VIRTUAL UNIVERSITY OF PAKISTAN

Corporate Finance

FIN622

Course Handouts

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LESSON 01

INTRODUCTION TO SUBJECT

Corporate finance is the study of planning, evaluating and drawing decisions in the course of business. Let's take a simple example to determine the scope of our subject. This would cover around 85% to 90% of scheme of studies of corporate finance.
Suppose you intend to kick start a business. Three up-front questions that hit our top of the head are:

- What type of investments do we need? In other words, what type of assets will be required to support the intended business?
- Where the money will come from? Sources of investments to be determined in black and white.
- How we will finance our day to day monetary matters like purchase of raw materials and payment of salaries etc?

To answer these question let's explore them individually for twin purpose: to know what is corporate finance and secondly, to determine the scope of the subject.
Referring to question # 1 – Types of investment or assets needed in the business:
The answer to this question can be found by defining Capital Budgeting process.

Capital Budgeting:
It involves planning, analyzing and acquiring capital assets like Plant and Machinery or Land or Building. These investments take ample amount of resources and therefore, these decisions are irreversible in nature. That in turn means that once the decision is implemented it would incur heavy losses if we want to un-do it subsequently. Therefore, making investment in capital assets is a very risky process and must be handled with care and skill.

SWOT analysis is also very helpful in capital budgeting process.
SWOT stands for:

- Strengths
- Weaknesses
- Opportunities
- Threats

Strengths are connected to Opportunities and in order to tap the lucrative opportunities you need to make capital investment, which must be handled with due care and skill ensuring effective decision making. This means that type of assets to be acquired depends on the nature, need and resources of business besides some other factors. For example, a large airline industry would acquire bigger plane than a smaller airline which may opt for a relatively cheaper plane.
Taking up the second question in line, that is, "where the money will come from?"
Broadly speaking there are two potential sources for making investments. The first sources emerge from the contributions of sponsors or directors who commence the business. This portion of investment is called Capital or Equity contribution.
The other source of investment is from loans and various financial instruments and markets. Banks provide long term and short loans to the business world and this has been the most important source of business finance and is being used widely.
Other source of external financing is issuance of bonds and securities in primary and secondary markets.
This process is known as Capital Structure Decisions in which it is determined that how much of the total cost shall be financed by Equity contribution and Loans.
Moving to third and last question:
To finance day to day financial needs is in fact an issue that fall within the ambit of Working Capital policies. Following are the typical questions in this context:

- What would be our purchases level for raw materials?
- Do we need to import or are locally available?
- How much finances will be needed to procure raw materials?
- What are our customers or markets?
- How many days credit to be extended to customer and taken from creditor?

FINANCIAL STATEMENTS & CORPORATE FINANCE WITH SOME IMPORTANT CONCEPTS:

There are basically three financial statements that every business entity runs periodically. It includes:

- Balance Sheet
- Income Statement
- Cash Flow
-

Balance Sheet:

This is a statement of resources controlled by and obligations to settle by an entity as on a specified date. The format of Financial Statements is governed by International Financial Reporting Standard in Pakistan. However, in US these are governed by the provisions of Generally Accepted Accounting Principles (GAAP).

Balance Sheet Contents are:

i) Fixed Assets
ii) Current Assets
iii) Current Liabilities
iv) Long Term Liabilities
v) Capital & Reserves

Assets (both fixed and current) are placed in balance sheet in the order of less liquid or illiquid to liquid. This means that current assets are more liquid than fixed assets. Then question arises "what is liquidity?" or "what is a liquid asset?"

An asset that can be converted to cash quickly and without loss of value is liquid asset. For example, prize bond is not a currency but you can get the face or par value of a prize bond when you sell the bond to any one. But this is not the case when you want to sell your motorcycle or car. Therefore, car or motor cycle is not a liquid asset but prize bond or gold are highly liquid.

Current Assets and Current Liabilities when clubbed together, give birth to another concept known as working capital.

Current assets are those that form part of the circulating capital of a business. They are replaced frequently or converted into cash during the course of trading. The most common current assets are stocks, trade debtors, and cash.

Current liabilities are those short-term liabilities which are intended to be constantly replaced in the normal course of trading activity. Current liabilities typically comprise: trade creditors, accruals and bank overdrafts.

There is another concept of Cash Cycle associated with working capital. Take a compact example to understand.

You acquire goods or raw materials from vendors on credit. It takes time (say in days) to process or transform raw materials to finished goods, which are sold to customers on credit. Customers or Debtors are allowed a time period (in days) to settle or pay their bills and money received from debtors is used to pay off creditor, who provided goods on credit. Let's assume you allowed your customers 30 days to pay for goods you sold to them on credit. And on the other hand you sought 35 days cushion from creditors to pay off purchases of raw materials. In this simple example you were still able to use money for 5 days before paying to creditors. This means the operating cycle is positive.

Other concepts from financial statements shall be taken up in the next hand out.

LESSON 02

COMPARISON OF FINANCIAL STATEMENTS

Often it becomes very difficult to compare financial statements of two or more business entities due to

i) Size
ii) Functional currency.

However, we can overcome these problems by utilizing two effective tools of comparison. These tools can be used for comparing performance of single entity over period of time and to compare two or more entities.

1) COMMON SIZE STATEMENTS
2) RATIO ANALYSIS

1) COMMON SIZE STATEMENTS

BALANCE SHEET AS AT 30 JUNE 2003				
	2003	**2002**	**2003**	**2002**
	RUPEES	**RUPEES**	**% age**	**%age**
OPERATING ASSETS				
Fixed assets (at cost less accumulated depreciation)	125,138,737	109,101,363	62.87	60.73
DEFERRED COST	12,653,681	18,514,377	6.36	10.31
LONG TERM DEPOSITS (against Lease)	2,930,337	827,737	1.47	0.46
	140,722,755	128,443,477		
CURRENT ASSETS				
Stores & spares	7,347,476	11,215,891	3.69	6.24
Stocks -do-	22,628,137	19,231,731	11.37	10.70
Trade debtors	2,149,858	3,211,998	1.08	1.79
Advances, deposits, prepayments and other receivables	26,089,950	17,450,008	13.11	9.71
Cash and bank balances	107,524	110,421	0.05	0.06
	58,322,945	51,220,049	**100.00**	**100.00**
CURRENT LIABILITIES				
Current maturity portion of lease liability	(6,794,240)	(2,821,322)	3.41	1.57
Current maturity portion of Long Term Loans	(8,004,000)	-	4.02	-
Short term borrowings	(6,760,139)	(19,270,244)	3.40	10.73
Creditors, accruals and other liabilities	(30,831,550)	(44,786,359)	15.49	24.93
	(52,389,929)	(66,877,925)		
NET CURRENT ASSETS	5,933,016	(15,657,876)		
TOTAL ASSETS LESS CURRENT LIABILITIES	146,655,771	112,785,601		

LONG TERM LIABILITIES				
Deferred Income	(1,692,510)	-	0.85	-
Due to directors and relatives	(37,056,700)	(21,693,585)	18.62	12.07
Provident fund trust and gratuity payable	(926,457)	(926,457)	0.47	0.52
Long term loans	(27,828,000)	(47,500,000)	13.98	26.44
Dealers & Distributors securities	(23,871,350)	(19,398,600)	11.99	10.80
Long term portion of leasehold assets	(12,710,887)	(1,936,847)	6.39	1.08
	(104,085,904)	(91,455,489)		
TOTAL NET ASSETS	42,569,867	21,330,112		
REPRESENTED BY :				
Share capital	59,800,000	39,800,000	(30.04)	(22.15)
Profit & (loss) account	(27,457,311)	(29,697,066)	13.79	16.53
Surplus on revaluation of fixed assets	8,227,178	8,227,178	(4.13)	(4.58)
Share deposit money	2,000,000	3,000,000	(1.00)	(1.67)
	42,569,867	21,330,112		
The annexed notes form an integral part of these accounts.				
LAHORE	(199,045,700)	(112,785,601)	**100.00**	**100.00**
DATED				

Take the balance sheet first. Instead of putting rupee values in balance sheet, we place %age against each line item with regard to total asset. The total assets are taken as 100 and every line item relationship with total assets expressed in %age is placed against it. Take a look at the attached Common Size balance sheet.

During 2002 total assets were 60.73% of total assets and that has been increased to 62.87% of total assets in 2003. Every line-item on asset side is expressed as % of total assets. You are now in a position to compare financial statements over a period of time to know what developments have been made over time.

PROFIT AND LOSS ACCOUNT FOR THE PERIOD ENDED 30TH JUNE, 2003.				
	2003	2002	2003	2002
	RUPEES	RUPEES		
SALES	116,811,832	109,030,501	100.00	100.00
COST OF SALES	(60,117,579)	(58,812,941)	(51.47)	(53.94)
GROSS PROFIT	56,694,253	50,217,560	48.53	46.06
OPERATING EXPENSES	(56,105,424)	(53,414,839)		
Administrative	(8,691,429)	(9,173,201)	(7.44)	(8.41)
Selling, distribution and amortization	(37,385,642)	(31,684,350)	(32.01)	(29.06)
Financial charges	(10,028,353)	(12,557,288)	(8.59)	(11.52)
OPERATING PROFIT/(LOSS)	588,828	(3,197,279)		
OTHER INCOME/(LOSS)	2,387,106	360,873	2.04	0.33
PROFIT/(LOSS) BEFORE TAXATION	2,975,934	(2,836,406)		
WORKERS PROFIT PARTICIPATION	(148,797)	-	(0.13)	-
PROFIT/(L0SS) BEFORE TAXATION	2,827,137	(2,836,406)	2.42	(2.43)
PROVISION FOR TAXATION	(587,382)	(545,152)	(0.50)	(0.50)
PROFIT/(L0SS) AFTER TAXATION	2,239,755	(3,381,558)		
PROFIT/(LOSS) BROUGHT FORWARD	(29,697,066)	(26,315,508)		
PROFIT/(LOSS) CARRIED OVER TO BALANCE SHEET	(27,457,311)	(29,697,066)		

In common size income statement every line item is expressed as %age of sales. In other words, cost of sales, operating expenses and net income add up to 100%. Let look at the Common Size Income Statement. Cost of Sales in 2002 was 53.94% of sales, which dropped to 51.47% in 2003. This is a favorable symptom because any reduction in cost will lead to increase in profit. This is confirmed when we look at the gross profit. In 2002 GP was 46.06% of sales and that increased to 48.53% in 2003. The comparison here reveals that company has improved it performance over the year 2002.

Base Year Analysis: Common Size analysis is also known as Vertical Analysis. Base year analysis is another tool of comparing performance and is also known as Horizontal Analysis.

BASE YEAR /HORIZONTAL ANALYSIS
BALANCE SHEET
EXAMPLE HORIZONTAL ANALYSIS

ASSETS	**2006**	**2005**	**2004**	**2003**	**2002**	**BASE YEAR 2001**
FIXED ASSETS	160,000.00	155,000.00	145,000.00	145,000.00	125,000.00	100,000.00
	160.00	**155.00**	**145.00**	**145.00**	**125.00**	**100.00**
CURRENT ASSETS	70,000.00	65,000.00	56,000.00	58,000.00	55,000.00	50,000.00
	140.00	**130.00**	**112.00**	**116.00**	**110.00**	**100.00**
TOTAL ASSETS	**230,000.00**	**220,000.00**	**201,000.00**	**203,000.00**	**180,000.00**	**150,000.00**
	153.33	**146.67**	**134.00**	**135.33**	**120.00**	**100.00**
CAPITAL & LIABILITIES						
CURRENT LAIBILITIES	22,000.00	21,500.00	19,000.00	17,000.00	16,000.00	15,000.00
	146.67	**143.33**	**126.67**	**113.33**	**106.67**	**100.00**
LONG TERM LIABILITIES	15,000.00	13,000.00	12,000.00	11,500.00	10,500.00	10,000.00
	150.00	**130.00**	**120.00**	**115.00**	**105.00**	**100.00**
EQUITY	193,000.00	185,500.00	170,000.00	174,500.00	153,500.00	125,000.00
	154.40	**148.40**	**136.00**	**139.60**	**122.80**	**100.00**
TOTAL CAPITAL & LIABILITIES	**230,000.00**	**220,000.00**	**201,000.00**	**203,000.00**	**180,000.00**	**150,000.00**
	153.33	**146.67**	**134.00**	**135.33**	**120.00**	**100.00**

In this case, performance is compared over, say, five years period. The earliest year or the first year is taken as base year and every line item in the balance sheet of base year is taken as 100%. In the subsequent years amounts of every line item are expressed as %age of base year amount.

You can see the Base Year analysis example from the attached balance sheet. Comparison is being made from the year 2001 to 2006; therefore, the earliest year i.e., 2001 is labeled as base year. Total fixed assets in 2001 were Rs. 100,000/- expressed as 100% (cell H9: in blue font). In year 2005 the total investment in fixed assets has risen to Rs. 155,000/-, which is 155% of base year amount (Rs. 100,000). This means that from 2002 to 2005, 55% investment of base year amount has been injected in fixed assets and that further increased to 60% at the end of year 2006.

2) Ratios Analysis:
This is another widely acknowledged and used comparison tool for financial managers. A ratio is a relationship between two or more line items expressed in %age or number of times. Financial ratios are useful indicators of a firm's performance and financial situation. Most ratios can be calculated from information provided by the financial statements. Financial ratios can be used to analyze trends and to

compare the firm's financials to those of other firms. In some cases, ratio analysis can predict future bankruptcy.
Financial ratios can be classified according to the information they provide.

BALANCE SHEET
AS AT 30 JUNE 2003

	NOTES	2003 RUPEES	2002 RUPEES
OPERATING ASSETS			
Fixed assets (at cost less accumulated depreciation)	3	125,138,737	109,101,363
DEFERRED COST	4	12,653,681	18,514,377
LONG TERM DEPOSITS (against Lease)		2,930,337	827,737
		140,722,755	128,443,477
CURRENT ASSETS			
Stores & spares		7,347,476	11,215,891
Stocks	5	22,628,137	19,231,731
Trade debtors	6	2,149,858	3,211,998
Advances, deposits, prepayments and other receiveables	7	26,089,950	17,450,008
Cash and bank balances	8	107,524	110,421
		58,322,945	51,220,049
CURRENT LIABILITIES			
Current maturity portion of lease liability	9	(6,794,240)	(2,821,322)
Current maturity portion of Long Term Loans		(8,004,000)	-
Short term borrowings	10	(6,760,139)	(19,270,244)
Creditors, accruals and other liabilities	11	(30,831,550)	(44,786,359)
		(52,389,929)	(66,877,925)
NET CURRENT ASSETS		5,933,016	(15,657,876)

	2003	2002
CURRENT RATIO	1.11	0.77
QUICK RATIO	(0.54)	(0.31)
TOTAL DEBT RATIO		
=Total Debt/Total Assets	0.31	0.40
OR		
Total Assets - Equity / **Total Assets**	0.79	0.88
DEBT - EQUITY RATIO		
=Total Debt / Equity	(1.46)	(3.35)
TIMES INTEREST EARNED		
Earning before Tax / **Interest Expense**	0.30	0.23
INVENTORY TURNOVER		

CURRENT LIABILITIES		2003		2002			2003	2002
Current maturity portion of lease liability	9	(6,794,240)		(2,821,322)		TIMES INTEREST EARNED		
Current maturity portion of Long Term Loans		(8,004,000)		-				
Short term borrowings	10	(6,760,139)		(19,270,244)		**Earning before Tax**	0.30	0.23
Creditors, accruals and other liabilities	11	(30,831,550)		(44,786,359)		**Interest Expense**		
		(52,389,929)		(66,877,925)				
NET CURRENT ASSETS		5,933,016		(15,657,876)		INVENTORY TURNOVER		
TOTAL ASSETS LESS CURRENT LIABILITIES		146,655,771		112,785,601		**Cost of Good Sold**	(2.87)	(3.06)
						Avg. Inventory		
LONG TERM LIABILITIES								
Deferred Income		(1,692,510)		-				
Due to directors and relatives		(37,056,700)		(21,693,585)		A/R TURNOVER		
Provident fund trust and gratuity payable	12	(926,457)		(926,457)				
Long term loans	13	(27,828,000)		(47,500,000)		**Sales**	54.33	33.94
Dealers&Distributors securities	14	(23,871,350)		(19,398,600)		**Account Receivable**		
Long term portion of leasehold assets		(12,710,887)		(1,936,847)				
		(104,085,904)		(91,455,489)		Avg Collection Period		
						365	6.72	10.75
TOTAL NET ASSETS		42,569,867	0	21,330,112		**A R Turnover**		
REPRESENTED BY :								
Share capital (5,980,000)	15	59,800,000		39,800,000		PAYABLE TURNOVER		
Profit & (loss) account		(27,457,311)		(29,697,066)				
Surplus on revaluation of fixed assets		8,227,178		8,227,178		**Cost of Good Sold**	(2.42)	(1.61)
Share deposit money		2,000,000		3,000,000		**Trade Creditors**		
		42,569,867		21,330,112				
The annexed notes form an integral part of these accounts.								
						NET PROFIT RATIO		
LAHORE		-						
DATED						**Net Income**	2.420	(2.601)
						Sales		

		2003	2002
			-
11	**CREDITORS, ACCRUED AND OTHER LIABILITIES**		
	Creditors	24,820,277.00	36,565,866.00
	Advances from customers	57,178.00	17,650.00
	Accrued liabilities	2,710,813.00	2,847,749.00
	Accrued interest on secured loans	1,200,010.00	2,844,012.00
	Sales tax payable	1,571,414.00	1,800,396.00
	Income tax payable - employees	12,131.00	15,920.00
	Other liabilities	310,930.00	694,766.00
	WPPF Payable	148,796.71	-
		30,831,549.71	44,786,359.00

	2003	2002
NET PROFIT RATIO		
Net Income / Sales	2.420	(2.601)
RETURN ON ASSETS		
Net Income / Total Assets	2.259	(2.5998)
RETURN ON EQUITY		
Net Income / Equity	6.64	(13.30)
MARKET RATIOS		
Earning Per Share		
Net Income / Total Shares (O/S)	0.47	(0.71)

The following types of ratios frequently are used:

1. Short Term Solvency or Working Capital ratios
2. Long term solvency ratios
3. Asset management turnover ratios
4. Profitability ratios
5. Market value ratios

Short Term Solvency or Working Capital ratios:

These ratios provide information about a firm's ability to meet its short-term financial obligations. They are of particular interest to those extending short-term credit to the firm. Two frequently-used liquidity ratios are the current ratio (or working capital ratio) and the quick ratio.
The current ratio is the ratio of current assets to current liabilities:
Current Ratio = Current Assets/Current Liabilities
Keeping the comparison purpose in our mind, you can see that in the attached balance sheet this ratio improved in 2003 over 2002. Normally, this ratio is expressed as 0.77:1meaning that current assets are 77% of current liabilities in 2002. This was improved at the end of year 2003 when our current assets were more than liabilities. The ratio in 2003 is 1.11:1.
Short-term creditors prefer a high current ratio since it reduces their risk. Shareholders may prefer a lower current ratio so that more of the firm's assets are working to grow the business. Typical values for the current ratio vary by firm and industry. For example, firms in cyclical industries may maintain a higher current ratio in order to remain solvent during downturns. One drawback of the current ratio is that inventory may include many items that are difficult to liquidate quickly and that have uncertain liquidation values. The quick ratio is an alternative measure of liquidity that does not include inventory in the current assets. The quick ratio is defined as follows:
Quick Ratio = (Current Assets – Inventory)/ Current Liabilities
This ratio also shows the investment level in inventories. Excessive investment in inventories is often considered as inefficient use of resources.
The current assets used in the quick ratio are cash, accounts receivable, and notes receivable. These assets essentially are current assets less inventory. The quick ratio often is referred to as the acid test.

