If the cash flows were the same every year, you will divide the cash outlay by the cash flow but because it is a mixed stream cash flow, we have to add the cash flows until we hit the $50,000.

   For investment A, we recovered the $50,000 back in 4 years; and for B we recovered the initial cash outlay back in less than 3 years.

b) Investment A takes 4 years to recover the $50,000 and B less than 3 years. Because the company's acceptable payback period is 3 years, investment A is not acceptable but B is.

10.3) What is the payback period for a project with an initial cash outlay of $40000 and a yearly cash flow of $9000?

PB = Initial outlay/CF

= $40000/$9000

= **4.44 years**

Chapter - 11

Risk & Capital Budgeting

Risk is inevitable to investments. Various risks include expected cash flows not coming through on time, the risk of the investing company collapsing and also the management sinking the invested funds in risky projects. Identifying and preparing for potential risk is crucial in capital budgeting. Risk analysis provides important information that can be incorporated into decision-making. Other risks are: project-specific risk, corporate risk, international risk (such as currency exchange risk), and industry-specific risk

By incorporating risk into capital budgeting, firms/investors can minimize losses. If an investment is very risky, investors will require higher return to compensate them for the higher risk. The extra return is the risk premium i.e. the rate above the risk-free rate. To avoid uncertainty, one can multiply estimated cash flows by a factor called certainty-equivalent coefficient. Another method used to reduce uncertainty of future cash flows is sensitivity analysis. Sensitivity analysis is the process used to identify the factors such as sales, tax rate, and cost of sales that influence a project's cash flows, It is used to analyze how a change in each of these factors may affect a project's cash flows. If a project's cash flows are sensitive to changes in any of these factors, the project is considered risky and hence should be avoided.

Probability Distribution

The probabilities of occurrence are called probability distribution. For instance, one can say the probability of it snowing today is 40% and 60% of no snow.

Variance

Variance measures variability. It is the square root of standard deviation.

Standard Deviation

Standard Deviation is the most commonly used measure of dispersion over time. It is a reliable measure of variability. It measures the deviation of each observation from the arithmetic mean of the observations. It is the total

risk of an asset or a portfolio. It is the square root of the sum of $P(r_1 - r)^2$.

Where p is the probability, r_1 is the rate of return, r is the expected rate of return.

Co-efficient of variation

Is a measure of dispersion of a probability distribution? It is the ratio of the standard deviation to the mean of distribution. It is usually expressed as a percentage.

Expected rate of return is the sum of probability of returns.

11.1) Harvey Construction Co. has the following cash flow and probability.

Cash flow	**Probability**
$20,000	0.40
$40,000	0.50
$60,000	0.30

Calculate the coefficient of variation i.e. V.

V = Standard deviation /Expected D

Expected D i.e. (ED) = Sum of DP

Where D is the cash flow

P is the probability

To find the sum of DP

D	**P**	**DP**
$20,000	0.40	$8000
$40,000	0.50	$20000
$60,000	0.30	$18000

Expected **D** = Sum of DP = 0.40($20K)+0.50($40K)+0.30($60K)

= $46000 i.e. $8000+$20000+$18000 i.e. **ED**

Standard deviation i.e. **SD** = sq rt of sum of $(D - ED)^2P$

D	**D – ED**	**$(D-ED)^2$**	**P**	**$(D-ED)^2P$**
$20,000	-$26000	$676M	0.40	$270.4M
$40,000	-$6000	$36M	0.50	$18M
$60,000	$14000	$3600M	0.30	$1080M Sum of $(D-ED)^2P$ = $1368.4M

SD = sq of $1368.4M = $36.99M

V= SD/ED i.e.$36.99M/$46000

$**80413.04**

Chapter - 12

Risk and Return

Return, is a reward or compensation given to investors on their investment for the risk they have to bear. Risk in investment is uncertainty about the happening of a return.

Risk is the probability of not earning a return. It is unavoidable in investment. An investor must compare the expected return from an investment to the risk associated with it. High levels of return will be required for an investment with a high level of risk.

The higher the risk, the higher the return required; the lower the risk, the lower the return required.

There are two components of return: yield and capital gain. Yield is the basic component of return. It is either interest or dividends. Capital gain is the appreciation in the price of an asset. It is the difference between the purchase price and the price at which the assets is sold. Total return = capital gain + yield. Holding period return is: ending value - beginning value + interest income/beginning value. All returns are nominal unless if adjusted for inflation. Consumer price index is used to measure the rate of inflation. An investor should not purchase an asset unless if the expected return is sufficient to compensate risk.

12.1) Given the data below, calculate the beta for each of the 2 portfolios.

Portfolio weights			
Asset	**Asset beta**	**Portfolio A**	**Portfolio B**
1	1.30	10%	20%
2	0.70	30	10
3	1.25	20	25
4	1.10	20	25
5	0.90	20	20
Totals		100%	100%

Portfolio A				Portfolio B			
Asset	**Asset beta**	**Weight**	**(w_1 x β_1)**	**Asset**	**Asset beta**	**Weight**	**(w_1 x β_1)**
1	1.30	10%	0.13	1	1.30	20%	0.26
2	0.70	30%	0.21	2	0.70	10%	0.07
3	1.25	20%	0.25	3	1.25	25%	0.3125
4	1.10	20%	0.22	4	1.10	25%	0.275
5	0.90	20%	0..18	5	0.90	20%	0.18
			0.99				1.0975

Which portfolio is more risky?

Market beta is usually 1.0; and when an asset's beta is higher than the market beta, the asset is considered risky. Therefore; portfolio b is risky.

Chapter - 13

Long-term Debt & Lease Financing

Long-term debt (LTD) is a debt with a maturity of more than 12months. Maturity can range from 13months to 30years. Long-term debt is classified as a non-current liability on a company's balance sheet. Some long-term debts are: bank loans, debentures (loans not backed by specific assets), and bonds. When LTD or a portion of it becomes due within 12 months, that value will move to the current liabilities section of a company's balance sheet. Companies usually take on debts (increase financial leverage) because it does not lead to dilution of ownership unlike to equity financing. Also, interest payments on debt are tax deductible. Companies take on debts to obtain funds for business operation, buy equipment, pay for research, insurance, licenses, supplies, and advertising. Too much debt is not good as it could mean that a company is funding too much of its business with debt and therefore, is at risk of cash flow or insolvency problems.

Lease financing is an essential source of medium and long-term financing where the owner of an asset (the lessor) gives another party (the lessee), the right to use his or her asset for periodic payments (lease rentals) At the end of the lease term, the lessee returns the asset to the lessor unless if there is a clause in the lease agreement that lessee can purchase the asset at the end of the lease. Lease financing can be classified into five capital lease, operating, sale and lease back, synthetic, and combination lease but the two most common types are capital lease and operating lease.

A capital lease is like a purchase of an asset as the lessee assumes ownership at the end of the lease agreement. The lessee must agree to certain criteria such as the value of the lease must be greater than 90% of the asset's market value. Some advantages of capital lease are: the tax deductibility of the rent expense is a big break for the lessee. The lessee does not have to worry about repairing the asset. Cost of purchase is not the responsibility of the lessee. The owner transfers the risk and reward to the lessee. Operating lease (also known as service lease) allows lessee to use an asset but does not transfer ownership of asset to lessee. An example will be a lease on equipment. Rent payment is off the balance sheet but shows as a rental

expense on the income statement. Lease payments are deductible expense for the lessee. The asset owner (lessor) can book periodic depreciation to the depreciation expense account. Most leases are operating leases. If the lessee uses the asset carelessly, the lessor is at a disadvantage.

With the sale and lease back the lessor sells the asset, makes an agreement with new owner to lease the asset, and becomes the lessee. Combination lease is a lease combining the characteristics of other leases; typically operating and capital leases.

13.1) Azizat Inc. has a bond that is selling at par, which pays $100 interest a year.

a) Calculate the coupon rate, the current yield, and the yield to maturity.

b) Calculate the current yield if the bond is selling for $900.

a) Coupon rate = annual interest /current price

= $100/$1000

= 1/10 i.e. **.10 OR 10%**

Current yield = $100/$1000

Yield to maturity i.e. YTM = annual interest /current price

= $100/$1000

= **.10 OR 10%**

YTM = coupon rate because the bond is selling at par.

b) Current yield = annual interest /current price

= $100/$900

= 1/9

= **0.1111 OR 11.11%**

13.2) Your company plans to invest in a company with the following information.

a) 2,500,000 shares of common stock outstanding at $1 par

b) Current market value of common stock is $25 per share

c) Annual dividend per share is $1.65

d) $1,750,000 bonds, 6.25% coupon, with a current market value of $110 (price of $110 for every $100 bond)

e) $2,150,000 bonds, 5.75% coupon, with a current market value of $95 (price of $95 for every $100 bond)

f) The corporate tax rate is 35%

g) 1,000,000 share of preferred stock outstanding, par $10 with a stated preferred dividend rate of 5% and a current market value of the stock is $15.50 per share.