Asset Turnover Ratios:
Asset turnover ratios indicate of how efficiently the firm utilizes its assets. They sometimes are referred to as efficiency ratios, asset utilization ratios, or asset management ratios. Two commonly used asset turnover ratios are receivables turnover and inventory turnover.
Receivables turnover is an indication of how quickly the firm collects its accounts receivables and is defined as follows:

Receivables Turnover = Annual Credit Sales / Accounts Receivable

The receivables turnover often is reported in terms of the number of days that credit sales remain in accounts receivable before they are collected. This number is known as the collection period.

The collection period also can be written as:
Average Collection Period = 365 / Receivables Turnover

Another major asset turnover ratio is inventory turnover. It is the cost of goods sold in a time period divided by the average inventory level during that period:
Inventory Turnover = Cost of Goods Sold/Inventory
The variations in formula of inventory turnover relates to the denominator as some financial managers take closing inventory value and other prefer to have average inventory, which we can work out by adding opening and closing inventories and dividing by 2.

The inventory turnover often is reported as the inventory period, which is the number of days worth of inventory on hand, calculated by dividing the inventory by the average daily cost of goods sold:
Inventory Period = Annual Cost of Goods Sold / Average Inventory

Other asset turnover ratios include fixed asset turnover and total asset turnover.

Leverage or Long term solvency Ratios

Financial leverage ratios provide an indication of the long-term solvency of the firm. Unlike liquidity ratios that are concerned with short-term assets and liabilities, financial leverage ratios measure the extent to which the firm is using long term debt.

The debt ratio is defined as total debt divided by total assets:

Debt Ratio = Total Debt/Total Assets

The debt-to-equity ratio is total debt divided by total equity:

Debt-to-Equity Ratio = Total Debt/Total Equity

Debt ratios depend on the classification of long-term leases and on the classification of some items as long-term debt or equity. The times interest earned ratio indicates how well the firm's earnings can cover the interest payments on its debt. This ratio also is known as the interest coverage and is calculated as follows:

Interest Coverage = EBIT/Interest Charges

Where EBIT = Earnings before Interest and Taxes Profitability Ratios Profitability ratios offer several different measures of the success of the firm at generating profits.

The gross profit margin is a measure of the gross profit earned on sales. The gross profit margin considers the firm's cost of goods sold, but does not include other costs. It is defined as follows:

Gross Profit Margin = Sales - Cost of Goods Sold/Sales

Return on assets is a measure of how effectively the firm's assets are being used to generate profits. It is defined as:

Return on Assets = Net Income/Total Assets

Return on equity is the bottom line measure for the shareholders, measuring the profits earned for each dollar invested in the firm's stock. Return on equity is defined as follows:

Return on Equity = Net Income/Equity

Market Ratios:

Earning Per Share:

This explains the portion of net income attributable to one common share. It is calculated as:

EPS = net income / No. of O/S shares

P/E ratio = price per share/EPS

Market to Book Value:

= MV per share/BV per share

Use and Limitations of Financial Ratios

Attention should be given to the following issues when using financial ratios:

A reference point is needed. To be meaningful, most ratios must be compared to historical values of the same firm, the firm's forecasts, or ratios of similar firms.

Most ratios by themselves are not highly meaningful. They should be viewed as indicators, with several of them combined to paint a picture of the firm's situation.

Year-end values may not be representative. Certain account balances that are used to calculate ratios may increase or decrease at the end of the accounting period because of seasonal factors. Such changes may distort the value of the ratio. Average values should be used when they are available. Ratios are subject to the limitations of accounting methods. Different accounting choices may result in significantly different ratio values.

LESSON 03

TIME VALUE OF MONEY

Time Value of Money offers an overview of the information required to calculate the future and present values of individual cash flows, ordinary annuities, due perpetuities and investments with uneven cash flows. TVM is based on the concept that a dollar that you have today is worth more than the promise or expectation that you will receive a dollar in the future. Money that you hold today is worth more because you can invest it and earn interest. After all, you should receive some compensation for foregoing spending. This hand out has been divided into following topics, which will be explained in detail:

1. PRESENT VALUE
2. FUTURE VALUE
3. ANNUITIES
4. PERPETUITY

PRESENT VALUE

The present value of a future cash flow is the nominal amount of money to change hands at some future date, discounted to account for the time value of money. A given amount of money is always more valuable sooner than later because this enables one to take advantage of investment opportunities.
The present value of delayed payoff may be found by multiplying the payoff by a discount factor which is less than 1. If C1 denotes the expected payoff at period 1, then

Present Value (PV) = discount factor. C1

This discount factor is the value today of $1 received in the future. It is usually expressed as the reciprocal of 1 plus a rate of return.

Discount Factor = 1 / 1+r

The rate of return r is the reward that investors demand for accepting delayed payment.
The present value formula may be written as follow:

PV = 1 / 1+r. C1

To calculate present value, we discount expected payoffs by the rate of return offered by equivalent investment alternatives in the capital market. This rate of return is often referred to a the discount rate, hurdle rate or opportunity cost of capital. If the opportunity cost is 5 percent expected payoff is $200,000, the present value is calculated as follows:

PV = 200,000 / 1.05 = $190,476

FUTURE VALUE

Future value measures what money is worth at a specified time in the future assuming a certain interest rate. This is used in time value of money calculations.
To determine future value (FV) without compounding:

$$FV = PV \cdot (1 + rt)$$

Where *PV* is the present value or principal, *t* is the time in years, and *r* stands for the per annum interest rate.
To determine future value when interest is compounded:

$$FV = PV \cdot (1 + i)^n$$

Where *PV* is the present value, *n* is the number of compounding periods, and *i* stands for the interest rate per period.

The relationship between *i* and *r* is:

$$i = r \div X$$

Where *X* is the number of periods in one year. If interest is compounded annually, *X* = 1. If interest is compounded semiannually, *X* = 2. If interest is compounded quarterly, *X* = 4. If interest is compounded monthly, *X* = 12 and so on. This works for everything except compounded continuously, which must be handled using exponential.

For example, what is the future value of 1 money unit in one year, given 10% interest? The number of time periods is 1, the discount rate is 0.10, the present value is 1 unit, and the answer is 1.10 units. Note that this does not mean that the holder of 1.00 unit will automatically have 1.10 units in one year, it means that having 1.00 unit now is the equivalent of having 1.10 units in one year.

ANNUITY

An annuity is an equal, annual series of cash flows. Annuities may be equal annual deposits, equal annual withdrawals, equal annual payments, or equal annual receipts. The key is equal, annual cash flows. Annuities work in the following way.
Illustration:
Assume annual deposits of $100 deposited at end of year earning 5% interest for three years.

Year 1: $100 deposited at end of year	= $100.00
Year 2: $100 × .05 = $5.00 + $100 + $100	= $205.00
Year 3: $205 × .05 = $10.25 + $205 + $100	= $315.25

There are tables for working with annuities. Future Value of Annuity Factors is the table to be used in calculating annuities due. Just look up the appropriate number of periods, locate the appropriate interest, take the factor found and multiply it by the amount of the annuity.

For instance, on the three-year 5% interest annuity of $100 per year. Going down three years, out to 5%, the factor of 3.152 is found. Multiply that by the annuity of $100 yields a future value of $315.20.

The present value of annuity can be finding out by the following formula:

Present value of annuity = C [1/r-1/r(1+r)t]

The expression in brackets is the annuity factor, which is the present value at discount rate r of an annuity of $1 paid at the end of each of t periods.

PEPETUITY

Perpetuity is a cash flow without a fixed time horizon.
For example if someone were promised that they would receive a cash flow of $400 per year until they died, that would be perpetuity. To find the present value of a perpetuity, simply take the annual return in dollars and divide it by the appropriate discount rate.

The present value of perpetuity can be finding out by the following formula:

Present value of perpetuity=C/r

Where C is the annual return in dollars and r is the discount rate.

Illustration:
If someone were promised a cash flow of $400 per year until they died and they could earn 6% on other investments of similar quality, in present value terms the perpetuity would be worth $6,666.67.

Present value of perpetuity= ($400 / .06 = $6,666.67)

LESSON 04

DISCOUNTED CASH FLOW & EFFECTIVE ANNUAL INTEREST

We shall discuss the following in this hand out.

- **Discounted Cash Flow**
- **Effective Annual Interest**
- **Bond Valuation - introduction**

Discounted Cash Flows:

So far we assumed cash flow of same rupee level over a period of time. Like the way bond interest occurs – cash flow of interest remains at a constant level through to maturity. Often this is not the case when we move to other areas of valuation. The cash flow at the end of every period is different from the other and therefore, we need to calculate the present value of each cash flow by discount factor depending upon the time. For example, an investment opportunity yields cash flow of Rs. 100 after first year, Rs. 200 and Rs. 300 at the end of second and third year respectively shall be discounted at 10% rate with first year factor of 0.9090, second year 0.8264 and third year 0.7513. This means that we can't work out present value here like we did in case of annuities.

Effective Annual Rate – EAR

The Effective Annual Rate (EAR) is the interest rate that is annualized using compound interest. The EAR is the annualized equivalent of interest with shorter compounding periods. It can be calculated from the following formula:

$$EAR = [1 + i/n)^{n} - 1$$

Where n is the number of times (or periods) interest is compounded during the year and i is the interest rate per period.

Explanation:

The effective annual rate is a value used to compare different interest plans. If two plans were being compared, the interest plan with the higher effective annual rate would be considered the better plan. The interest plan with the higher effective annual rate would be the better earning plan.

For every compounding interest plan there is an effective annual rate. This effective annual rate is an imagined rate of simple interest that would yield the same final value as the compounding plan over one year.

When interest is compounded more than once in a year, EAR will be greater than the stated or quoted interest rate.

- Bank A pays 15% interest on deposit, compounded monthly.
- Bank B pays 15% interest on deposit, compounded quarterly.
- Bank C pays 15% interest on deposit, compounded half yearly.

Bank A $= 1 + .15/12^{12} - 1$

$= 1.16075 - 1$

$= 16.075\%$

Bank B $= 1 + .15/4^{4} - 1$

$= (1.0375)^{4} - 1$

$= 1.15865 - 1$

$= 15.865\%$

Bank C $= (1 + .15/2)^{2} - 1$

$= (1.075)^{2} - 1$

$= 1.155625 - 1$

$= 15.5625\%$

Example:

A bank offers 12% compounded quarterly. If you place 1000 in an account today, how much you have at the end of two years? What is EAR?

Solution:

$EAR = (1 + .12/4)^{4} - 1 = 12.55\%$

$= (1.1255)^{2} \times 1000 = 1266.75$

$=(1.03)^8$ X 1000 = 1.2667 X 1000 =1266.77

BOND VALUATION:

A bond is a financial instrument or a debt security issued by a company to raise money. It is offered to general public or to institutions.

Equity & Debt – (Bonds)

Equity represents ownership and is a residual claim

Features on Bond

Coupon Interest: stated interest payments per period

Face value: Also Par value. The principal amount

Coupon rate: interest payments stated in annualized term.

Maturity: specified future date on which principal will be repaid.

Yield to Maturity (YTM): Interest rate required in market on a bond.

Current yield= Annual coupon payment(s) divided by bond price.

Discount Bond: A bond which is sold less than the face or par value is discount bond.

Premium Bond: A bond which is sold more than the face or par value is premium bond

LESSON 05

BOND

Bond is a contract between an investor and the issuer – a company. It is a debt instrument that a company uses to raise the capital and in return pay interest to the investors at per the terms of contract. Bonds are redeemable – it means that after a period of time the company (issuer) returns the money to the investors and liquidates its liability. The rate at which issuer pays interest to investors is known as coupon rate.

Features of Bond:
Coupon Interest: stated interest payments per period
Face value: also Par value or the principal amount
Coupon rate: interest payments stated in annualized term.
Duration or maturity date: The date on which company returns the principal amount back to investors.
Current yield: Annual coupon payments divided by bond price.
Discount Bond: A bond which is sold less than the face or par value is discount bond.
Premium Bond: A bond which is sold more than the face or par value is premium bond.

Interest Rate Risk & Bonds
The risk arising from fluctuating interest rate is known as interest rate risk.
Interest rate risk depends on how sensitive bond price is to interest rate change.
This sensitivity depends upon two things:
- Time to maturity
- Coupon rate

A small change in interest rate will have greater impact on the on YTM and bond value.

BOND VALUATION:
Bond valuation is the process of determining the fair price of a bond. As with any security, the fair value of a bond is the present value of the stream of cash flows it is expected to generate. Hence, the price or value of a bond is determined by discounting the bond's expected cash flows to the present using the appropriate discount rate.

- General relationships
- Bond pricing

1) General relationships:
a) The present value relationship:
The fair price of a straight bond is determined by discounting the expected cash flows:
Cash flows:
The periodic coupon payments C, each of which is made once every period;
The par or face value F, which is payable at maturity of the bond after T periods.
Discount rate:
r is the market interest rate for new bond issues with similar risk ratings

Bond Price = $$P_0 = \sum_{t=1}^{T} \frac{C}{(1+r)^t} + \frac{F}{(1+r)^T}.$$

Because the price is the present value of the cash flows, there is an inverse relationship between price and discount rate: the higher the discount rates the lower the value of the bond (and vice versa). A bond trading below its face value is trading at a discount; a bond trading above its face value is at a premium.

b) Coupon yield:
The coupon yield is simply the coupon payment (C) as a percentage of the face value (F). Coupon yield is also called nominal yield.

Coupon yield = C / F

c) Current yield:
The current yield is simply the coupon payment (C) as a percentage of the bond price (P).

Current yield = C / P0

d) Yield to Maturity:
The yield to maturity (YTM), is the discount rate which returns the maket price of the bond. It is thus the internal rate of return of an investment in the bond made at the observed price. YTM can also be used to price a bond, where it is used as the required return on the bond.
Solve for YTM where

Market Price = $$\sum_{t=1}^{T} \frac{C}{(1+YTM)^t} + \frac{F}{(1+YTM)^T}.$$

To achieve a return equal to YTM, the bond owner must invest each coupon received at this rate.

Points to remember:
For a bond selling above the face value is said to sell at premium. It means investor who buys it at a premium face a capital loss over the life of bond. So return on bond will be less than the current yield.
For a bond selling below the face value is said to sell at discount. This means capital gain at maturity. The return on this bond is greater than its current yield.
If interest rates do not change, the bond price changes with time so that total return on the bond is equal to yield to maturity.
If YTM increases, the rate of return will be less than yield.
If the YTM decreases, the rate of return will be greater than yield.

2) Bond pricing:
a) Relative price approach:
Here the bond will be priced relative to a benchmark, usually a government security. The discount rate used to value the bond is determined based on the bond's rating relative to a government security with similar maturity. The better the quality of the bond, the smaller the spread between its required return and the YTM of the benchmark. This required return is then used to discount the bond cash flows.

b) Arbitrage free pricing approach:
In this approach, the bond price will reflect its arbitrage free price. Here, each cash flow is priced separately and is discounted at the same rate as the corresponding government issue Zero coupon bond. Since each bond cash flow is known with certainty, the bond price today must be equal to the sum of each of its cash flows discounted at the corresponding risk free rate - i.e. the corresponding government security.
Here the discount rate per cash flow, rt, must match that of the corresponding zero coupon bond's rate.

Bond Price = $$P_0 = \sum_{t=1}^{T} \frac{C}{(1+r_t)^t} + \frac{F}{(1+r_T)^T}.$$

LESSON 06

TERM STRUCTURE OF INTEREST RATES

The relationship between long tem & short-term rates is known as Term Structure.