Calculate the current market yield, for an outside investor, for the:

1. Common stock
2. 6.25% bond
3. 5.75% bond
4. Preferred bond.

Common stock yield = 1.65/25

= **0.066 OR 6.6%**

The 6.25% bond yield = $6.25/$110

= **0.0568 OR 5.68%**

The 5.75% bond yield = $5.75/$95

= **0.0605 OR 6.05%**

Preferred stock yield = (0.05($10))/15.50

=$0.50/$15.50

= 0.0322 OR 3.22%

****13.3)** What is the price of a 10 year bond that pays $100 annual interest if an alternative investment has a market interest rate of 12%?

P = Coupon pymt/(1+i) + …….. coupon pymt/$(1+i)^n$ + par value/$(1+i)^n$

= $100/(1+.12) + $100/$(1.12)^2$ + $100/$(1.12)^3$ + …… $100/$(1.12)^{10}$ + $1000/$(1.12)^{10}$

= $100/1.12 + $100/1.25 + $100/1.41 +$100/1.57 + $100/1.76 + $100/1.97 + $100/2.21

+ $100/2.48 + $100/2.77 + $100/3.11 +$1000/3.11

= $89.29 + $80 + $70.92 + $63.69 + $56.82 + $50.76 + $45.25 + $40.32 + $36.1 +

$32.15 + $321.54

= **$886.84**

Chapter - 14

Dividend Policy and Retained Earnings

Dividend is the share of profits that is distributed by a company to its shareholders as the return on their investment. Dividend may be in the form of cash or bonus shares. In the stock market, dividends are regarded as a major contributor to total returns. A company's dividend policy is its decision on the amount of dividends that will be paid out by the company to its shareholders and the frequency with which the dividends are paid out. The dividend policy adopted by a company can affect the value of its business. Therefore, a company must ascertain that the type of dividend policy adopted aligns with its goals and designed to maximize shareholders' value. A company must consider its growth prospects and future projects when deciding on its dividend payout ratio. Some investors believe that a company's dividend payment policy is a reflection of its financial performance. Some of the dividend policies a company can adopt are listed below.

No dividend policy

A company may decide not to distribute dividend and instead keep all profit as retained earnings to use it for growth. Growth and expansion increases the value of a company and its stock. Stock price appreciation is preferable to investors than dividend payment.

Regular Dividend Policy

Under this dividend policy, a company pays out dividend to its shareholders every year. Companies with a steady cash flow and stable earnings usually adopt a regular dividend policy. These companies are considered low-risk investments; however, the dividends are usually low. Consistency of a dividend distribution can be a powerful magnet/driver that pulls investors to buying a stock whether the company increases profits each year or not.

Stable Dividend Policy

With this type of policy, a company pays out a fixed percentage of its profits as dividends to its shareholders. For instance, if a company makes

$50,000 profit it may decide to distribute 10% of it as dividend to its shareholders. Investors consider a company that adopts such a policy as risky because the amount of dividends fluctuates with the level of profits and shareholders are uncertain of the amount of dividend they will receive.

Irregular dividend policy

A company may decide to distribute dividend some of the time or not to pay any at all some of the time and keep all profit as retained earnings to use for project and save on cost of capital. Companies with unsteady cash flows adopt this type of dividend policy. Investors consider companies that adopt this type of policy as very risky.

Dividend Policy Theories

The dividend policy theories are: bird-in-hand theory, dividend irrelevant theory, and tax preference theory.

Bird-in-hand theory

The bird-in-hand theory states that investors' behavior is affected by dividend payout rate rather than capital gains. This theory claims that dividend affect a firm's stock's price and investors' behavior. This is based on the old saying that a bird in the hand is better than a bird in the bush. It simply means that dividend received today is better than the capital gain to be received in the future because the future capital gain is uncertain. This type of investors will invest in companies that pay dividend.

Dividend Irrelevant Theory

This theory states that investors receiving dividends or capital gain do not influence the value of a firm. It is the investment pattern and the earnings of the firm that affect the share price or the value of a firm. Some investors believe that dividend policy is irrelevant and does not determine the market value of stock; therefore, they are indifferent between receiving dividends and capital gains. The theory states that investors do not need to concern themselves with a company's dividend policy because they can sell a portion of their portfolio if they need cash.

Tax Preference Theory

This theory states that some investors prefer a low payout but high capital gain (stock appreciation), hence growth. Some investors prefer long-term capital gains to current dividend and will pay more for the stock of a firm that re-invests its earnings into capital-appreciating projects instead of paying these earnings out as dividends. Capital gain from stock price

appreciation is taxed more favorably than dividend income.