Interest rates in short & long terms are different. Term structure tells us nominal interest rate on default free securities. When long-term rate is greater than short term then the term structure will be upward sloping and when short-term rate is greater than the long term, the term structure will be downward sloping.
The term structure of interest rates, also known as the yield curve, is a very common bond valuation method.
There are three main patterns created by the term structure of interest rates:

1) **Normal Yield Curve:**
As its name indicates, this is the yield curve shape that forms during normal market conditions, wherein investors generally believe that there will be no significant changes in the economy, such as in inflation rates, and that the economy will continue to grow at a normal rate. During such conditions, investors expect higher yields for fixed income instruments with long-term maturities that occur farther into the future. In other words, the market expects long-term fixed income securities to offer higher yields than short-term fixed income securities. This is a normal expectation of the market because short-term instruments generally hold less risk than long-term instruments; the farther into the future the bond's maturity, the more time and, therefore, uncertainty the bondholder faces before being paid back the principal. To invest in one instrument for a longer period of time, an investor needs to be compensated for undertaking the additional risk.
Remember that as general current interest rates increase, the price of a bond will decrease and its yield will increase.
2) **Flat Yield Curve:**
These curves indicate that the market environment is sending mixed signals to investors, who are interpreting interest rate movements in various ways. During such an environment, it is difficult for the market to determine whether interest rates will move significantly in either direction farther into the future. A flat yield curve usually occurs when the market is making a transition that emits different but simultaneous indications of what interest rates will do. In other words, there may be some signals that short-term interest rates will raise and other signals that long-term interest rates will fall. This condition will create a curve that is flatter than its normal positive slope. When the yield curve is flat, investors can maximize their risk/return tradeoff by choosing fixed-income securities with the least risk, or highest credit quality. In the rare instances wherein long-term interest rates decline, a flat curve can sometimes lead to an inverted curve.
3) **Inverted Yield Curve:**
These yield curves are rare, and they form during extraordinary market conditions wherein the expectations of investors are completely the inverse of those demonstrated by the normal yield curve. In such abnormal market environments, bonds with maturity dates further into the future are expected to offer lower yields than bonds with shorter maturities. The inverted yield curve indicates that the market currently expects interest rates to decline as time moves farther into the future, which in turn means the market expects yields of long-term bonds to decline. Remember, also, that as interest rates decrease, bond prices increase and yields decline.

You may be wondering why investors would choose to purchase long-term fixed-income investments when there is an inverted yield curve, which indicates that investors expect to receive less compensation for taking on more risk. Some investors, however, interpret an inverted curve as an indication that the economy will soon experience a slowdown, which causes future interest rates to give even lower yields. Before a slowdown, it is better to lock money into long-term investments at present prevailing yields, because future yields will be even lower.

REAL VS NOMINAL INTEREST RATES:

The nominal interest rate is the amount, in money terms, of interest payable.
For example, suppose household deposits $100 with a bank for 1 year and they receive interest of $10. At the end of the year their balance is $110. In this case, the nominal interest rate is 10% per annum.

The real interest rate, which measures the purchasing power of interest receipts, is calculated by adjusting the nominal rate charged to take inflation into account.
If inflation in the economy has been 10% in the year, then the $110 in the account at the end of the year buys the same amount as the $100 did a year ago. The real interest rate, in this case, is zero.
After the fact, the 'realized' real interest rate, which has actually occurred, is:
ir = in — p
where p = the actual inflation rate over the year.
The expected real returns on an investment, before it is made, are:
ir = in — pe
where:
in = nominal interest rate
ir = real interest rate
pe = expected or projected inflation over the year.

Market interest rates
There is a market for investments which ultimately includes the money market, bond market, stock market and currency market as well as retail financial institutions like banks.
Exactly how these markets function is a complex question. However, economists generally agree that the interest rates yielded by any investment take into account:

The risk-free cost of capital
Inflationary expectations
The level of risk in the investment
The costs of the transaction

Risk-free cost of capital
The risk-free cost of capital is the real interest on a risk-free loan. While no loan is ever entirely risk-free, bills issued by major nations are generally regarded as risk-free benchmarks.
This rate incorporates the deferred consumption and alternative investments elements of interest.

Inflationary expectations
According to the theory of rational expectations, people form an expectation of what will happen to inflation in the future. They then ensure that they offer or ask a nominal interest rate that means they have the appropriate real interest rate on their investment.
This is given by the formula:
in = ir + pe
Where:
in = offered nominal interest rate
ir = desired real interest rate
pe = inflationary expectations

Risk
The level of risk in investments is taken into consideration. This is why very volatile investments like shares and junk bonds have higher returns than safer ones like government bonds.
The extra interest charged on a risky investment is the risk premium. The required risk premium is dependent on the risk preferences of the lender.
If an investment is 50% likely to go bankrupt, a risk-neutral lender will require their returns to double. So for an investment normally returning $100 they would require $200 back. A risk-averse lender would require more than $200 back and a risk-loving lender less than $200. Evidence suggests that most lenders are in fact risk-averse.
Generally speaking a longer-term investment carries a maturity risk premium, because long-term loans are exposed to more risk of default during their duration.

Liquidity preference
Most investors prefer their money to be in cash than in less fungible investments. Cash is on hand to be spent immediately if the need arises, but some investments require time or effort to transfer into spend able

form. This is known as liquidity preference. A 10-year loan, for instance, is very illiquid compared to a 1-year loan. A 10-year US Treasury bond, however, is liquid because it can easily be sold on the market.

LESSON 07

COMMON STOCK VALUATION (Dividend Models)

A company can raise capital from variety of sources. We already covered the loans as a potential source of capital enhancement. Bonds are a kind of loan that is different form a bank loan.
In this segment, we know that a company may sell its shares to general public (primary market) to gather funds needed for investment purposes. These shares are significantly different from the Bonds in many aspects. For example, the salient features of a stock or share are as under:

- No promised cash flow for dividend
- No date of maturity – Investment for ever
- Problems in observing rate of return

Common stock, also referred to as common shares, is as the name implies the most usual and commonly held form of stock in a corporation. The other type of shares that the public can hold in a corporation is known as preferred stock. Common stock that has been re-purchased by the corporation is known as treasury stock and is available for a variety of corporate uses.

Common stock typically has voting rights in corporate decision matters, though perhaps different rights from preferred stock. In order of priority in a liquidation of a corporation, the owners of common stock are near the last. Dividends paid to the stockholders must be paid to preferred shares before being paid to common stock shareholders.

COMMON STOCK VALUATION:
The following models are commonly used to valuate the common stock:

DIVIDEND DISCOUNT MODEL:
It is not an easy job to predict or forecast future stock price.
Dividend discount model states that today's price is equal to the present value of all future dividends.
After One year
$P_0 = Div + P_1 / (1 + r)$
After 2 years the value of stock is:
$=div_1/ (1+r) + div_2+P_2/ (1+r)^2$

After 3 years the value of stock is:
$=div_1/(1+r) + div_2/(1+r)^2 + div_3+P_3/(1+r)^3$

When the time horizon is infinitely far, then we do not consider the final price as it has no present value today. This mean the PV of stock depends only on future dividends.

DIVIDEND GROWTH MODELS:

- Assumed NO GROWTH by the company
- Company pays out all as dividend what it earns every year.
- It means that NOTHING is reinvested in business.
- It means that investors may forecast that future dividends will not increase. Dividends over the years are at the same level – perpetuity.

If the value of stock is the PV of all future dividend then

$$PV = DIV / r$$

When company pay out everything as dividend then earnings and dividend will be equal and PV can be calculated as:

$$PV = EPS / r$$

CONSTANT GROWHT MODEL:
Assume that dividends will grow at a constant growth rate. For example 5% per year.

$Div_2 = 2 \times 1.05 = 2.10$

$Div_3 = 2 \times (1.05)^2 = 2.205$

Fitting these into formula:

$= D_1/1+r + D_1(1+g)/(1+r)^2 + D_1(1+g)^2/(1+r)^3 \cdots$

$= 2/1.12 + 2.10/ (1.12)^2 + 2.205/ (1.12)^3 = 1.79 + 1.67 + 1.57 + \ldots.$

Although the number of terms is infinite, the PV of dividend is proportionately smaller than the preceding term and this will continue as long as growth rate is less than the discount rate.

Because the far distant dividends will be close to zero, the sum of all of these terms is finite despite the fact that an infinite number of dividends will be paid.

So we can write equation as:

$P_0 = D_1 \times (1+g) / (r - g)$

This is known as Constant-growth Dividend Discount Model or Gordon Growth Model.

For example:

$2 \times 1.05 / .12 - .05 = 30.00$

Gordon model is valid as long as $g < r$

Example:

Dividend paid = Rs. 2.30

Growth rate = 5%

Required return = 13%

What will be the value of stock after five years?

$D_5 = 2.30 \text{ X } (1.05)^5 = 2.935$

$P_5 = 2.935 \times 1.05 / (.13 - .05) = 38.53$

Example:

The next dividend of a company will be Rs 4 per share. Investors demand 16 percent return on share having same risk level as of this company. The dividend growth is 6% per year. Calculate the value of this company's stock today and in four years using dividend growth model.

Solution:

Next dividend has already been given:

$P_o = D_1 / (r - g)$

$P_o = 4 / (.16 - .06)$

$P_o = 40$

Price in 4 years:

$D_4 = 4 \times (1.06)^3 = 4.764$

$P_4 = 4.764 \times 1.06 / (0.16 - 0.06) = 50.50$

LESSON 08

CAPITAL BUDGETING

The following topics will be discussed in this hand out.

- Fundamental Analysis
- Capital Budgeting Definition and Process
- Relevant costs
- Non-relevant cost

Fundamental Analysis:

Fundamental Analysis is a security or stock valuation method that uses financial and economic analysis to evaluate businesses or to predict the movement of security prices such as stock prices or bond prices. The fundamental information that is analyzed can include a company's financial reports, and non-financial information such as estimates of the growth of demand for competing products, industry comparisons, analysis of the effects of new regulations or demographic changes, and economy-wide changes. It is commonly contrasted with so-called technical analysis which analyzes security price movements without reference to factors outside of the market itself.
A potential (or current) investor uses fundamental analysis to examine a company's financial results, its operations and the market(s) in which the company is competing to understand the stability and growth potential of that company. Company factors to consider might include dividends paid, the way a company manages its cash, the amount of debt a company has, and the growth of a company's revenues, expenses and earnings. A fundamental analyst may enter long or short positions based on the result of fundamental analysis.

Three step process:
In large organizations fundamental analysis is usually performed in three steps:

- Analysis of the macroeconomic situation, usually including both international and national economic indicators, such as GDP growth rates, inflation, interest rates, exchange rates, productivity, and energy prices.
- Industry analysis of total sales, price levels, the effects of competing products, foreign competition, and entry or exit from the industry.
- Individual firm analysis of unit sales, prices, new products, earnings, and the possibilities of new debt or equity issues.

Often the procedure stresses the effects of the overall economic situation on industry and firm analysis and is known as *top down* analysis. If instead the procedure stresses firm analysis and uses it to build its industry analysis, which it uses to build its macroeconomic analysis, it is known as *bottom up* analysis.

Criticisms:

- Some economists such as Burton Malkiel suggest that neither fundamental analysis nor technical analysis is useful in outperforming the markets.

Capital budgeting:
Capital Budgeting is the planning process used to determine a firm's long term investments such as new machinery, replacement machinery, new plants, new products, and research and development projects.
Capital budgeting process is carried out for projects involving heavy initial upfront cost.
These projects can take any of the following forms:

- New project
- Expansion project
- Modernization / Replacement
- Research & development
- Exploration
- Other / social responsibility – Pollution control etc.

Capital Budgeting Process:

- Investment Opportunity (ies) is/are identified.
- Different alternatives are considered.
- Every alternative is evaluated
- The best option(s) are undertaken

Many formal methods are used in capital budgeting, including discounted cash flow techniques such as net present value, internal rate of return, Modified Internal Rate of Return and equivalent annuity method, using the incremental cash flows from each potential investment, or project. Techniques based on accounting earnings and accounting rules are sometimes used - though economists consider this to be improper - such as the accounting rate of return, and "return on investment." Simplified and hybrid methods are used as well, such as payback period and discounted payback period.

Capital budgeting versus current expenditures:
frA capital investment project can be distinguished from current expenditures by two features:
a) Such projects are relatively large
b) A significant period of time (more than one year) elapses between the investment outlay and the receipt of the benefits..

As a result, most medium-sized and large organizations have developed special procedures and methods for dealing with these decisions. A systematic approach to capital budgeting implies:

a) The formulation of long-term goals
b) The creative search for and identification of new investment opportunities
c) Classification of projects and recognition of economically and/or statistically dependent proposals
d) The estimation and forecasting of current and future cash flows
e) A suitable administrative framework capable of transferring the required information to the decision level
f) The controlling of expenditures and careful monitoring of crucial aspects of project execution
g) A set of decision rules which can differentiate acceptable from unacceptable alternatives is required.
The last point (g) is crucial and this is the subject of later sections of the chapter.

The classification of investment projects

a) By project size
Small projects may be approved by departmental managers. More careful analysis and Board of Directors' approval is needed for large projects of, say, half a million dollars or more.

b) By type of benefit to the firm

- an increase in cash flow
- a decrease in risk
- an indirect benefit (showers for workers, etc).

c) By degree of dependence

- Mutually exclusive projects (can execute project A or B, but not both)
- Complementary projects: taking project A increases the cash flow of project B.
- Substitute projects: taking project A decreases the cash flow of project B.

d) By degree of statistical dependence

- Positive dependence
- Negative dependence
- Statistical independence.

e) By type of cash flow

- Conventional cash flow: only one change in the cash flow sign
  e.g. -/++++ or +/----, etc
- Non-conventional cash flows: more than one change in the cash flow sign,
  e.g. +/-/+++ or -/+/-/++++, etc.

Relevant Costs:

These are costs that are relevant with respect to a particular decision. A relevant cost for a particular decision is one that changes if an alternative course of action is taken. Relevant costs are also called differential costs.

Making correct decisions is one of the most important tasks of a successful manager. Every decision involves a choice between at least two alternatives. The decision process may be complicated by volumes of data, irrelevant data, incomplete information, an unlimited array of alternatives, etc. The role of the managerial accountant in this process is often that of a gatherer and summarizer of relevant information rather than the ultimate decision maker.

The costs and benefits of the alternatives need to be compared and contrasted before making a decision. The decision should be based only on RELEVANT information. Relevant information includes the predicted future costs and revenues that differ among the alternatives. Any cost or benefit that does not differ between alternatives is irrelevant and can be ignored in a decision. All future revenues and/or costs that do not differ between the alternatives are irrelevant. Sunk costs (costs already irrevocably incurred) are always irrelevant since they will be the same for any alternative.

To identify which costs are relevant in a particular situation, take this three step approach:

1. Eliminate sunk costs and committed costs
2. Eliminate costs and benefits that do not differ between alternatives
3. Compare the remaining costs and benefits that do differ between alternatives to make the proper decision.
4. Take care of opportunity cost.

LESSON 09

METHODS OF PROJECT EVALUATIONS

The following topics will be discussed in this hand out.
Methods of Project evaluations:

- NPV

Associated topics that will be covered are:

- Weighted Average Cost of Capital
- Opportunity cost

Net present value (NPV)

There are two aspects of NPV method of project evaluation. First is the initial investment or upfront cost and second, is the benefits (like cash flow) emerging from the project.
First aspect is pretty simple. As it is incurred in the current or present time, there are no issues associated with its measurement. On the other side, benefits shall be reaped in future and involves time value of money, making the measurement complex and difficult.
NPV measures the NET benefit by which the value of a firm would increase in case the project in undertaken.
As on overview of this method, the present value of future cash flow is calculated using a discount rate. And if this PV of future cash flow is greater than the initial investment, the NPV is stated as "positive". Alternatively, this suggests that project is worth undertaking and financially viable. If the PV of future cash flow is less than initial investment, then it is better to scrap the project.
The NPV method is used for evaluating the desirability of investments or projects. Net Present Value is found by subtracting the required investment:
NPV = PV – required investment
The building worth Rs. 2,000,000, but this does not mean that you are Rs. 2,000,000 better off. You committed Rs. 1,900,000, and therefore your net present value is calculated by using the above formula:
NPV = 2,000,000 – 1,900,000 = Rs. 100,000
In other words, your office development is worth more than it costs, it makes a net contribution to value.

The formula for calculating NPV can be written as:
NPV = Co + C1 / 1 + r
Where:
Co = the cash flow at time o or investment and therefore cash outflow
r = the discount rate/the required minimum rate of return on investment
The discount factor r can be calculated using:

$$q(t,i) = \frac{1}{(1+i)^t}$$

Examples:

$$q(1,10\%) = \frac{1}{1.1} = 0.9091$$

$$q(2,10\%) = \frac{1}{(1.1)^2} = 0.8264$$

$$q(3,10\%) = \frac{1}{(1.1)^3} = 0.7513$$

Decision rule:
If NPV is positive (+): accept the project
If NPV is negative (-): reject the project

Weighted Average Cost of Capital:

WACC calculation.
WACC is calculated by multiplying the cost of each capital component by its proportional weight and then summing:

WACC = E / V * Re + D / V * Rd * (1 – Tc)

Where:
Re = cost of equity
Rd = cost of debt
E = market value of the firm's equity
D = market value of the firm's debt
V = E + D
E/V = percentage of financing that is equity
D/V = percentage of financing that is debt
Tc = corporate tax rate

Broadly speaking, a company's assets are financed by either debt or equity. WACC is the average of the costs of these sources of financing, each of which is weighted by its respective use in the given situation. By taking a weighted average, we can see how much interest the company has to pay for every dollar it finances.

A firm's WACC is the overall required return on the firm as a whole and, as such, it is often used internally by company directors to determine the economic feasibility of expansionary opportunities and mergers. It is the appropriate discount rate to use for cash flows with risk that is similar to that of the overall firm.

Opportunity Cost:
The cost of an alternative that must be forgone in order to pursue a certain action is called opportunity cost. Put another way, the benefits you could have received by taking an alternative action.

There is a difference in return between a chosen investment and one that is necessarily passed up. Say you invest in a stock and it returns a paltry 2% over the year. In placing your money in the stock, you gave up the opportunity of another investment - say, a risk-free government bond yielding 6%. In this situation, your opportunity costs are 4% (6%-2%).

The opportunity cost of going to college is the money you would have earned if you worked instead. On the one hand, you lose four years of salary while getting your degree; on the other hand, you hope to earn more during your career, thanks to your education, to offset the lost wages.

Here's another example: if a gardener decides to grow carrots, his or her opportunity cost is the alternative crop that might have been grown instead (potatoes, tomatoes, pumpkins, etc.).

In both cases, a choice between two options must be made. It would be an easy decision if you knew the end outcome; however, the risk that you could achieve greater "benefits" (be they monetary or otherwise) with another option is the opportunity cost.

LESSON 10

METHODS OF PROJECT EVALUATIONS

The following topics will be discussed in this hand out.