Which of these theories is correct? In the real-world, there is a relationship between a firm's stock price and its dividend policy. We cannot assume that investors are indifferent between dividend yield and capital gain yield. And we cannot ignore the tax effects on investment returns. Financial markets are not perfect. It is difficult to determine with certainty which policy will maximize a firm's stock price. This is because stock price is a function of many variables other than dividend payout.

Signaling Theory

Another theory regarding dividend policy is the dividend signaling theory. Dividend signaling theory suggests that a company's announcement of an increase in dividend payouts is an indication of positive future prospects. Increases in a company's dividend payout reflect a positive future performance of its stock. On the other hand, decreases in a company's payout reflect a negative future performance of its stock. Generally, stock prices tend to rise when a company announces an increase in dividend payouts and fall when dividends are to be decreased.

The drawback is that a negative event may still occur before or after the earnings announcement. A living example is Coca-cola. Despite the consistent increase in its dividends for the past 50years plus, its revenue declined to $8B in 2019 from $10B in 2016. Although the theory has been widely contested, it is still a concept used today by some investors.

Retained Earnings

Retained earnings are the profits that a company earned minus dividends or other distributions paid to investors. A large retained earnings balance indicates that a company is financially healthy. If a company experienced more losses than gains, or distributed more dividends than what it had in its retained earnings balance, the company will have a negative balance in the retained earnings account. That negative balance is called an accumulated deficit. Retained earnings balance (native/positive) is reported in the stockholders' equity section of a company's balance sheet. Some companies use their retained earnings to fund additional growth rather than pay out dividend to shareholders. A company that routinely pays out dividends or the one that has a high payout ratio will have smaller retained earning than the one that does not pay dividend or pays low dividend. A company in a cyclical industry may decide to reserve large retained earnings during profitable cycles to make up for the slow cycle.

RE = BPRe + Net Income – CD – SD

BPRe is beginning period retained earnings

CD = cash dividend

SD = stock dividend

14.1) Progress Energy's stock is $20 a share. Its payout ratio is 30%, and its dividend yield is 10%. a) What is the EPS? b) What is Progress Energy's P/E ratio?

EPS = D/Payout ratio

D = 10 % ($20)

= $2.00

EPS = $2.00/0.30

= $6.67

b) P/E = P/EPS

= $20/$6.67

= **2.99850 OR 3**

14.2) Using the same information above, Progress Energy's after-tax profit is $10M; a) How much will its retained earning be? b) With a residual policy of $5M how much will its retained earning be?

a) Retention rate = 1- payout ratio i.e. 1- 30%

Retained Earnings = (1-0.30)$10M

= (0.7)$10M

= $7M

b) Under residual dividend policy, a company will invest in opportunities before paying common stockholders their dividends.

Retained earnings = $10M-$5M

= $5M

Chapter - 15

Convertible, Warrants & Derivatives

A convertible debt/loan is a debt/loan that can be converted into equity at a later date. The way and manner in which the debt is converted is specified at the time the loan. Investors who are interested in investing in a company may prefer to buy the company's convertible bond as they believe that the compensation, in the form of a warrant or a discount is valuable.

Warrants are another form of an option. It is often expressed in terms of "warrant coverage percentage" i.e. as a percentage of the debt/bond. For instance a "20% warrant coverage" means that the investor can convert 20% of the bond s/he is holding. Convertible notes typically have some cap on the valuation at which they can convert.

A derivative is a financial contract where a buyer agrees to purchase an asset on a specific date at a specific price and is usually linked to a security. A derivative on its own is worthless and its value depends on the value of the primary security that it is linked to. Future/forward contracts, options, swaps, and warrants are derivatives.

Derivatives are often used for commodities, such as oil, gasoline, gold or currencies 9usually the U.S. dollar), to lower risk such as change in price of commodity, exchange rate, and interest rate. The person selling the contract may not have the asset; s/he will have to give the buyer the money to buy the asset or give another derivative contract to offset the value of the first derivative. Derivatives make future cash flows more predictable and allow companies to forecast their earnings more accurately. This predictability boosts stock prices. Businesses then need less cash on hand to cover expenses. Most derivative trading is done by hedging funds. Derivatives require a small amount of down payment called paying on margin.

When derivatives are traded between two companies that know each other, they are called over the counter (OTC); derivatives are traded through intermediaries such as a large bank. Only a small percentage of derivatives are traded on the exchange. When derivatives are traded on the exchange, they are less risky because the exchange sets the

premium/discount on the contract, which makes derivatives feasible for hedging. The two major types of derivatives are: swaps and asset-backed commercial paper. The most common is swaps, which is an agreement to exchange assets or debt for another in order to reduce the risk for both parties of the exchange. There is currency and interest rate swap. Swaps are not traded on an exchange; so it is over-the-counter (OTC)

15.1) You have a convertible bond with a price of $950 with Progress Energy. Its common stock is selling for $45 and the conversion price is $50. a) how many stocks will you receive for your bond if you decided to convert? b) what is the conversion value? c) If the stock price rises to $50 a share, what will the price of the bond be?

a) Conversion ratio = face value/conversion price

= $1000/$50

= **20 shares**

b) Conversion value = $45*20

= **$900**

c) Bond price = current price*conversion ratio

= $50*20

= $1000

15.2) As a PNC Inc. stockholder, you have warrants that entitle you to purchase one stock of common stock for $15 exercise price, the stock is currently selling for $25, and the warrant is quoted at $20. a) what is the intrinsic value of the warrant?

a) Intrinsic value = $25 - $15

= **$10**

Chapter - 16

Valuation & Rate of return

Valuation is the process of determining how much an investment/asset/company is worth. To value a company, one has to look at its capital structure, the probability of future earnings, the market value of its assets, etc. the value of securities are determined by what a buyer is willing to pay and what the seller is willing to accept provided they both enter into the transaction willingly.

There are two main categories of valuation models a) absolute valuation models and b) relative valuation models. Absolute valuation models are used to determine the true value of an investment. Two of these models are the dividend discount model (DDM) and the discounted cash flow model (DCF) Relative valuation models enable one to compare a company or asset to similar company/asset. This valuation involves calculating ratios. One example of these models is the P/E ratio, Relative valuation model is easier and quicker to calculate than the absolute valuation model. Because each stock/company is different, no one method is best suited for every situation.

Rate of return (ROR) is the net gain/loss on an investment expressed as a percentage of the initial value of that investment. Return is interest income received plus any capital gain. It is (current value-initial value)/initial value. The simple rate of return is return on investment (ROI) while the real rate is the discounted cash flow as this return has been adjusted for inflation. Rate of return is determined by studying the historical trend of the same kind of asset/investment and risk. If and when ROR does not consider the effect of inflation, it is called nominal rate of return. If the ROR considers inflation, then it is called the real rate of return.

16.1) PNC Corporation pays $2.50 a year on its preferred stock. Dividend is expected to grow at the rate of 5%; and the market required rate of return is 12% how much will you be willing to pay for the stock?

$P = D/(k-g)$

$= \$2.5/(12\%-5\%)$

$= \$2.50/(0.12-0.05)$

= $2.5/0.07

= **$35.71**

Ch 16.1 Stock Valuation

Stock valuation is a method used to determine the intrinsic value of an investment. Intrinsic value of an investment is the present value of all expected future cash flows, discounted at the appropriate discount rate. If this price is below the market price, the stock is said to be overvalued (i.e. the stock is trading above its fair price); and if above market price, the stock is said to be undervalued ((i.e. the stock is trading below its fair price) Investors rush to buy stocks that are deemed to be undervalued, while stocks that are deemed *overvalued* are sold.

Some of the techniques used to value stocks are: discounted cash flow (DCF), dividend discount model (DDM), and technical analysis, With DCF, expected future cash flows from the stock are discounted back to their present value using appropriate rate. With DDM, expected future dividends are discounted back to their present value.

Another approach is, technical analysis, based on the forces between supply and demand. The higher the number of people demanding the stock, the higher the price of the stock.

Important elements in stock valuation are: growth rate (g), P/E ratio, and earnings per share (EPS)

Some of the formulas used to value assets (stock, bond, company) are: a) P= E/R (1-T) where E is earnings per share, R is the nominal interest rate, and T is tax rate.

b) P= (E +g)/k) + D/k where k is the discount rate, D is dividend, g is the growth rate, and E is earnings per share. c) P = D/k, d) P = D/(k-g) However; the formula one will use depends on the problem one is asked to solve.

16.1) 1. A small business currently generates $30,000 of after-tax cash flow (D_0 = $30,000) the required rate of return (rd) is 15%.

a) What is the firm's value if cash flows are expected to grow at an annual rate of 0% from now to infinity?