Methods of Project evaluations:

- Internal Rate of Return – IRR

Associated topics to be covered:

- NPV vs. IRR
- Criticism of IRR

The Internal Rate of Return (IRR)

The IRR is the discount rate at which the NPV for a project equals zero. This rate means that the present value of the cash inflows for the project would equal the present value of its outflows.

The IRR is the break-even discount rate.

The IRR is found by trial and error.

$$\sum_{t-1}^{n} \frac{C_t}{(I+r)^t} - I_o = o$$

Where r = IRR

IRR of an annuity:

$$\mathbf{Q(n,r)} = \frac{I_o}{C}$$

Where:

Q (n, r) is the discount factor

$\mathbf{I_o}$ is the initial outlay

C is the uniform annual receipt ($C_1 = C_2 = ... = C_n$).

Example:

What is the IRR of an equal annual income of $20 per annum which accrues for 7 years and costs $120?

$$Q(7,r) = \frac{\$120}{20}$$

= 6

Net present value vs. Internal rate of return:

Independent vs. dependent projects

NPV and IRR methods are closely related because:

i) both are time-adjusted measures of profitability, and

ii) Their mathematical formulas are almost identical.

So, which method leads to an optimal decision: IRR or NPV?

a) **NPV vs. IRR: Independent projects**

Independent project: Selecting one project does not preclude the choosing of the other.

With conventional cash flows (-|+|+) no conflict in decision arises; in this case both NPV and IRR lead to the same accept/reject decisions.

Mathematical proof: for a project to be acceptable, the NPV must be positive, i.e.

$$\sum_{t-1}^{n} \frac{C_t}{(I+k)^t} - I_o > 0 or \sum_{t-1}^{n} \frac{C_t}{(I+k)^t} - I_o > I_o$$

Similarly for the same project to be acceptable:

$$\sum_{t-1}^{n} \frac{C_t}{(I+R)^t} = I_o$$

Where **R** is the IRR.

Since the numerators C_t are identical and positive in both instances:

* Implicitly/intuitively R must be greater than k (R > k);
* If NPV = 0 then R = k: the company is indifferent to such a project;
* Hence, IRR and NPV lead to the same decision in this case.

b) **NPV vs. IRR: Dependent projects**

NPV clashes with IRR where mutually exclusive projects exist.

Example:
Agritex is considering building either a one-storey (Project A) or five-storey (Project B) block of offices on a prime site. The following information is available:

	Initial Investment Outlay	Net Inflow at the Year End
Project A	-9,500	11,500
Project B	-15,000	18,000

Assume k = 10%, which project should Agritex undertake?

$$NPV_A = \frac{\$11{,}500}{1.1} - \$9{,}500$$

= $954.55

$$NPV_B = \frac{\$18{,}000}{1.1} - \$15{,}000$$

= $1,363.64

Both projects are of one-year duration:

IRR_A: $\frac{\$11{,}500}{1+R_A} = \$9{,}500$

$11,500 = $9,500 $(1 + R_A)$

$$\frac{\$11{,}500}{\$9{,}500} = 1 + R_A$$

$$R_A = \frac{\$11{,}500}{\$9{,}500} - 1$$

= 1.21-1

Therefore **IRR_A** = 21%

IRR_B: $\frac{\$18{,}000}{1+R_B} = \$15{,}000$

$18,000 = $15,000$(1 + R_B)$

$$R_B = \frac{\$18{,}000}{\$15{,}000} - 1$$

= 1.2-1

Therefore **IRR_B** = 20%

Decision:
Assuming that k = 10%, both projects are acceptable because:
NPV_A and NPV_B are both positive
IRR_A > k AND IRR_B > k
Which project is a "better option" for Agritex?
If we use the NPV method:
NPV_B ($1,363.64) > NPV_A ($954.55): Agritex should choose Project B.
If we use the IRR method:
IRR_A (21%) > IRR_B (20%): Agritex should choose Project A.

Differences in the scale of investment
NPV and IRR may give conflicting decisions where projects differ in their scale of investment. Example:

Years	0	1	2	3
Project A	-2,500	1,500	1,500	1,500
Project B	-14,000	7,000	7,000	7,000

Assume k= 10%.

NPV_A = $1,500 x PVFA at 10% for 3 years
= $1,500 x 2.487
= $3,730.50 - $2,500.00
= $1,230.50.

NPV_B == $7,000 x PVFA at 10% for 3 years
= $7,000 x 2.487
= $17,409 - $14,000
= $3,409.00.

IRR_A =

$$\frac{I_o}{C_t}$$

$$= \frac{\$2,500}{\$1,500}$$

= 1.67.
Therefore **IRR_A** = 36% (from the tables)

IRR_B =

$$\frac{I_o}{C_t}$$

$$= \frac{\$14,000}{\$7,000}$$

= 2.0
Therefore **IRR_B** = 21%

Decision:
Conflicting, as:

- NPV prefers B to A
- IRR prefers A to B

	NPV	IRR
Project A	$ 3,730.50	36%
Project B	$17,400.00	21%

To show why:

i) The NPV prefers B, the larger project, for a discount rate below 20%
ii) The NPV is superior to the IRR

a) Use the incremental cash flow approach, "B minus A" approach
b) Choosing project B is tantamount to choosing a hypothetical project "B minus A".

	0	1	2	3
Project B	- 14,000	7,000	7,000	7,000
Project A	- 2,500	1,500	1,500	1,500
"B minus A"	- 11,500	5,500	5,500	5,500

$$IRR_{\text{"B Minus A"}} = \frac{\$11,500}{\$5,500}$$

= 2.09

= 20%

c) Choosing B is equivalent to: A + (B - A) = B
d) Choosing the bigger project B means choosing the smaller project A plus an additional outlay of $11,500 of which $5,500 will be realized each year for the next 3 years.
e) The $IRR_{\text{"B minus A"}}$ on the incremental cash flow is 20%.
f) Given k of 10%, this is a profitable opportunity, therefore must be accepted.
g) But, if k were greater than the IRR (20%) on the incremental CF, then reject project.
h) At the point of intersection,
$NPV_A = NPV_B$ or $NPV_A - NPV_B = 0$, i.e. indifferent to projects A and B.
i) If k = 20% (IRR of "B - A") the company should accept project A.
This justifies the use of NPV criterion.

Advantage of NPV:
It ensures that the firm reaches an optimal scale of investment.

Disadvantage of IRR:

- It expresses the return in a percentage form rather than in terms of absolute dollar returns, e.g. the IRR will prefer 500% of $1 to 20% return on $100. However, most companies set their goals in absolute terms and not in % terms, e.g. target sales figure of $2.5 million.

The timing of the cash flow

The IRR may give conflicting decisions where the timing of cash flows varies between the 2 projects. Note that initial outlay I_o is the same.

	0	**1**	**2**
Project A	- 100	20	125.00
Project B	- 100	100	31.25
"A minus B"	0	- 80	88.15

Assume k = 10%

	NPV	**IRR**
Project A	17.3	20.0%
Project B	16.7	25.0%
"A minus B"	0.6	10.9%

IRR prefers B to A even though both projects have identical initial outlays. So, the decision is to accept A, that is B + (A - B) = A.

The horizon problem
NPV and IRR rankings are contradictory. Project A earns $120 at the end of the first year while project B earns $174 at the end of the fourth year.

	0	**1**	**2**	**3**	**4**
Project A	-100	120	-	-	-
Project B	-100	-	-	-	174

Assume k = 10%

	NPV	IRR
Project A	9	20%
Project B	19	15%

Decision:
NPV prefers B to A.
IRR prefers A to B.

LESSON 11

METHODS OF PROJECT EVALUATIONS

The following topics will be discussed in this hand out.
Methods of Project evaluations:

- Payback Period Method
- Discounted Payback Period
- Accounting Rate of Return ARR
- Profitability Index PI

➢ THE PAYBACK PERIOD (PP)

The time it takes the cash inflows from a capital investment project to equal the cash outflows, usually expressed in years'. When deciding between two or more competing projects, the usual decision is to accept the one with the shortest payback.
Payback is often used as a "first screening method". By this, we mean that when a capital investment project is being considered, the first question to ask is: 'How long will it take to pay back its cost?' The company might have a target payback, and so it would reject a capital project unless its payback period was less than a certain number of years.
Example 1:

Years	0	1	2	3	4	5
Project A	1,000,000	250,000	250,000	250,000	250,000	250,000

For a project with equal annual receipts:

$$PP = \frac{I_o}{C_t}$$

$$= \frac{\$1,000,000}{\$250,000}$$

= 4 years

Example 2:

Years	0	1	2	3	4
Project B	- 10,000	5,000	2,500	4,000	1,000

Payback period lies between year 2 and year 3. Sum of money recovered by the end of the second year
= $7,500, i.e. ($5,000 + $2,500)
Sum of money to be recovered by end of 3rd year
= $10,000 - $7,500
= $2,500

$$\text{Payback period} = \left(2 + \frac{\$2,500}{\$4,000}\right) years$$

= 2.625 years

Disadvantages of the payback method:

* It ignores the timing of cash flows within the payback period, the cash flows after the end of payback period and therefore the total project return.
* It ignores the time value of money. This means that it does not take into account the fact that $1 today is worth more than $1 in one year's time. An investor who has $1 today can either consume it immediately or alternatively can invest it at the prevailing interest rate, say 30%, to get a return of $1.30 in a year's time.
* It is unable to distinguish between projects with the same payback period.

* It may lead to excessive investment in short-term projects.

Advantages of the payback method:

- Payback can be important: long payback means capital tied up and high investment risk. The method also has the advantage that it involves a quick, simple calculation and an easily understood concept.

➢ DISCOUNTED PAYBACK PERIOD:

Length of time required to recover the initial cash outflow from the *discounted* future cash inflows. This is the approach where the present values of cash inflows are cumulated until they equal the initial investment. For example, assume a machine purchased for $5000 yields cash inflows of $5000, $4000, and $4000. The cost of capital is 10%. Then we have

Year	Cash Flow	PV Factor at 10%	PV of Cash Flow
1	$5000	.909	$4545
2	4000	.826	3304
3	4000	.751	3004

The payback period (without discounting the future cash flows) is exactly 1 year. However, the discounted payback period is a little over 1 year because the first year discounted cash flow of $4545 is not enough to cover the initial investment of $5000. The discounted payback period is 1.14 years (1 year + ($5000 - $4545)/$3304 = 1 year + .14 year).

➢ THE ACCOUNTING RATE OF RETURN - (ARR):

The ARR method also called the return on capital employed (ROCE) or the return on investment (ROI) method of appraising a capital project is to estimate the accounting rate of return that the project should yield. If it exceeds a target rate of return, the project will be undertaken.

$$\text{ARR on total investment} = \frac{\text{Net Annual Profit}}{\text{Investment Outlay}} \text{ or } \left[Rt + \frac{(C - D)}{I_o} \right]$$

Note that net annual profit excludes depreciation.
Example:
A project has an initial outlay of $1 million and generates net receipts of $250,000 for 10 years.
Assuming straight-line depreciation of $100,000 per year:

$$\text{the RR on total investment} = \frac{\$250,000 - \$100,000}{1,000,000}$$

= 15%

$$\text{ARR on total investment} = \frac{\text{Net Annual Profit}}{\text{Investment Outlay} / 2} \text{ or } \left[R_a + \frac{(C - D)}{I_o / 2} \right]$$

$$= \frac{\$250,000 - \$100,000}{\$1,000,000 \div 2}$$

$$= \frac{\$150,000}{\$500,000}$$

= 30%

Disadvantages:

* It does not take account of the timing of the profits from an investment.
* It implicitly assumes stable cash receipts over time.

* It is based on accounting profits and not cash flows. Accounting profits are subject to a number of different accounting treatments.
* It is a relative measure rather than an absolute measure and hence takes no account of the size of the investment.
* It takes no account of the length of the project.
* It ignores the time value of money.

The payback and ARR methods in practice:
Despite the limitations of the payback method, it is the method most widely used in practice. There are a number of reasons for this:
* It is a particularly useful approach for ranking projects where a firm faces liquidity constraints and requires fast repayment of investments.
* It is appropriate in situations where risky investments are made in uncertain markets that are subject to fast design and product changes or where future cash flows are particularly difficult to predict.
* The method is often used in conjunction with NPV or IRR method and acts as a first screening device to identify projects which are worthy of further investigation.
* It is easily understood by all levels of management.
* It provides an important summary method: how quickly will the initial investment be recouped?

➢ THE PROFITABILITY INDEX – PI:

This is also known as benefit-cost ratio. It is a relationship between the PV of all the future cash flows and the initial investment. This relationship is expressed as a number calculated by dividing the PV of all cash flows by initial investment.

This is a variant of the NPV method.

$$\mathbf{PI} = \frac{PV}{I_o}$$

Decision rule:
PI > 1; accept the project
PI < 1; reject the project
If NPV = 0, we have:
NPV = PV - I_o = 0
PV = I_o

Dividing both sides by I_o we get:

$$\frac{PV}{I_o} > 1$$

PI of 1.2 means that the project's profitability is 20%.
Example:

	PV of CF	**I_o**	**PI**
Project A	100	50	2.0
Project B	1,500	1,000	1.5

Decision:
Choose option B because it maximizes the firm's profitability by $1,500.

Disadvantage of PI:
Like IRR it is a percentage and therefore ignores the scale of investment.

The NPV method is preferred over the PI method. This is because PI greater than 1 implies that the Net Present Value of the project is positive. Secondly, NPV clearly states whether to undertake or reject a project or not and return a dollar value by which the economic contribution is made to value of firm. This is not the case with PI which only expresses the relative profitability of projects being considered.

LESSON 12

ADVANCE EVALUATION METHODS

The following topics will be discussed in this lecture.

Advance Evaluation Methods:

- Sensitivity analysis
- Profitability analysis
- Break even accounting
- Break even - economic

SENSITIVITY ANALYSIS:

Sensitivity analysis is the study of how the variation in the output of a model (numerical or otherwise) can be apportioned, qualitatively or quantitatively, to different sources of variation.

A mathematical model is defined by a series of equations, input factors, parameters, and variables aimed to characterize the process being investigated. Input is subject to many sources of uncertainty including errors of measurement, absence of information and poor or partial understanding of the driving forces and mechanisms.

This imposes a limit on our confidence in the response or output of the model. Further, models may have to cope with the natural intrinsic variability of the system, such as the occurrence of stochastic events. Good modeling practice requires that the modeler provides an evaluation of the confidence in the model, possibly assessing the uncertainties associated with the modeling process and with the outcome of the model itself. Uncertainty and Sensitivity Analysis offer valid tools for characterizing the uncertainty associated with a model.

Applications

Sensitivity Analysis can be used to determine:

1. The model resemblance with the process under study
2. The quality of model definition
3. Factors that mostly contribute to the output variability
4. The region in the space of input factors for which the model variation is maximum
5. Optimal - or instability - regions within the space of factors for use in a subsequent calibration study
6. Interactions between factors
7. Sensitivity Analysis is popular in financial applications, risk analysis, signal processing, neutrals networks and any area where models are developed.

Methodology

There are several possible procedures to perform uncertainty (UA) and sensitivity analysis (SA). The most common sensitivity analysis is sampling-based. A sampling-based sensitivity is one in which the model is executed repeatedly for combinations of values sampled from the distribution (assumed known) of the input factors. Other methods are based on the decomposition of the variance of the model output and are model independent.

In general, UA and SA are performed jointly by executing the model repeatedly for combination of factor values sampled with some probability distribution. The following steps can be listed:

1. Specify the target function and select the input of interest
2. Assign a distribution function to the selected factors
3. Generate a matrix of inputs with that distribution(s) through an appropriate design
4. Evaluate the model and compute the distribution of the target function
5. Select a method for assessing the influence or relative importance of each input factor on the target function.

PROFITABILITY ANALYSIS

Successful financial institutions today are able to effectively identify those products, customers, branches, and other factors that impact overall profitability. But discovering what's actually profitable isn't always straightforward. To really understand what's driving bank profitability, you need to be able to drill down into the lowest level of detail, and analyze data with ease and precision.

Profitability is a dynamic, accountable solution for managing customer relationships and measuring

performance – providing a complete picture of your organization's profitability. It allows you to analyze your business across unlimited dimensions. Beyond customer profitability, product profitability and organizational profitability, it's sophisticated, multi-dimensional OLAP environment provides the unique ability to calculate profitability at the account level, drill up and down through every level of the hierarchy, and aggregate up for any reporting or analytical dimension, for improved accuracy and better decision-making.

This flexibility allows you to analyze…

- Customers who are 'at risk'
- Performance of an officer that supports multiple business units
- Business unit performance across a group of branches
- Customer households reported in multiple market segments
- Geographic views that aren't aligned with organizational units
- Product success across a group of market segments
- Origination trends by groups of officers, branches, or by market segment

BREAK-EVEN ACCOUNTING

This type of report is not one that is automatically generated by most accounting software, nor is it one that is normally produced by your accountant, but it is an important analysis for you to have and understand. For any new business, you should predict what gross sales volume level you will have to achieve before you reach the break-even point and then, of course, build to make a profit. For early-stage businesses, you should be able to assess your early prediction and determine how accurate they were, and monitor whether you are actually on track to make the profits you need. Even the mature business would be wise to look at their current break-even point and perhaps find ways to lower that benchmark to increase profits. The recent massive layoffs at large corporations are directed at this goal, lowering the break-even point and increasing profits.

Break-Even Is the Volume Where All Fixed Expenses Are Covered:

You will start a break-even analysis by establishing all the fixed (overhead) expenses of your business. Since most of these are done on a monthly basis, don't forget to include the estimated monthly amount of line items that are normally paid on a quarterly or annual basis such as payroll taxes or insurance. For example, if your annual insurance charge is $9,000, use 1/12 of that, or $750 as part of your monthly budget. With the semi variable expense (such as phone charges, travel, and marketing), use that portion that you expect to spend each and every month.