V = CF/(r – g) OR D_0 /(r-g) i. e. using constant growth model

= $30000/(15%-0%)

= $30000/0.15

= **$200,000**

b) If CF is $42500, required return is 18%, what is the firm's value if cash flows are expected to grow at an annual rate of 12% for the first 2 years, and then 7% constant from year 3 to infinity?

t	D_0	g	$1 + g^t$	D_t	$(1/1.18)^t$	PV
1	42500	12%	(1.12)^1	$47,600 i.e. 42500(1.12)	0.847457627	$40,338.98
2	42500	12%	(1.12)^2	$53,312 i.e. $42500(1.12)^2$	0.71818443	$38,287.85
					$(1/1.18)^2$	$78,626.83

P3 = D4/(r-g)

$53,312(1.07)/(0.18-0.07) = $518580.36

PV = 518580.36(1.18)^2$ = **$451063.17**

Stock Valuation

16.1) 2. A common stock $25 per share paid $1.5 dividend last year is expected to grow 5% a year in the future.

a) calculate the required rate of return.

r = D/P + g

= 1.5/25 + 0.05

= 0.06 + 0.05

= 0.11

Stock Valuations

16.1) 3. You plan to purchase $100,000 in common stock, which pays no dividends but will appreciate in value 10% per year. There is also an opportunity to invest $100,000 in a lease obligation that will provide the annual year-end cash flows listed below.

Year	Annual Cash Flow from Lease
1	$0
2	$15,000
3	$25,000
	$100,000

Calculate the present value of each of the two investments assuming a 10% discount rate. Which investment provides the higher return over the three-year period?

For the stock

Year	Cash Flow	PV @ 10%	PV
1	$0	0.909	0
2	$0	0.826	0
3	$100K $(1.10)^3$	0.751	$99958.1

$100K (1.331) = $133100 $99958.1 i.e. $133100(0.751)

Total = **$133100**

For the lease

Year	Cash Flow	PV @ 10%	PV
1	$0	0.909	0
2	$15000	0.826	$12390
3	$125000	0.751	$93875

Total **$140000** $106265

The lease investment provided more return.

Ch 16.2 Bond Valuation

16.2) 1. A 15 year 12% coupon bond with a par value of $1000 and the required rate of return is 14%. The r is expected to remain 14% throughout its maturity.

Calculate the value of the bond.

P = $CF/(1+i)^1 + CF/(1+i)^2 + CF/(1+i)^3$ ……+ Face value$/(1+i)^{15}$

= $877.16

Or you can use Excel with this formula PV(14%,120,1000,15,0)

16.2) 2. Bond Valuation

An 8 year 9% coupon bond with a par value of $1000 was sold at a discount for $820.

Calculate the yield to maturity (YTM)

YTM = [CF + ((F-P)/n)] / [(F+P)/2]

= [$1,000*9% + (($1,000 - $820)/8)] / [$1,000 + $820)/2]

= 12.36%

Or you can use Excel with this formula Rate (90,8*1,1000,820,0)

16.2) 3. Bond Valuation

A 15 year 12% coupon bond with a par value of $1000 and the required rate of return is 14%. The r is expected to remain 14% throughout its maturity.

Calculate the value of the bond.

$P = CF/(1+i)^1 + CF/(1+i)^2 + CF/(1+i)^3$ ……+ Face value$/(1+i)^{15}$

= **$877.16**

Or you can use Excel with this formula PV (14%,120,1000,15,0)

Ch 16.3 Security Valuation

16.3) **1**. XYZ's free cash flow (FCF) is $2M a year and is expected to grow at 5%. Its beta is 1.4, tax rate is 40% and has $10.82M in debt, which is 35% of its capital structure. Its before-tax cost of debt is 6%, cost of equity is 13.4%. What is XYZ's value of operation?

$Vop = FCF_0 (1+g) / WACC-g$

WACC = Wd * rd (1-tax) + ws * rs

= 35% [0.06(1-0.4) + 65% (13.4%)

= 35% (0.036) + 0.0871

= 0.0126 + 0.0871

= **0.0997 OR 9.97%**

Vop = $2M (1.05)/(0.0997 - 0.05)

= $2100000/0.0497

= **$42253521.13**

16.3) 2 Security Valuation

MCC currently retains 90% of its earnings ($5 per share this year) It earns an ROE of about 30%. A) With a required rate of return of 14%, how much would you pay for MCC's stock on the basis of the earnings multiplier model?

Required rate of return (k)	14%
Return on equity (ROE)	30%
Retention rate (RR)	90%
Earnings per share (EPS)	$5.00

Growth rate = RR*ROE i.e. 0.9(0.3) = 0.27 OR 27%

Because retention rate is 90%, dividend will be 10%

P/E= D/(k-g) i.e. 0.1/(0.14-0.27) D is 0.1 because RR is 90% OR 0.9

= 0.1/-0.13

= -0.769230769

Because the P/E is a negative value, if we calculate the price, we shall arrive at a negative price for the stock, which is not possible in the real world. No stock will have a negative price.

b. What would you pay for MCC's stock if its retention rate was 60% and its ROE was 19 percent?