For the purpose of a model break-even, let's assume that the fixed expenses look as follows:

Administrative salaries	$1,500
Rent	800
Utilities	300
Insurance	150
Taxes	210
Telephone	240
Auto expense	400
Supplies	100
Sales and marketing	300
Interest	100
Miscellaneous	400
Total	$4,500

These are the expenses that must be covered by your gross profit. Assuming that the gross profit margin is 30 percent, what volume must you have to cover this expense? The answer in this case is 15,000—30 percent of that amount is $4,500, which is your target number.

The two critical numbers in these calculations are the total of the fixed expense and the percentage of gross profit margin. If your fixed expense is $10,000 and your gross profit margin is 25 percent, your break-even volume must be $40,000.

This Is Not a Static Number:
You may do a break-even analysis before you even begin your business and determine that your gross margin will come in at a certain percentage and your fixed expense budget will be set at a certain level. You will then be able to establish that your business will break even (and then go on to a profit) at a certain level of sales volume. But your pre-start projections and your operating realities may be very different. After three to six months in business, you should compare projections to the real-world results and reassess, if necessary, what volume is required to reach break-even levels.
Along the way, expenses tend to creep up in both the direct and indirect categories, and you may fall below the break-even volume because you think it is lower than it has become. Take your profit and loss statement every six months or so and refigure your break-even target number.

Ways to Lower Break-Even:
There are three ways to lower your break-even volume, only two of them involve cost controls (which should always be your goal on an ongoing basis).
1. Lower direct costs, which will raise the gross margin. Be more diligent about purchasing material, controlling inventory, or increasing the productivity of your labor by more cost effective scheduling or adding more efficient technology.
2. Exercise cost controls on your fixed expense, and lower the necessary total dollars. Be careful when cutting expenses that you do so with an overall plan in mind. You can cut too deeply as well as too little and cause distress among workers, or you may pull back marketing efforts at the wrong time, which will give out the wrong signal.
3. Raise prices! Most entrepreneurs are reluctant to raise prices because they think that overall business will fall off. More often than not that doesn't happen unless you are in a very price-sensitive market, and if you are, you really have already become volume driven.
But if you are in the typical niche-type small business, you can raise your prices 4 to 5 percent without much notice of your customers. The effect is startling. For example, the first model we looked at was the following:

Volume	$15,000	
direct cost	10,500	70%
gross profit	4,500	

Raising the prices 5 percent would result in this change:

Volume	$15,750	
direct cost	10,500	67%
gross profit	5,250	

You will have increased your margin by 3 percent, so you can lower the total volume you will require to break even.

The Goal Is Profit:
You are in business to make a profit not just break even, but by knowing where that number is, you can accomplish a good bit:

- You can allocate the sales and marketing effort to get you to the point you need to be.
- Most companies have slow months, so if you project volume below break-even, you can watch expenses to minimize losses. A few really bad months can wipe out a good bit of previous profit.
- Knowing the elements of break-even allows you to manage the costs to maximize the bottom line.

Once you have gotten this far in the knowledge of the elements of your business, you are well on your way to success.

The **breakeven point** in economics is the point at which cost or expenses and income are equal - there is no net loss or gain, one has "broken even".
The point at which a firm or other economic entity breaks even is equal to its fixed costs divided by its contribution to profit per unit of output, which can be shown by the following formula:

$$\text{Breakeven Point} = \frac{\text{Fixed Costs}}{\text{Contribution per Unit Output}}$$

The break even point is also the point on a chat indicating the time when something has broken even, and is a general term for not having gained or lost something in a process.
The Contribution per Unit can be worked out using

Contribution = Price per Unit - Variable Costs per Unit

The **break even point** for a product is the point where total revenue received equals total costs associated with the sale of the product (TR=TC). A break even point is typically calculated in order for businesses to determine if it would be profitable to sell a proposed product, as opposed to attempting to modify an existing product instead so it can be made lucrative. Break-Even Analysis can also be used to analyze the potential profitability of an expenditure in a sales-based business.

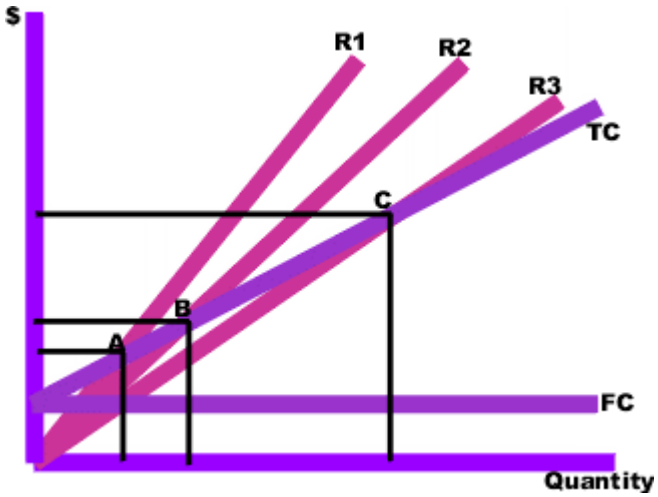
In unit sales
If the product can be sold in a larger quantity than occurs at the break even point, then the firm will make a profit; below this point, a loss. Break-even quantity is calculated by:
Total fixed costs / (price - average variable costs)

(Explanation - in the denominator, "price minus average variable cost" is the variable profit per unit, or contribution margin of each unit that is sold.)
Firms may still decide not to sell low-profit products, for example those not fitting well into their sales mix. Firms may also sell products that lose money - as a loss leader, to offer a complete line of products, etc. But if a product does not break even, or a potential product looks like it clearly will not sell better than the break even point, then the firm will not sell, or will stop selling, that product.

An example:

- Assume we are selling a product for $2 each.
- Assume that the variable cost associated with producing and selling the product is 60 cents.
- Assume that the fixed cost related to the product (the basic costs that are incurred in operating the business even if no product is produced) is $1000.
- In this example, the firm would have to sell (1000/ (2 - 0.6) = 714) 714 units to break even.

In price changes
By inserting different prices into the formula, you will obtain a number of break even points, one for each possible price charged. If the firm to change the selling price for its product, from $2 to $2.30, in the example above, then it would have to sell only (1000/(2.3 - 0.6))= 589 units to break even, rather than 714.



To make the results clearer, they can be graphed. To do this, you draw the total cost curve (TC in the diagram) which shows the total cost associated with each possible level of output, the fixed cost curve (FC) which shows the costs that do not vary with output level, and finally the various total revenue lines (R1, R2, and R3) which show the total amount of revenue received at each output level, given the price you will be charging.

The break even points (A,B,C) are the points of intersection between the total cost curve (TC) and a total revenue curve (R1, R2, or R3). The break even quantity at each selling price can be read off the horizontal, axis and the break even price at each selling price can be read off the vertical axis. The total cost, total revenue, and fixed cost curves can each be constructed with simple formula. For example, the total revenue curve is simply the product of selling price times quantity for each output quantity. The data used in these formulas come either from accounting records or from various estimation techniques such as regression analysis.

In potential expenditures Break-Even Analysis can be used in the evaluation of the cost-effectiveness of a new expenditure for a sales-revenue based business. Here, the cost can be evaluated in terms of revenues needed to break even on the investment, or more specifically, to determine how much of an increase in sales revenues would be necessary to break even.

An illustrative example of this is a retail lumberyard who is considering the purchase of a delivery truck. The goal is to evaluate how large an increase in sales revenue is necessary to break even on the investment in a delivery truck. For this example, the company's front-door margin (that is, sales revenue minus the cost of goods sold and costs of doing business) is 5%, and the cost of the desired delivery truck is $50,000. To calculate the break-even level of expenditure, the following formula can be used:

Expenditure ($) = (Front-door margin %) X (Revenue Increase needed to break even)

To break even using the above example, $50,000 must equal 5% of the sales INCREASE ("SI") in order to break even. The variable which must be isolated is the Sales Increase.

$50,000 = 5% of SI
$50,000 = .05 * SI
$50,000/.05 = SI
$1,000,000 = SI

Sales increase of $1,000,000 is needed to break even on the investment on the delivery truck. The business must then decide how it can use the delivery truck to help increase sales by $1,000,000; if it can, then they will break even, and if it can not, then it would be an ill-advised investment. If sales revenues pass the break-even point, 5% of further increase would be bottom line profit.

Of course, in most cases, such an investment will not be paid out in lump sum or in one year, so appropriate adjustments can be made for the payments, and the scenario can be focused on a monthly basis during repayment, or can be extended out through and beyond the repayment period to evaluate a longer term return. Also such calculations can be used with smaller-scale and shorter-term scenarios (such as a temporary employee or a new computer) or on a much larger scale such as a new construction or acquisition.

It is notable that, since most businesses have among their goals to be profitable, desired profits should be added as a cost of doing business.

Limitations

- This is only a supply side (i.e.: costs only) analysis.
- It tells you nothing about what sales are actually likely to be for the product at these various prices.
- It assumes that fixed costs (FC) are constant
- It assumes average variable costs are constant per unit of output, at least in the range of sales (both prices and likely quantities) of interest.

ECONOMIC BEAK-EVEN

The problem associated with accounting break even is that accounting earnings are calculated after the deduction of all costs except the opportunity cost of the capital that is invested in the project. Accounting for the cost of capital is simple, at least in principle, when working out income or profit, we should also deduct the opportunity cost of capital employed just as we deduct all other costs. Income that is worked out, as this (after deducting cost of capital) is known as economic profit or economic value added (EVA). A project that has a positive EVA adds to firm value; one with a negative EVA reduces firm value.

LESSON 13

OPERATING LEVERAGE & CAPITAL RATIONING

The following topics will be discussed in this lecture.

- Economic Break Even
- Degree of Operating Leverage
- Capital Rationing
- Hard Rationing
- Soft Rationing
- Single Period Rationing
- Multi period – linear programming with only two variables
- Limitation of Linear Programming / Criticism

ECONOMIC BREAK EVEN:

The difference between the accounting and economic break even is a cost factor known as opportunity cost of capital. In accounting break even we calculate the accounting earnings first and then deduct all the costs from earnings to reach at break even except the opportunity cost of capital that is invested in the project. According to Economic Value Added (EVA) concept, a firm creates value by earning returns of invested capital greater than its cost of capital. Basically, EVA is the economic profit a firm earns after all capital costs are deducted. More precisely stated, it is firm's net operating profit after tax less the cost of capital charge for the capital employed.

A firm can create value for its investors either by investing in new assets or it can return cash to investors who will invest this money for themselves by trading in the stock market. A firm that earns more than the cost of capital is better off since it is providing investors with better returns than they can earn for themselves on stand alone basis.

Economic break even suggests that when you deduct other cost from accounting earnings you should also deduct the cost of capital employed. A project having a positive EVA adds value to firm and a negative EVA reduces the firm's value.

DEGREE OF OPERATING LEVERAGE

A measurement of the degree to which a firm or project incurs a combination of fixed and variable costs.

1. A business that makes few sales, with each sale providing a very high gross margin, is said to be highly leveraged. A business that makes many sales, with each sale contributing a very slight margin, is said to be less leveraged. As the volume of sales in a business increases, each new sale contributes less to fixed costs and more to profitability.
2. A business that has a higher proportion of fixed costs and a lower proportion of variable costs is said to have used more operating leverage. Those businesses with lower fixed costs and higher variable costs are said to employ less operating leverage.

The higher the degree of operating leverage the greater the potential danger from forecasting risk. That is, if a relatively small error is made in forecasting sales, it can be magnified into large errors in cash flow projections. The opposite is true for businesses that are less leveraged. A business that sells millions of products a year, with each contributing slightly to paying for fixed costs, is not as dependent on each individual sale.

For example, convenience stores are significantly less leveraged than high-end car dealerships.

- **Capital Rationing**

Many companies specify an overall limit on the total budget for capital spending. There is no conceptual justification for such budget ceiling, because all projects that enhance long run profitability should be accepted.

The factors for putting limit:

- Net present values or IRR may strongly influence the overall budget amount
- Top management's philosophy toward capital spending.
- Same managers are highly growth minded whereas others are not.
- The outlook for future investment opportunities that may not be feasible if extensive current commitments are undertake.
- The funds provided by the current operations less dividends.

- The feasibility of acquiring additional capital through borrowing or sale of additional stock. Lead-time and costs of financial market transactions can influence spending.
- Period of impending change in management personnel, when the status quo is maintained.
- Management attitudes toward not.

Capital Rationing occurs when a company has more amounts of capital budgeting projects with positive net present values than it has money to invest in them. Therefore, some projects that should be accepted are excluded because financial capital is limited.
This is known as artificial constraint because the management may dictate the amount to be invested for project purposes.
It is also the artificial constraints because the amount is not based on the product marginal analysis in which the return for each proposal is related to the cost of capital and projects with net present values are accepted.
A company may adopt a posture of capital rationing because it is fearful of too much growth or hesitant to use external sources of financing.

Reasons for Capital Rationing:
There are basically two types of reasons of capital rationing.

- **External Reasons**
  These arise when a firm is unable to borrow from the outside. For example if the firm is under financial distress, tight credit conditions, firm has a new unproven product.
  Borrowing limits are imposed by banks particularly in relation to smaller firms and individuals.
- **Internal Reasons**
  Private owned company: Owners might decide that expansion is a trouble not worth taking. For example there may that management fear to lose their control in the company.
  - Divisional Constraints: Upper management allocates a fixed amount for each division as part of the overall corporate strategy. This arises from a point of view of a department, cost centre or wholly owned subsidiary, the budgetary constraints determined by senior management or head office.
  - Human Resource Limitations: Company does not have enough middle management to manage the new expansions
  - Dilution: For example, there may be a reluctance to issue further equity by management fearful of losing control of the company.
  - Debt Constraints: Earlier debt issues might prohibit the increase in the firm's debt beyond a certain level, as stipulated in previous debt contracts. For example bondholders requiring in the bond contract, that they would accept a maximum Debt-to-Asset ratio = 40%.

Capital Rationing could be said to signal a managerial failure to convince suppliers of funds of the value of the available projects. Although there may be something in this argument, in practice it is not a well-informed judgment. Furthermore, even if there were no limits on the total amounts of available finance, in reality the price may vary with the size as well as the term of the loan.

➢ **HARD CAPITAL RATIONING:**
This arises when constraints are externally determined. This will not occur under perfect market.

- If share prices are depressed or market is bearish, raising capital is very difficult.
- Restriction on lending by Banks.
- High interest rate
- High cost associated with issuance of share / debt instrument.

➢ **SOFT CAPITAL RATIONING:**
This arises with internal, management-imposed limits on investment expenditure. The factors leading to soft rationing are as under:

- Management is reluctant to issue new share because of the fear of outsider taking control of company.
- Dilution of EPS
- Increased interest payments in case of debt financing.
- Company's will to maintain limited investment level that can be financed thru retained earnings.

LESSON 14

SINGLE AND MULTI PERIOD CAPITAL RATIONING

Following topics will be discussed in this hand out:

- Single period capital rationing
- Multi-period capital rationing
- Linear programming

ONE-PERIOD CAPITAL RATIONING:

When limits are placed on the availability of finance for positive NPV projects for one year only and capital is freely available in all the rests of periods.

There are some additional assumptions in single period rationing which are very important to consider here:

i) If a firm does not undertake a project 'now' – the period of capital scarcity, the opportunity is lost. In other words, the project cannot be deferred until the capital is available.

ii) The outcome of each project is known with certainty so that the choice between the projects is not affected by considerations of risk.

iii) The projects are divisible – it means that we can undertake 50% of project A and 50% of project B.

The basic approach will be to rank the projects in such a way that NPV can be maximized from the use of available finances.

Ranking the projects using NPV will be incorrect in this scenario because NPV basis will lead to select the 'big' projects, each of which has a high individual NPV but which have a lower NPV than a large number of smaller projects with lower individual NPVs. Therefore, ranking should be made in terms of Profitability Index.

There are some issues with the PI method as well and should be outlined. This approach would only be feasible if projects are divisible. If projects are not divisible, which is normally the case in reality; a decision should be made by considering the absolute NPV of all possible combinations of all positive projects within the constraint of limited capital.

This method is of little use when project have different cash flow patterns.

PI method ignores the absolute size of individual projects. A project with a high index might be very small and therefore only generate a small NPV.

➢ MULTI-PERIOD CAPITAL RATIONING:

When capital is in limited availability in more than one period and selection of projects cannot be made by ranking projects according to PI, this situation is known as multi-period capital rationing.

Capital constraints are imposed in more than one period to restrict the acceptance of positive NPV projects.

Other techniques like linear programming tools can be used.

In mathematics, **linear programming** (LP) problems are optimization problems in which the objective function and the constraints are all linear.

Open problems

- Does LP admit a polynomial algorithm in the real number (unit cost) model of computation?
- Does LP admit a strongly polynomial algorithm?
- Does LP admit a strongly polynomial algorithm to find a strictly complementary solution?
- Does LP admit a (strongly or weakly) polynomial pivot algorithm (may be a non-simplex pivot algorithm, e.g., a criss-cross or arrangement method)?
- Is the polynomial diameter conjecture true for polyhedral graphs?
- Does LP admit a (strongly or weakly) polynomial simplex pivot algorithm?
- Is the linear diameter (Hirsch) conjecture true for polyhedral graphs?

Here we will discuss the graphical approach to LP. This involves only two variables and if there are more than two variables then simplex method is used.

When we are confronted with TWO projects (only) we can use graphical method to select the one best fit project.

First step is to define the variables or project by assigning them symbols like x & y, a & b etc.

The second step is the key issue where we establish the constraints like availability of capital in period 1, 2 and so on. For example, if we have two projects x and y and project x need 30 million of investment and

30x + 25y <= 40

Last step is to form an objective function. The objective function is to maximize the investment return. When we have translated the constraints and objective function in equation we plot these on a graph to work out the feasible solution.

LESSON 15

RISK AND RETURNS

The following topics will be discussed in this lecture.

- Risk and Uncertainty
- Measuring risk
- Variability of return – Historical Return
- Variance of return
- Standard Deviation

➢ RISK AND UNCERTAINTY:

If you buy an asset or any stock or share, the gains or losses you get on this investment are called return on investment. This return has normally two components. First, it is the income part that you may receive in terms of dividend (owning a share) and second part comes from the capital appreciation or increase in the market value of that share.