Required rate of return (k) 14%

Return on equity (ROE) 19%

Retention rate (RR) 60%

Earnings per share (EPS) $5.00

Growth rate RR*ROE i.e. 0.6(0.19) = 11.40%

P/E= D/(k-g) i.e. 0.4/(0.14-0.1140)

= 0.4/(0.026)

= 15.38461538

Next years earnings $5.57 i.e.$5(1+g) = $5(1+0.1140)

Maximum price is: P/E*Next year's earnings i.e. 15.38461538 ($5.57) = **$85.69**

Chapter - 17

Bond Fundamentals

Bonds are usually issued by companies or governments and are considered the debts of the issuers. Bonds are more of a conservative investment than stocks, and are senior to stocks if the issuer declares bankrupt. Bonds pay regular interest income (coupon rate) to investors usually annually or semiannually, and the principal loaned is paid back when the bond matures. The coupon rate is always tied to the bond's face or par value, and is quoted as a percentage of par. The par is usually $1000. Bond has an inverse relationship with interest rate i.e. when interest rate is high; bond price is low and vice-versa. The bond market is very liquid and active. Bonds play an important part in anybody's portfolio. It is a good practice to have a diversified portfolio of stocks and bonds.

A bond may be a short-term bond, medium or long-term bond. Short-term bonds usually mature in 1-3 years, intermediate-term bonds are generally those that mature in 4 to 10 years, and long-term bonds are those with maturities greater than 10 years.

Bonds may be callable; which means that the issuer may retire them before maturity.

Call provisions are outlined in the bond's prospectus. An investor may receive a call provision the first 3 years after the bond is issued. It is always good for one to check if the bond has a call provision, and then consider how that may impact one's investment strategy. If interest is compounded, it means that interest will earn interest for the investor.

17) 1. You are in the 28% tax bracket and considering purchasing either of these two bonds. One is a corporate bond carrying an 8% coupon and selling at par. The other is a municipal bond with a 5% coupon, and selling at par. Assuming all other factors are equal, which bond should you select?

Using the ETY i.e. equivalent taxable yield formula, the municipal bond's after=tax return is:

ETY = i/(1-tax rate)

= 5% /(1-28%)

= 0.05/(0.72)

= **0.0694**

The corporate bond with 8% provides a higher return.

Chapter - 18

Organization functions, Security & Market Indexes

Organization functions are core processes or set of activities that are carried out within departments of a company. Some of these functions are revenue-generating activities such as marketing, sales, and customer service. Others are: HR, finance, IT and warehousing. All functions are crucial to the success of an organization although some functions are highly recognized and some are less recognized. For any organization to operate efficiently and effectively, it needs to have a planned structure that fits the style, size and operations of its business.

A security market index is a given security market or asset class constructed as portfolios of marketable securities. Initially, security market index was used to measure the US stock market performance. It later evolved into an important multi-purpose tool used to help investors in tracking stock performance and risk. Security indexes can also help investors to benchmark active managers and invest in broad markets at low costs. Investors can also use indexes to compare stocks and bonds, value stock and growth stock, or large cap and small or mid cap. Indexes are used to measure the values of different target markets. Some indexes represent the global market for major asset classes while some represent investments in specific geographic markets. For investors to benefit from the use of indexes, they need to understand market indexes construction and determine if the index they selected for use is appropriate for their purposes.

18.1) Laura has a margin account, which requires a 40% deposit. She deposited $50000. The stock is selling for $35 per share.

a) Ignoring commission, how many shares can Laura buy?

$50000 = 40% of X

$50000 = 0.40X

$50000/0.4 = X

$125000 = X

# of shares is: $125000/$35

= **3571.4 shares**

b) What is Laura's profit if the stock is: i) $45? ii) $25

i) $45(3571.4) = $160713

$160713 - $125000 = **$35713 gain**

ii) $25(3571.4) = $89285

$125000 - $89285 = **$35715 loss**

18.2) ABC's stock is selling for $35 a share. You put in a limit buy order at $30 for one month. During the month the stock price declines to $25, then jumps to $40. Ignoring commissions, what would have been your rate of return on this investment? What would be your rate of return if you had put in a market order? What if your limit order was at $16?

i) Selling price $40, limit order price $30

Return is ($40 - $30)/$30 =33.3%

ii) Selling price $40, market order price $35

Return is ($40 - $35)/$35 =14.29%

iii) A limit order for $16 would not be executed because price never declined to $16. The lowest price was $25.