The above discussion suggests that the reward of return you get is the due to bearing the risk. Risk refers to the variability of returns. You may get dividend on a share – say 2% or 15%, or even you may not get anything from the issuing firm. Look at this simple example: the expected returns (income part only) can vary from 0 to 15%. This is called risk. However, you can use probabilities to determine your return. For instance, if the economy remains in boom, which has 60% chances, then our return will be 8%. So attaching probability we can to some extent, determine the return under risk conditions.

The other important thing to remember is that – greater the risk, larger the profit.

Uncertainty, refers to a situation where our ability to attach a probability to an outcome is ceased.

From hereafter, we shall discuss the ways and means to measure the risk.

➢ HISTORICAL RETURN ANALYSIS:

The problem with most financial planning is they accept a return rate on each of your investments and project your financial future on those rates. The argument is over a span of years your investments will return that rate "on average." Unfortunately this is an invalid and risky assumption. Investment rates vary from year to year. Sometimes they vary greatly. We cannot accurately predict the return rate on investments or the inflation rate. Consider the following simple example

You have $1000.00 invested and you expect a 10.0% average yearly return on your investment. In two years your investment will be worth $1210.00.

Now lets assume your same $1000.00 returns -10.00% the first year and +30.00% the second. Your investments after those two years are worth only $1170.00 even though your investment returned "on average" 10.0%.

The above example demonstrates the need for a mechanism to account for the volatility of investment return rates and the variability of inflation. The J&L Financial Planner has chosen to include two alternatives, a Monte Carlo Analysis and a Historical Return Analysis, as that mechanism.

J&L Financial Planner's Historical Return Analysis

The following paragraphs outline how the Historical Return Analysis is implemented by the J&L Financial Planner.

The J&L Financial Planner allows you to create simple or complex financial scenarios (financial plans) revolving around your existing accounts consisting of investment, retirement, asset, and equity accounts. The planner allows you to create and assign up to 10 asset allocation classes for each of your accounts. A simple example would have you create three asset allocation classes Stocks, Bonds, and Cash. You would assign each account the percentage of each of its allocation classes. A mutual fund account may consist of 70 percent Stocks and 30 percent Bonds, whereas a savings account would be 100 percent Cash. For each allocation class you assign a historical return data file representing the returns for that class over an historical time span. The planner comes with 6 example data files including 2 stock files, 2 bond files, 1 cash file, and an inflation file covering the years 1928 through 2003. The files are provided as examples and should be replaced with data files which meet your needs. You can create and edit up to 10 files, each corresponding to an asset allocation class.

The planner gives you two options with the Historical Return Analysis.

data. In the provided files this would generate a net worth (a line graph) starting with the returns from 1928. Next it would generate a net worth starting with the returns from 1929. It would do this for each year of your financial plan.
The second allows you to randomly select return data from the historical data files and use that data to calculate your net worth over the span of your financial plan. It also gives you the option of selecting the number of sequential years the program will use. In other words, if you select 10 years of sequential data, the program randomly selects the first year and then uses the data from the files for the following 9 years before randomly selecting another year. For example if you choose the number of sequential years as 1 and select 1000 trials it will randomly select return data from the historical data files for each year of your plan and execute your plan 1000 times. This has the effect of a Monte Carlo analysis with the random data being randomly selected from real historical return data.

Summary
In summary, the Historical Return Analysis is able to estimate the probability of achieving the success of your scenario by accounting for the yearly variability in the two main factors contributing to its outcome, the return rate on your investments and the inflation rate. You can execute up to a thousand trials of your scenario. Each trial is a fully independent execution of your financial plan, where each year the return rate on your investments and the inflation rate can take on a range of values based on historical asset class return data.
The large number of trials allows the analysis to compute the statistical probability your financial plan will be successful. For example, if after 1000 trials, 750 of those trials achieved your financial goals, your financial plan success rate is 75.0%.
If your financial plan success rate is below your expectations the J&L Financial Planner allows you to make easy scenario changes to play "what-if" with your financial future.

- **VARIANCE OF RETURN:**

The variance essentially measures the average squared difference between the actual returns and the average return. The bigger this number is, the more the actual returns tend to differ from the average return. Also, the larger the variance is the ore spread out the returns will be.
It is pertinent to note here that calculating variance and standard deviation will be different for historical and projected returns.
This is usually very close to the correlation squared. To understand what variance explained means, think of a manager and a Style Benchmark. Any variance in the difference between manager and Style Benchmark, i.e., any variance in the excess return of manager over benchmark, represents a failure of the Style Benchmark variance to explain the manager variance. Hence, the quotient of variance of excess return over variance of manager represents the unexplained variance. The variance explained is 1 minus the unexplained variance:
Variance Explained = 1 - Var (e) / Var (M)

Where:
Var (M) = variance of manager returns
Var (e) = variance of excess return of manager over benchmark

- **STANDARD DEVIATION:**

Were this set a sample drawn from a larger population of children, and the question at hand was the standard deviation of the population, convention would replace the N (or 4) here with N−1 (or 3).
The standard deviation σ of a probability distribution is defined as the square root of the variance σ^2,

$$\sigma = \sqrt{\langle x^2 \rangle - \langle x \rangle^2} \quad (1)$$

$$= \sqrt{\mu_2' - \mu^2}, \quad (2)$$

Where $\mu = \overline{x} = \langle x \rangle$ is the mean, $\mu_2' = \langle x^2 \rangle$ is the second raw moment, and $\langle f \rangle$ denotes an expectation value.
The variance σ^2 is therefore equal to the second central moment (i.e., moment about the mean),

$$\sigma^2 = \mu_2. \quad (3)$$

The square root of the sample variance of a set of N values is the sample standard deviation

$$s_N = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \overline{x})^2}\,. \tag{4}$$

The sample standard deviation distribution is a slightly complicated, though well-studied and well-understood, function.
However, consistent with widespread inconsistent and ambiguous terminology, the square root of the bias-corrected variance is sometimes also known as the standard deviation,

$$s_{N-1} = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \overline{x})^2}\,. \tag{5}$$

Physical scientists often use the term root-mean square as a synonym for standard deviation when they refer to the square root of the mean squared deviation of a quantity from a given baseline.
The standard deviation arises naturally in mathematical statistics through its definition in terms of the second central moment. However, a more natural but much less frequently encountered measure of average deviation from the mean that is used in descriptive statistics is the so-called mean deviation.
The variants value producing a confidence interval CI is often denoted x_{CI}, and

$$x_{CI} = \sqrt{2}\ \mathrm{erf}^{-1}(\mathrm{CI}). \tag{6}$$

The following table lists the confidence intervals corresponding to the first few multiples of the standard deviation.

Range	CI
σ	0.6826895
$2\,\sigma$	0.9544997
$3\,\sigma$	0.9973002
$4\,\sigma$	0.9999366
$5\,\sigma$	0.9999994

To find the standard deviation range corresponding to a given confidence interval, solve (5) for n, giving

$$n = \sqrt{2}\ \mathrm{erf}^{-1}(\mathrm{CI}). \tag{7}$$

CI	range
0.800	$\pm 1.28155\,\sigma$
0.900	$\pm 1.64485\,\sigma$
0.950	$\pm 1.95996\,\sigma$
0.990	$\pm 2.57583\,\sigma$
0.995	$\pm 2.80703\,\sigma$
0.999	$\pm 3.29053\,\sigma$

LESSON 16

PORTFOLIO & DIVERSIFICATION

The following topics will be discussed in this lecture.

- Portfolio and Diversification
- Portfolio and Variance
- Risk – Systematic & Unsystematic
- Beta – Measure of systematic risk
- Aggressive & defensive stocks

Modern Portfolio Theory (**MPT**) proposes how rational investors will use diversification to optimize their portfolios, and how an asset should be priced given its risk relative to the market as a whole. The basic concepts of the theory are Mark with diversification, the efficient frontier, capital asset pricing model and beta coefficient, the Capital Market Line and the Securities Market Line.

MPT models the return of an asset as a random variable and a portfolio as a weighted combination of assets; the return of a portfolio is thus also a random variable and consequently has an expected value and a variance. Risk in this model is identified with the standard deviation of portfolio return. Rationality is modeled by supposing that an investor choosing between several portfolios with identical expected returns will prefer that portfolio which minimizes risk.

Risk and Reward

The model assumes that investors are risk averse. This means that given two assets that offer the same return, investors will prefer the less risky one. Thus, an investor will take on increased risk only if compensated by higher expected returns. Conversely, an investor who wants higher returns must accept more risk. The exact trade-off will differ by investor. The implication is that a rational investor will not invest in a portfolio if a second portfolio exists with a more favorable risk-return profile - i.e. if for that level of risk an alternative portfolio exists which has better expected returns.

Mean and Variance

It is further assumed that investor's risk / reward preference can be described via a quadratic utility function. The effect of this assumption is that only the expected return and the volatility (i.e. mean return and standard deviation) matter to the investor. The investor is indifferent to other characteristics of the distribution of returns, such as its skew. Note that the theory uses a historical parameter, volatility, as a proxy for risk while return is an expectation on the future.

Under the model:

- Portfolio return is the component-weighted return (the mean) of the constituent assets. Return changes linearly with component weightings, w_i.
- Portfolio volatility is a function of the correlation of the component assets. The change in volatility is non-linear as the weighting of the component assets changes.

Diversification

An investor can reduce portfolio risk simply by holding instruments which are not perfectly correlated. In other words, investors can reduce their exposure to individual asset risk by holding a diversified portfolio of assets. Diversification will allow for the same portfolio return with reduced risk. For diversification to work the component assets must not be perfectly correlated, i.e. correlation coefficient not equal to 1.

Capital Allocation Line

The **Capital Allocation Line** (**CAL**) is the line that connects all portfolios that can be formed using a risky asset and a risk-less asset. It can be proven that it is a straight line and that it has the following equation.

$$CAL : E(r_C) = r_F + \sigma_C \frac{E(r_P) - r_F}{\sigma_P}$$

In this formula P is the risky portfolio, F is the risk-less portfolio and C is a combination of portfolios P and F.

The Efficient Frontier

Every possible asset combination can be plotted in risk-return space, and the collection of all such possible portfolios defines a region in this space. The line along the upper edge of this region is known as the efficient frontier (sometimes "the Mark witz"). Combinations along this line represent portfolios for which

Efficient Frontier is the intersection of the Set of Portfolios with Minimum Variance and the Set of Portfolios with Maximum Return.
The efficient frontier will be concave – this is because the risk-return characteristics of a portfolio change in a non-linear fashion as its component weightings are changed. (As described above, portfolio risk is a function of the correlation of the component assets, and thus changes in a non-linear fashion as the weighting of component assets changes.)
The region above the frontier is unachievable by holding risky assets alone. No portfolios can be constructed corresponding to the points in this region. Points below the frontier are suboptimal. A rational investor will hold a portfolio only on the frontier.

The Risk-Free Asset
The risk-free asset is the (hypothetical) asset which pays a risk-free rate - it is usually provied by an investment in short-dated Government bonds. The risk-free asset has zero variance in returns (hence is risk-free); it is also uncorrelated with any other asset (by definition: since its variance is zero). As a result, when it is combined with any other asset, or portfolio of assets, the change in return and also in risk is linear.
Because both risk and return change linearly as the risk-free asset is introduced into a portfolio, this combination will plot a straight line in risk return space. The line starts at 100% in cash and weight of the risky portfolio = 0 (i.e. intercepting the return axis at the risk-free rate) and goes through the portfolio in question where cash holding = 0 and portfolio weight = 1.

Portfolio Leverage
An investor can add leverage to the portfolio by holding the risk-free asset. The addition of the risk-free asset allows for a position in the region above the efficient frontier. Thus, by combining a risk-free asset with risky assets, it is possible to construct portfolios whose risk-return profiles are superior to those on the efficient frontier.

- An investor holding a portfolio of risky assets, with a holding in cash, has a positive risk-free weighting (a de-leveraged portfolio). The return and standard deviation will be lower than the portfolio alone, but since the efficient frontier is convex, this combination will sit above the efficient frontier – i.e. offering a higher return for the same risk as the point below it on the frontier.
- The investor who borrows money to fund his/her purchase of the risky assets has a negative risk-free weighting -i.e. a leveraged portfolio. Here the return is geared to the risky portfolio. This combination will again offer a return superior to those on the frontier.

The Market Portfolio
The efficient frontier is a collection of portfolios, each one optimal for a given amount of risk. A quantity known as the Sharp ratio represents a measure of the amount of additional return (above the risk-free rate) a portfolio provides compared to the risk it carries. The portfolio on the efficient frontier with the highest Sharpe Ratio is known as the market portfolio, or sometimes the super-efficient portfolio. This portfolio has the property that any combination of it and the risk-free asset will produce a return that is above the efficient frontier - offering a larger return for a given amount of risk than a portfolio of risky assets on the frontier would.

Capital Market Line
When the market portfolio is combined with the risk-free asset, the result is the Capital Market Line. All points along the CML have superior risk-return profiles to any portfolio on the efficient frontier. (A position with zero cash weighting is on the efficient frontier - the market portfolio.)
The CML is illustrated above, with return μ_p on the y axis, and risk σ_p on the x axis.
One can prove that the CML is the optimal CAL and that its equation is:

$$CML : E(r_C) = r_F + \sigma_C \frac{E(r_M) - r_F}{\sigma_M}$$

Asset Pricing
A rational investor would not invest in an asset which does not improve the risk-return characteristics of his

Systematic Risk and Specific Risk
Specific risk is the risk associated with individual assets - within a portfolio these risks can be reduced through diversification (specific risks "cancel out"). Systematic risk, or market risk, refers to the risk common to all securities - except for selling short as noted below, systematic risk cannot be diversified away (within one market). Within the market portfolio, asset specific risk will be diversified away to the extent possible. Systematic risk is therefore equated with the risk (standard deviation) of the market portfolio.
Since a security will be purchased only if it improves the risk / return characteristics of the market portfolio, the risk of a security will be the risk it adds to the market portfolio. In this context, the volatility of the asset, and its correlation with the market portfolio, is historically observed and is therefore a given (there are several approaches to asset pricing that attempt to price assets by modeling the stochastic properties of the moments of assets' returns - these are broadly referred to as conditional asset pricing models). The (maximum) price paid for any particular asset (and hence the return it will generate) should also be determined based on its relationship with the market portfolio.
Systematic risks within one market can be managed through a strategy of using both long and short positions within one portfolio, creating a "market neutral" portfolio.

Security Characteristic Line

The **Security Characteristic Line** (**SCL**) represents the relationship between the **market return** (r_M) and the return of a given asset i (r_i) at a given time t. In general, it is reasonable to assume that the SCL is a straight line and can be illustrated as a statistical equation:

$$SCL : r_{it} = \alpha_i + \beta_i r_{Mt} + \epsilon_{it}$$

where α_i is called the asset's alpha coefficient and β_i the asset's beta coefficient.

Capital asset pricing model
The asset return depends on the amount paid for the asset today. The price paid must ensure that the market portfolio's risk / return characteristics improve when the asset is added to it. The CAPM is a model which derives the theoretical required return (i.e. discount rate) for an asset in a market, given the risk-free rate available to investors and the risk of the market as a whole.
The CAPM is usually expressed:

$$\mathrm{E}(R_i) = R_f + \beta_i(\mathrm{E}(R_m) - R_f)$$

- β, Beta, is the measure of asset sensitivity to a movement in the overall market; Beta is usually found via regression on historical data. Betas exceeding one signify more than average "risk ness"; betas below one indicate lower than average.
- $(\mathrm{E}(R_m) - R_f)$ is the market premium, the historically observed excess return of the market over the risk-free rate'

Once the expected return, E(r_i), is calculated using CAPM, the future cash flows of the asset can be discounted to their present value using this rate to establish the correct price for the asset. (Here again, the theory accepts in its assumptions that a parameter based on past data can be combined with a future expectation.)
A more risky stock will have a higher beta and will be discounted at a higher rate; less sensitive stocks will have lower betas and be discounted at a lower rate. In theory, an asset is correctly priced when its observed price is the same as its value calculated using the CAPM derived discount rate. If the observed price is higher than the valuation, then the asset is overvalued; it is undervalued for a too low price.

Securities Market Line
The relationship between Beta & required return is plotted on the securities market line (SML) which shows expected return as a function of β. The intercept is the risk-free rate available for the market, while the slope is $(\mathrm{E}(R_m) - R_f)$. The Securities market line can be regarded as representing a single-factor model of the asset price, where Beta is exposure to changes in value of the Market. The equation of the SML is thus:

$$\mathrm{SML} : E(R_i) - R_f = \beta_i(E(R_M) - R_f)$$

Comparison with Arbitrage Pricing Theory

The SML and CAPM are often contrasted with the Arbitrage pricing theory (APT), which holds that the expected return of a financial asset can be modeled as a linear function of various macro-economic factors, where sensitivity to changes in each factor is represented by a factor specific bets coefficient.

The APT is less restrictive in its assumptions: it allows for an explanatory (as opposed to statistical) model of asset returns, and assumes that each investor will hold a unique portfolio with its own particular array of betas, as opposed to the identical "market portfolio". Unlike the CAPM, the APT, however, does not itself reveal the identity of its priced factors - the number and nature of these factors is likely to change over time and between economies.

LESSON 17

SECURITIES MARKET LINE & CAPITAL ASSET PRICING MODEL – CAPM

The following topics will be discussed in this lecture.

- Security Market Line
- Capital Asset Pricing Model – CAPM
- Calculating Over/Under valued stocks

SECURITIES MARKET LINE:

The security market line tells us how risk is rewarded in the market. Let's assume that expected return (Er) on any asset is Erm is 18% and beta of 1.5 and risk free rate (Rf) is 8%. Please note a risk free asset has a beta of zero because it has no systematic risk.