18.3) You have 1200 shares of Twitter which you decided to sell in December and buy back in February. Broker's fee is $4.95 and an additional $25.00 service charge, so the total commission is $29.95. The total transaction costs for selling the 1,200 shares of Twitter in December were $59.95. a) What was the bid/ask spread? b) In February, your total transaction costs for buying the 1,200 shares of Twitter were $47.95. What was the bid/ask spread for Twitter at the time your trade was executed? c) What are your total round-trip transaction costs for both selling and buying the shares?

a) bid/ask spread = Total transaction cost-commission

= $59.95-$29.95

= $30

b) bid/ask spread = Total transaction cost-commission

= $$47.95-$29.95

= $18

c) Total transaction cost for buying and selling = $59.95 + $47.95

= $107.90

Chapter - 19

Security & Market Indexes

19.1) Given the data below,

		Price	
Stock	**Number of Shares**	**T**	**T+1**
A	1,000,000	$60	$80
B	10,000,000	$20	$35
C	30,000,000	$18	$25

Calculate the price-weighted index for these three stocks, and compute the percentage change in the index for the period from T to T + 1.

		Time t	**Time t+1**
a)	A	$60.00	$80.00
	B	$20.00	$35.00
	C	$18.00	$25.00
	Total	$98.00	$140.00
	# of stocks	3	3
	Avg $32.67	$46.67	

% Change = ($46.67- $32.67)$/32.67 = 42.86%

b)	**# of shares**	**Price**	**Total Value**
A	1,000,000	$60.00	$60,000,000.00
B	10,000,000	$20.00	$200,000,000.00
C	30,000,000	$18.00	$540,000,000.00
			$800,000,000.00
A	1,000,000	$80.00	$80,000,000.00
B	10,000,000	$35.00	$350,000,000.00
C	30,000,000	$25.00	$750,000,000.00
			$1,180,000,000.00

% Change=$1,180,000,000-$800,000,000.00/$800,000,000.00

= **47.50%**

Chapter - 20

Technical Analysis

In finance, technical analysis is a method used to forecast the direction of prices by studying past market data such as price and volume. It is believed that history repeats itself; so technical analysis focuses on trend. The validity of technical analysis is disputed by the efficient-market hypothesis, which states that stock market prices are unpredictable. Technical analysts look for reversal patterns and study moving averages to predict stock movement. They also use market indicators such as mathematical transformations of price including up and down volume, advance/decline data as inputs. Analysts study correlations between changes in options implied volatility, bull/bear, and put/call ratios with price.

Technical analysts employ models and trading rules based on price and volume transformations, such as the relative strength index, moving averages, regressions, inter-market and intra-market price correlations,

Some traders use technical or fundamental analysis exclusively, while others use both types to make trading decisions. In fundamental analysis, analysts study economic factors that influence how investors price financial assets. Fundamental analysts look at the facts of the company, market, currency or commodity. Technical analysts analyze price, volume, psychology, money flow and other market information. Support of technical analysis is inconclusive because although technical analysis may produce positive results; it is questionable due to issues such as data snooping. However; users hold that even if technical analysis cannot predict the future, it helps to identify trends, tendencies, and trading opportunities. Some studies indicated that technical analysis inability to predict the future may be due to central banks' intervention.

20.1) Assume the following daily closings for the Dow Jones Industrial Average:

Day	DJIA	Day	DJIA
1	13,010	7	13,220
2	13,100	8	13,130
3	13,165	9	13,250
4	13,080	10	13,315
5	13,070	11	13,240
6	13,150	12	13,310

a. Calculate a four-day moving average for Days 4 through 12.

Day 4: ($13010+ $13100 +$13165 + $13080)/4

= $13,088.75

Day 5: ($13100 +$13165 + $13080+ $13070)/4

= $13,103.75

Day 6: ($13165 + $13080+ $13070+ $13150)/4

= $13,116.25

Day 7: ($13080+ $13070+ $13150 + $13220)/4

= $13,130

Day 8: ($13070+ $13150 + $13220 + $$13130)/4

= $13142.5

Day 9: ($13150 + $13220+ $13130 + $$13250)/4

= $13,187.5

Day 10: ($13220 + + $13130 +$13250 + $13315)/4

= $13,228.75

Day 11: ($13130 + $$13250 + $13315 + $13240)/4

= $13,233.75

Day 12: $$13250 + $13315 + $13240+ $13310)/4

= 13,278.75