Going forward, we create a portfolio comprising of an Asset A and risk free asset. We calculate expected return on portfolio by changing the investment level in both assets. For example, if 30% of the investment is made in asset A, the expected return will be

E(r) = %a x E(r) A + %b x Rf
E(r) = 30% x 18% + (1 - 0.30) x 8%
= 5.40 + 6 = 11.40%
And the beta of this portfolio can be computed as:
Bp = 30% x Ba + 70% x Bb

Bp = 0.30 x 1.50 + 70% x 0 (since risk-free asset has zero beta)
Bp = 0.45 + 0 = 0.45

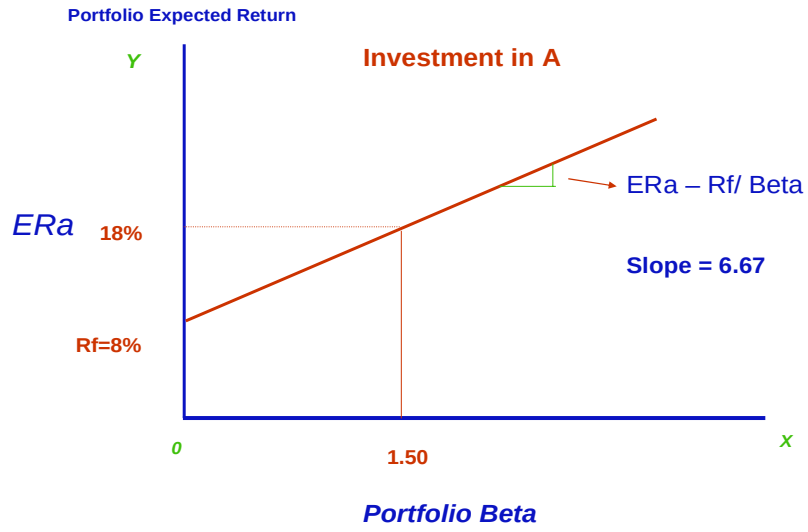
Now you can think that can we increase our investment in stock A beyond 100% level. This can be done by if the investor borrows at risk free rate. Assuming that investment in stock A is increased to 150% and this would imply that investment in risk free asset has been reduced by 50% in order to keep investment at 100% level.

The expected return on this portfolio will be:
Er (p) = 1.50 x 18% + -0.50 x 8%
= 27 % - 4% = 23%

The portfolio beta will be:

B (p) = 1.5 x 150% + (100 -150) x 0
= 2.25 + 0 = 2.25

Now we can work out different investment possibilities by changing the portion of amount invested in asset A. Also, we plot these values to draw a graph.



% OF PORTFOLIO INVESTMENT IN STOCK A	PORTFOLIO ER	PORTFOLIO BETA	CURVE SLOPE
			8
0	8.00	-	-
25	10.50	0.3750	6.67
50	13.00	0.7500	6.67
75	15.50	1.1250	6.67
100	18.00	1.5000	6.67
125	20.50	1.8750	6.67
150	23.00	2.2500	6.67

Reward to Risk = (ER a - ER rf) / BETA a
= 0.0666667 or 6.67
The graph and table tell us something clearly that slop of the curve returns a constant value at all investment levels. The slop of curve is just the risk premium on assets A divided by Asset A's beta Ba.

Slope of curve = Era – Rf / Ba (18 – 8)/1.5 = 6.667
The fourth column in the table uses this formula to calculate the slop.

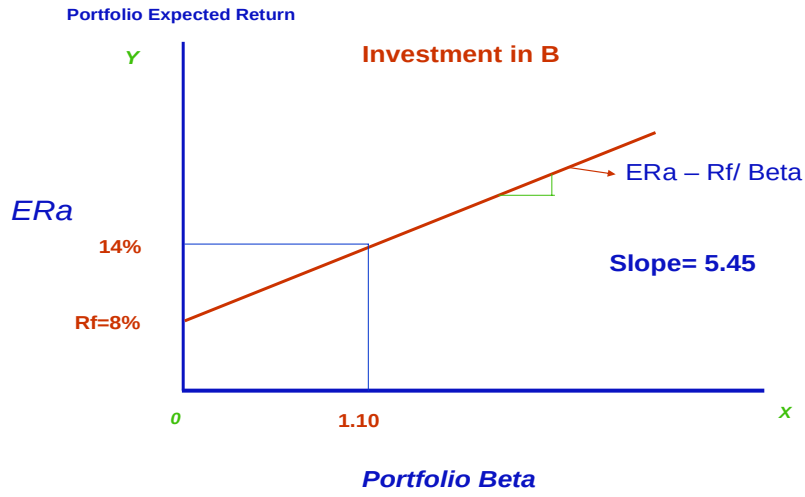
Now we advance our example and consider another asset B, offering expected return of 14% and a beta of 1.10. The Rf is the same i.e., 8%.

Assuming that we invest 30% in asset B and rest in risk free asset. Then portfolio return can be calculated the way we did above.

That is
Erp = .30 x 14% + (1 - .30) x 8%
= 4.2 + 5.6 = 9.80%

Bp = .30 x 1.10 + .70 x 0
= 0.33

Like asset A, we can work out different investment combination and a graph as under:



% OF PORTFOLIO INVESTMENT IN STOCK A	PORTFOLIO ER	PORTFOLIO BETA	CURVE SLOPE
			8
0	8.00	-	-
25	9.50	0.28	5.45
50	11.00	0.55	5.45
75	12.50	0.83	5.45
100	14.00	1.10	5.45
125	15.50	1.38	5.45
150	17.00	1.65	5.45

Reward to Risk = (ER a - ER rf) / BETA a
= 5.45

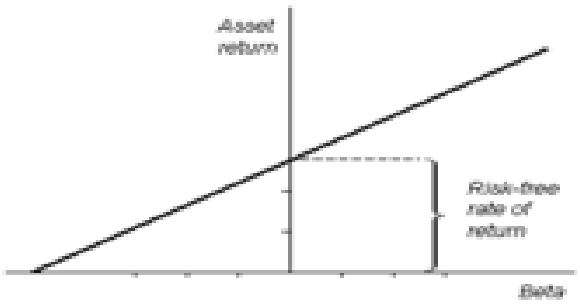
The risk to reward ratio of 5.45% is returned by the stock B and is less than the return offered by stock A. It is clear from the example that stock A is offering more returns than stock B. In a well organized market this situation will not persist for a long period of time. This is because more investors will invest in stock A and at the same time investment in stock B will reduce. This situation will push up the price of stock A resulting in reduction in returns of this stock. The prices of stock B will reduce thereby increase the returns. This situation will continue till the point when the prices of both assets are same. Thus in an efficient market the slope of both assets will be the same.

Era – Rf/Ba = Erb – Rf/Bb

Moving towards the conclusions that regardless of number of assets available in the market, **the reward to risk ratio must the same for all the stocks available in the market.**

The relationship between Beta & required return is plotted on the *securities market line* (SML) which shows expected return as a function of β. The intercept is the risk-free rate available for the market, while the slope is $(\mathrm{E}(R_m) - R_f)$. The Securities market line can be regarded as representing a single-factor model of the asset price, where Beta is exposure to changes in value of the Market. The equation of the SML is thus:

$$\mathrm{SML} : E(R_i) - R_f = \beta_i(E(R_M) - R_f)$$



The Security Market Line

➢ **CAPITAL ASSET PRICING MODEL:**

The asset return depends on the amount paid for the asset today. The price paid must ensure that the market portfolio's risk / return characteristics improve when the asset is added to it. The CAPM is a model which derives the theoretical required return (i.e. discount rate) for an asset in a market, given the risk-free rate available to investors and the risk of the market as a whole.

The CAPM is usually expressed:

$$\mathrm{E}(R_i) = R_f + \beta_i(\mathrm{E}(R_m) - R_f)$$

- β, Beta, is the measure of asset sensitivity to a movement in the overall market; Beta is usually found via regression on historical data. Betas exceeding one signify more than average "riskiness"; betas below one indicate lower than average.
- $(\mathrm{E}(R_m) - R_f)$ is the market premium, the historically observed excess return of the market over the risk-free rate.

Once the expected return, *E*(*ri*), is calculated using CAPM, the future cash flows of the asset can be discounted to their present value using this rate to establish the correct price for the asset. (*Here again, the theory accepts in its assumptions that a parameter based on past data can be combined with a future expectation.*)

A more risky stock will have a higher beta and will be discounted at a higher rate; less sensitive stocks will have lower betas and be discounted at a lower rate. In theory, an asset is correctly priced when its observed price is the same as its value calculated using the CAPM derived discount rate. If the observed price is higher than the valuation, then the asset is overvalued; it is undervalued for a too low price. Summarizing this discussion we can say that CAPM tell us:

- Time value of money: risk free rate "Rf" is a rate when you don't take risk. it is just waiting for money.
- Reward for risk: the equation "Erm – Rf" represents reward for taking average systematic risk in addition to waiting.
- Systematic risk: is measured by beta. This measure the systematic risk present in an assets or portfolio, relative to average asset.

➢ **Calculating Over/Under Valued Stocks**

An asset is said to be overvalued if its price is much higher given its expected return and risk. On the other hand, an asset is said to be undervalued if its price is much lower given its Er and risk.

STOCK	ER	BETA	Risk to Reward Ratio
ABC	15	1.5	5.33
XYZ	11	0.9	4.44
Risk Free Rate	7		
SLOPE OF SML:			
ERa – Rf/ Beta			
ABC	5.33		
XYZ	4.44		

Consider the above example where we have two assets and their expected return and beta is given. We also calculate the risk-to-reward ratio assuming the risk free rate of 7%.

We can conclude that XYZ offers an insufficient expected return given its level of risk relative to ABC. This is because former's expected returns are very low and its price is high. Therefore, XYZ is overvalued relative to ABC. In efficient market the price of this stock will fall. On the same we can say that ABC is undervalued stock and its price will rise.

LESSON 18

COST OF CAPITAL & CAPITAL STRUCTURE

The following topics will be discussed in this lecture.

- Cost of Capital & Capital Structure
- Components of Capital
- Cost of Equity
- Estimating g or growth rate
- Dividend growth model
- Cost of Debt / Bonds
- Cost of Preferred Stocks

COST OF CAPITAL

The required return is necessary to make a capital budgeting project such as building a new factory worthwhile. Cost of capital would include the cost of debt and the cost of equity.
The cost of capital determines how a company can raise money (through a stock issue, borrowing, or a mix of the two). This is the rate of return that a firm would receive if it invested its money someplace else with similar risk.

CAPITAL STRUCTURE

Capital structure of a typical company may consist of ordinary shares, preference stock, short term and long term loan, bonds and leases. These components in capital structure have their own cost and if we add all the individual components cost after adjusting with the weight age of each, the resultant value is known as weighted cost of capital. As you have already covered in your earlier lessons that normally we use WACC as discount rate to find the present value of future cash flows emerging from a project, so it is of immense importance to calculate the correct WACC. And you are also aware that if the WACC is incorrect it may lead to serious consequences.
In order to compute the WACC we need to calculate the individual components cost. First of all we take up the Equity part of the capital and will see how we can compute the cost of equity.

COST OF EQUITY

In financial theory, the return that stockholders require for a company is called cost of equity. The traditional formula is the dividend capitalization model:

$$\text{Cost of Equity} = \frac{\text{Dividends per Share (for next year)}}{\text{Current Market Value of Stock}} + \text{Growth Rate of Dividends}$$

A firm's cost of equity represents the compensation that the market demands in exchange for owning the asset and bearing the risk of ownership.
Let's look at a very simple example: let's say you require a rate of return of 10% on an investment in stock A. The stock is currently trading at $10 and will pay a dividend of $0.30. Through a combination of dividends and share appreciation you require a $1.00 return on your $10.00 investment. Therefore the stock will have to appreciate by $0.70, which, combined with the $0.30 from dividends, gives you your 10% cost of equity.

We shall discuss two methods we can use to determine the cost of equity.
First, we'll take up dividend growth models and then security market line approach to calculate the cost of equity.
Assuming that dividends will grow at a constant rate in future (growth rate =g), price per share Po (current price) can be found by the following formula:
Po = Do x (1 + g) / Re – g
Or
Po = D1 / Re – g

Where D1 is the dividend after period 1 and Re represents return on equity.
We can re-arrange this equation in order to calculate the Re as under:

Re = D1 / Po + g

This equation tells us that we need three variables to work out the cost of equity. These are current price Po, dividend in period 0, and Do and growth rate.

Most complex variable in the above equation is to determine the "g" variable. You can obtain the Po and Do very easily from internal or external sources. We can use some statistical techniques to forecast g using the historical data. More precisely using trend and regression analysis we can obtain the value of g.

The primary advantage of dividend growth model is that it is very simple to understand and use. However, there are some problems also associated with this approach.

It is only applicable to the firms which pay dividend regularly if not constantly. Therefore, a firm with no dividend history will find it useless.
The other problem is an unrealistic assumption of constant growth of dividends. We may not find any such company which has a history of constant growth in dividends. These two limitations make this model to be used in selected scenarios, for example, where the company may have distributed the dividends consistently in the past.

The other problem is that the estimated cost of equity is very sensitive to the estimated growth rate.

Finally, this approach does not take into account the risk level. There is no direct adjustment for the risky-ness of the investment. For instance, there is no adjustment for the degree of certainty or uncertainty in estimated growth rate for dividends

The other way to compute the cost of equity is SML (security market line) which tells us that the required rate of return on a risky investment depends on three things.

i) The risk free rate, Rf
ii) Market risk premium, (Erm – Rf)
iii) Systematic risk of the asset known as beta, B

Using SML we can write the equation as under:
Ere = Rf + Be x (Erm – Rf)
Where
Ere = is expected return on equity.
Be = is Beta of equity.

This method is also suffering from advantages and disadvantages. First it explicitly adjusts the risk and second, it is applicable to companies other than just those with steady dividend growth. Thus it may be useful in wider circumstances.

The SML approach heavily relies on two things – the market risk premium and beta coefficient. And if our estimates are not very accurate then the cost of equity number will be incorrect and misleading as well.

The demerit of both dividend model and SML is that both consider past data to predict the future. Economic conditions and indicator in future are not the same as were in past. However, both methods do provide us relative guidance in computing the cost of equity.

Before we move ahead to cost of debt, let's take a look how we can raise capital in the long run. From a firm's perspective, followings are the ways to build the capital:

- venture capital
- issuing share to public – IPOS
- subsequent issue of share – right issue
- private placement of shares

- bank loans
- debt instruments
- leases

There are some rules and regulations for raising capital for each of the above categories. We shall discuss here some of the issues relating to Equity capital – issuing shares through IPOs and subsequent issue of shares like right issue.

- company must be listed on stock exchange
- must be registered with security & exchange commission of Pakistan – SECP
- company issues prospectus
- underwriting the share issue
  - Underwriter refers to a firm that acts as intermediary between a company issuing shares and the public.
  - underwriter normally perform following services
    - devising method for issuing shares
    - setting the price of new shares
    - marketing / selling of securities
  - Underwriters may buy securities for less than the price set by the company and then selling them to public. if any amount of shares not subscribed by the public then underwriter takes up the under-subscribed shares.
  - Often underwriter forms a group to share the risk, known as syndicate.

COST OF DEBT:

Debt component of capital may include several line items like preferred stocks, loans from various financial institutions with varying terms and cost. Some of the loans may be having fixed or floating interest rate. The other items in the debt are bonds and leases.

The effective rate that a company pays on its current debt can be measured in either before- or after-tax returns; however, because interest expense is deductible, the after-tax cost is seen most often. This is one part of the company's capital structure, which also includes the cost of equity.
A company will use various bonds, loans and other forms of debt, so this measure is useful for giving an idea as to the overall rate being paid by the company to use debt financing. The measure can also give investors an idea as to the risky-ness of the company compared to others, because riskier companies generally have a higher cost of debt.
To get the after-tax rate, you simply multiply the before-tax rate by one minus the marginal tax rate (before-tax rate x (1-marginal tax)). If a company's only debt were a single bond in which it paid 5%, the before-tax cost of debt would simply be 5%. If, however, the company's marginal tax rate were 40%, the company's after-tax cost of debt would be only 3% (5% x (1-40%)).

Like loans, bonds may have several issues of varying terms, carrying different interest cost with wide gap between their cost and market value. Leases may have the same characteristics like loans and debts.

To find the cost of debt, we need to calculate the cost of each class of debt and then finding the weighted average of the cost of debt. For example, if there are five bond issues outstanding at any time, we will calculate the cost of each issue and then move to weighted average of cost of bond by using their individual weight in total bond capital.

COST OF PREFERRED STOCK:
To start computing the cost of debt, we take up the first item in debt family – preferred stock, which is fairly straightforward calculation.
As we know that preferred stocks carry fixed dividend every period. There's no variation in dividend level. This means that dividend from preferred stock is essentially perpetuity.

- cost of preferred stock can be calculated from the following
- $R = D / Po$

- for example if the dividend is R 3.50/- per share and current market price is rs.40/-, then the Rp will be:
- Rp = 3.50 / 40 = 8.75%

We shall take up the two main issues for calculating cost of debt for loans and leases in other hand outs to be delivered in future.

LESSON 19

COST OF DEBT & WEIGHTED AVERAGE COST OF CAPITAL (WACC)

The following topics will be discussed in this lecture.

- Venture Capital
- Cost of Debt & Bond
- Weighted average cost of debt
- Tax and cost of debt
- Cost of Loans & Leases
- Overall cost of capital – WACC
- WACC & Capital Budgeting

Venture Capital

Venture capital is capital typically provided by outside investors for financing of new, growing or struggling businesses. Venture capital investments generally are high risk investments but offer the potential for above average returns. A venture capitalist (VC) is a person who makes such investments. A venture capital fund is a pooled investment vehicle (often a partnership) that primarily invests the financial capital of third-party investors in enterprises that are too risky for the standard capital markets or bank loans.

Alternatives to Venture Capital

Because of the strict requirements venture capitalists have for potential investments, many entrepreneurs seek initial funding from angel investors, who may be more willing to invest in highly speculative opportunities, or may have a prior relationship with the entrepreneur.

Furthermore, many venture capital firms will only seriously evaluate an investment in a start-up otherwise unknown to them if the company can prove at least some of its claims about the technology and/or market potential for its product or services. To achieve this, or even just to avoid the dilutive effects of receiving funding before such claims are proven, many start-ups seek to self-finance until they reach a point where they can credibly approach outside capital providers such as VCs or angels. This practice is called "bootstrapping".

In industries where assets can be scrutinized effectively because they reliably generate future revenue streams or have a good potential for resale in case of foreclosure, businesses may more cheaply be able to raise debt to finance their growth. Good examples would include asset-intensive extractive industries such as mining, or manufacturing industries. The following factors should be considered before making decision to raise capital through venture:

- limited market and access of VC
- introduction market – it works on personal contacts
- very expensive option
- Stake in management make it risky for original owners.
- No physical collateral is required.
- Venture capitalist must be financially strong.
- previous track record or success rate
- Style of venture capitalist – in addition to money skill set will definitely add value.
- Contacts of VC are very important.
- Exit strategy must be finalized.

Cost of Debt – Bonds

A company may have several bond issues outstanding. From debt family we need to calculate first the cost of each class of debt and then we will calculate the cost of debt by taking into account cost of each component using their weight age from total debt. Consider the following example:

						Weighted Average	
Bond ISSUE	**Book Value**	**% of BV**	**MV of Bonds**	**% of MV**	**YTM**	**BV**	**MV**
D	500.00	0.33	501.50	0.35	6.24	2.09	2.18

F	496.00	0.33	440.50	0.31	8.36	2.78	2.56
R	200.00	0.13	206.90	0.14	7.31	0.98	1.05
T	297.00	0.20	287.40	0.20	7.90	1.57	1.58
	1,493.00		1,436.30			**7.42**	**7.37**

A company has four outstanding bond issues having different yield to maturity and market value. We have both book values and market values in the above table but using market values are preferred for computing weighted average of cost of bond interest because the market value reflect the current risk level in prices, Total BV of bond debt is 1493 million and third column from left hosts the % portion of each issue from the total bond debt. In fourth and 5th columns we have market values of bonds and weight of each issue from total market value.
In the last two columns we have cost of each issue by multiplying YTM with BV and MV. The weighted average cost of bond debt is 7.37% using market values.
Like the way we calculated the bond single rate as cost of debt, the cost of loan with a difference that normally we take the book values of debt in computing the single loan rate.
It will be pertinent to note here that the interest paid on loans, bonds and leases are tax deductible whereas the dividend paid to preference shareholders is NOT tax deductible. When we are calculating the single cost rate of debt family we must take into account the tax deductibility of loans, bonds and leases.

After-tax Cost of Debt

After-tax cost of debt = Interest rate x (1 - tax rate)
EXAMPLE:

0.08 = 10% x (1 - 0.2)

This explains how we work out the after tax cost of debt.

Weighted Average Cost of Capital

Once we have calculated the individual component cost then we move ahead to compute the overall weighted average cost of capital. The process is to find the weight of each component from overall capitalization and then multiply it by the interest cost of each component. Adding all the resulting numbers give us the WACC.

A calculation of a firm's cost of capital in which each category of capital is proportionately weighted. All capital sources - common stock, preferred stock, bonds and any other long-term debt - are included in a WACC calculation.

WACC is calculated by multiplying the cost of each capital component by its proportional weight and then summing:

$$WACC = \frac{E}{V} * Re + \frac{D}{V} * Rd * (1 - Tc)$$

Where:
Re = cost of equity
Rd = cost of debt
E = market value of the firm's equity
D = market value of the firm's debt
V = E + D
E/V = percentage of financing that is equity

D/V = percentage of financing that is debt
Tc = corporate tax rate

Broadly speaking, a company's assets are financed by either debt or equity. WACC is the average of the costs of these sources of financing, each of which is weighted by its respective use in the given situation. By taking a weighted average, we can see how much interest the company has to pay for every dollar it finances.
A firm's WACC is the overall required return on the firm as a whole and, as such, it is often used internally by company directors to determine the economic feasibility of expansionary opportunities and mergers. It is the appropriate discount rate to use for cash flows with risk that is similar to that of the overall firm.

Capital Budgeting
A firm's WACC is the overall required return on the firm as a whole and, as such, it is often used internally by company directors to determine the economic feasibility of expansionary opportunities and mergers. It is the appropriate discount rate to use for cash flows with risk that is similar to that of the overall firm.

Popular methods of capital budgeting include net present value (NPV), internal rate of return (IRR), discounted cash flow (DCF) and discounted payback period. The discount rate used to find out the PV of future cash flow is normally the WACC.

In capital budgeting context it should be remember that WACC will only be appropriate discount rate if the proposed project has the same risk level. If the risk levels of proposed and existing projects are different then it would be misleading to use WACC as discount rate.

Consider the following example that will aid in understanding the use of WACC in capital budgeting decisions.

- Example: a company intends to undertake a project that will yield after tax saving of Rs. 4 million at the end of year one. However, after that these savings are estimated to grow at 6 percent. The debt equity ratio of 0.5. Cost of equity is 25% and cost of debt is 11%. This project has the same level of risk as the existing company business. Advise company on the financial viability of project. Assume tax rate of 40 percent.

- WACC = 2/3*25 + 1/3 * 11(1-40) = 18.86
- PV = benefit / WACC - g
- PV = 4,000,000 / .1886 – 0.06 = 31,104,199/-

Since the NPV is positive the project can be undertake.

LESSON 20

CAPITAL STRUCTURE AND FINANCIAL LEVERAGE

In this hand out we shall cover the following topics:

- ✓ **When to use WACC?**
- ✓ **Pure Play**
- ✓ **Capital Structure and Financial Leverage**

WHEN TO USE WACC:

As we have covered in our lecture that using WACC as discount rate for discounting the cash flow of intended project, is only feasible if the proposed project fall within the firms existing activities circle. For example if a Oil manufacturing concern plans to establish another production facility then the existing WACC of the firm can be used as discount rate. However, if the same firm is thinking to set up a new spinning unit, then using existing WACC would be fatal and inappropriate.

WACC of a company reflects the level of risk and WACC is only appropriate discount rate if the intended investment is replica of company's existing activities – having same level of risk.
Using WACC as discount rate when the intended project has different risk level as of company then it will lead to incorrect rejections and/or incorrect acceptance.
For example, a company having two strategic units and one unit having lower risk than the other, using WACC to allocate resource will end up putting lower funds to high risk and larger funds to low risk division.
The other side of this issue emerges from the situation when a firm is having more than one line of business. For example a firm has two divisions: one of these has relatively low risk and the other has high risk.
In this case, the firm's overall WACC would be the sum of two different costs of capital, which is one for each business division. If two of these are contenders for the resources, the riskier division would tend to have greater returns so it would be having the major chunk. The other one might have huge profit potential ends up with insufficient resources allocated.

Pure Play

Using WACC blindly can lead to severe problems for a firm. Because we cannot observe the returns of these investment, there generally is no direct way of coming up with the beta. The approach must be to find a project or another firm in the industry in which our proposed project falls. We can use the beta of that firm along with the D/E ration prevalent in that industry.
Once we have the beta and D/E of the firm or industry that resembles to our project we can estimate the exact beta and D/E of proposed project. For example, if the industry (in which our intended project will fall) has a beta of 1.7 and D/E ratio of 40:60, and we intend to finance the new project through equity only, we can calculate the exact beta of intended project which, in turn will be used to calculate the new project WACC or discount rate to evaluate the project cash flow. This process may involve un-gearing and re-gearing.

Formula to un-gear equity Beta $= \dfrac{\text{Gbeta}}{\text{E} / \text{E} + \text{D}(1-\text{t})}$

Gbeta = Geared beta (1.7 in our example)
E = Weight of equity in capital structure
D = Weight of debt in capital structure
T = Tax rate

In this example we need to un-gear the beta. Why? Note that the beta of the industry in which the proposed project falls has D/E ratio of 40:60 but the new project shall be all equity financed. We un-gear the beta – that means the financial risk element needs to be removed from the geared beta of 1.7.

If we plug in values in the above equation we get the value of un-geared beta of 1.3296, which is also

Pure play refers to what has been described above. We need to gauge the systematic risk of the new project in order to calculate the beta and WACC to be used for discounting cash flow.

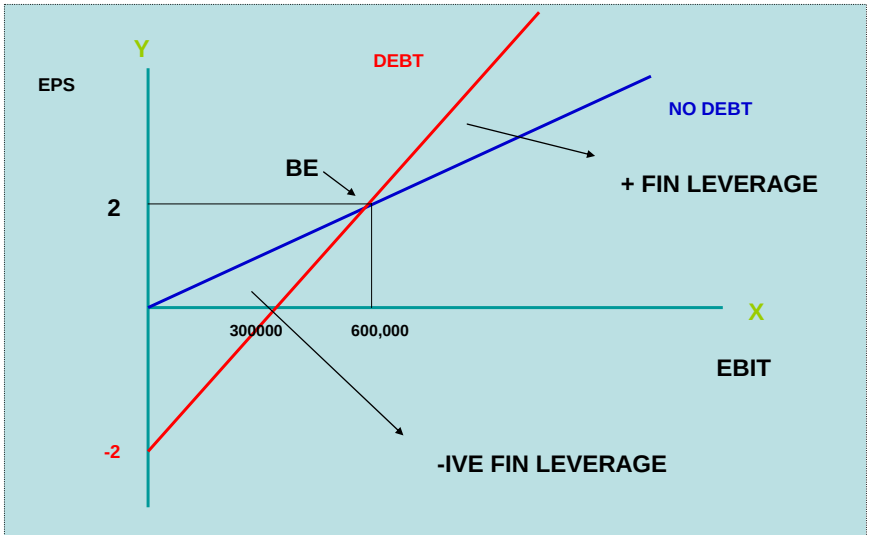
Capital Structure & Financial Leverage:
FOR the most part, a firm may choose any capital structure. Capital structure refers to the combination of financing through equity and loans or debt. If management might decided to issue new shares and pay off bond debt in order to reduce the debt-equity ratio. Activities like this are known as capital restructuring. This is in fact a change of investment source leaving the firm's assets unchanged.
In the last 4/5 lectures we discussed the concept of WACC. It is simply the firm's overall cost of capital and comprised of weighted average of the costs of various components of firm's capital structure. Now the question arises that what happens to cost of capital when we change the relative weights of debt or equity?

The value of firm is maximized when WACC is at its lowest level. As you know that WACC is the discount rate appropriate to evaluate the cash flow, the lower the discount rate the higher the present value of cash flow. In other words, present value and discount rate move in opposite direction, lower WACC will ensure maximizing the cash flow of the firm.
Thus, a firm must choose the capital structure so that the WACC is minimized. A capital structure that minimizes the WACC would be better than the other one which with higher WACC.

Financial Leverage
The amount of debt in capital structure of a firm is known as financial leverage. In other words, how a firm utilizes the amount of debt. The more debt in capital structure, there is greater financial leverage.

Financial leverage magnifies the payoffs to shareholders. It means that it increases the profit and loss with more percentage than a percentage change in sales. It may be possible that financial leverage does not affect the cost of capital. It is true then firm capital structure becomes irrelevant.
For example, a firm is all equity financed. Total assets are Rs. 6.0 million which are finance by 200,000 shares of Rs. 20 each. It is assumed that EBIT (Earning before Interest & Tax) is Rs. 800,000 in first year and Rs. 1.20 million in second year. In this case, EPS (Earning per share) will be Rs. 2.67 & Rs.4 per share respectively in first and second year. The ROE (Return on Equity) is 13.33% and 20% respectively for year 1 & 2.
Now consider that the firm decides to employ debt in it capital structure. The asset side will remain constant at Rs. 6.0 million. In the proposed restructuring the D/E ratio of 1 is applied. It means that Rs. 3 million will be invested from equity and Rs. 3 million of debt is employed. Interest rate is assumed at 10%. Assuming the same level of EBIT in both years, the EPS is now Rs. 3.33 and Rs.6 and ROE has jumped to 16.67% and 30% in first and second year respectively.

This magic is played by the financial leverage. It has increased both EPS AND ROE after debt was mixed up in the capital structure.



Financial leverage can also increase the losses as well. Looking at the graph above, if the EBIT is not enough then it magnifies the losses. At EBIT of Rs. 600,000 the EPS is Rs. 2/-. If the EBIT is less than point BE it represents the negative impact of debt. If the EBIT is falling right to the BE point it increase the return, the positive financial leverage.

LESSON 21

CAPITAL STRUCTURE & COST OF EQUITY
MODIGLIANI AND MILLER MODEL

The following topics will be discussed in this lecture.

- Home made leverage
- Modigliani & Miller Model
- How WACC remains constant?
- Business & Financial Risk
- M & M model with taxes

1. Home made leverage

An investor can change the overall financial leverage to which he is exposed, by the use of personal borrowing and investing it.
A substitution of risks that investors may undergo in order to move from overpriced shares in highly levered firms to those in un-levered firms by borrowing in personal accounts.
Mainly attributed to the Modigliani-Miller Theorem, homemade leverage describes the situation where individuals borrowing on the exact same terms as large firms can duplicate corporate leverage through purchasing and financing options.

2. Modigliani & Miller Model

A financial theory stating that the market value of a firm is determined by its earning power and the risk of its underlying assets, and is independent of the way it chooses to finance its investments or distribute dividends. Remember, a firm can choose between three methods of financing: issuing shares, borrowing and spending profits (as opposed to dispersing them to shareholders in dividends). The theorem gets much more complicated, but the basic idea is that, under certain assumptions, it makes no difference whether a firm finances itself with debt or equity.
Notes:
In "Financial Innovations and Market Volatility" Merton Miller explains the concept using the following analogy:
"Think of the firm as a gigantic tub of whole milk. The farmer can sell the whole milk as is. Or he can separate out the cream and sell it at a considerably higher price than the whole milk would bring. (That's the analog of a firm selling low-yield and hence high-priced debt securities.) But, of course, what the farmer would have left would be skim milk with low butterfat content and that would sell for much less than whole milk. That corresponds to the levered equity. The M and M proposition says that if there were no costs of separation (and, of course, no government dairy-support programs), the cream plus the skim milk would bring the same price as the whole milk."
Modigliani-Miller theorem

The **Modigliani-Miller theorem** forms the basis for modern thinking on capital structure. The basic theorem states that, in the absence of taxes, bankruptcy costs, and asymmetric information and in an efficient market, the value of a firm is unaffected by how that firm is financed. It does not matter if the firm's capital is raised by issuing stock or selling debt. It does not matter what the firm's dividend policy is.

3. How WACC remains constant?

A calculation of a firm's cost of capital in which each category of capital is proportionately weighted. All capital sources - common stock, preferred stock, bonds and any other long-term debt - are included in a WACC calculation.

WACC is calculated by multiplying the cost of each capital component by its proportional weight and then summing:

$$WACC = \frac{E}{V} * Re + \frac{D}{V} * Rd * (1 - Tr)$$

Where:

Re = cost of equity
Rd = cost of debt
E = market value of the firm's equity
D = market value of the firm's debt
V = E + D
E/V = percentage of financing that is equity
D/V = percentage of financing that is debt
Tc - = corporate tax rate

The weight age average cost of capital will be constant if the proportionate of weight age of all sources remains constant i.e. common stock, preferred stock, bonds and any other long term debt. And also the return on common & preferred stock and interest on debt remains constant, then WACC remains constant. When we talk about WACC remains constant we actually mean that any combination of debt & equity from 100% will not alter the overall cost of capital. That means that if you slice bread into four pieces and then each piece into two to make total of eight pieces. Now you have more pieces but not more bread.

CURRENT STATUS		**CAPITAL STRUCTURE COMBINATIONS**			
	Rs.	Rs.	Rs.	Rs.	Rs.
ASSETS	6,000,000.00	6,000,000.00	6,000,000.00	6,000,000.00	6,000,000.00
DEBT	-	2,000,000.00	3,000,000.00	4,000,000.00	5,000,000.00
EQUITY	6,000,000.00	4,000,000.00	3,000,000.00	2,000,000.00	1,000,000.00
DEBT/EQUITY RATIO	-	0.50	1.00	2.00	5.00
SHARE PRICE	20.00	20.00	20.00	20.00	20.00
SHARES OUTSTANDING	300,000.00	200,000.00	150,000.00	100,000.00	50,000.00
INTEREST RATE	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**
EBIT	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00
ROE	**13.33**	**15.00**	**16.67**	**20.00**	**30.00**
EPS	2.67	4.00	5.33	8.00	16.00
WACC	**13.33**	**13.33**	**13.33**	**13.33**	**13.33**

What we mean from 100% or bread in above example corresponds to total capitalization in the above chart. We have various debt – equity combinations in above chart but the total capitalization in every case is 6 million. This is the basis of our statement – WACC remains constant.

4. Business & Financial Risk

Business Risk
Risk associated with the unique circumstances of a particular company, as they might affect the price of that company's securities.

Risks can fester and spread anywhere inside an organization. Many are industry-specific, such as the regulatory concerns within financial services and healthcare. Others are common to all industries, such as supply chain capacity, financial reporting reliability, human resources availability, and consumer relationship integrity. Productivity specialist's help you identify, prioritize, and manage risks so that you can enhance performance and ultimately, business value.

Financial Risk

- An assessment of the possibility that a given investment or loan will fail to bring a return and may result in a loss of the original investment or loan.
- The risk that a company will not have adequate cash flow to meet financial obligations
- The risk that an investment will be unable to return profit to an investor.

5. M & M Model with Taxes

A financial theory stating that the market value of a firm is determined by its earning power and the risk of its underlying assets, and is independent of the way it chooses to finance its investments or distribute dividends. Remember, a firm can choose between three methods of financing: issuing shares, borrowing or spending profits (as opposed to dispersing them to shareholders in dividends). The theorem gets much more complicated, but the basic idea is that, under certain assumptions, it makes no difference whether a firm finances itself with debt or equity.

Notes:

With Taxes

Proposition 1: $V_L = V_U + T_C B$

- *V_L is the value of a levered firm.*
- *V_U is the value of an un-levered firm.*
- *$T_C B$ is the tax rate(T_C) x the value of debt (B)*

This means that there are advantages for firms to be levered, since corporations can deduct interest payments. Therefore leverage lowers tax payments. Dividend payments are non-deductible.

Proposition 2: $r_S = r_0 + \frac{B}{S}(r_0 - r_B)(1 - T_C)$

- *R_s - is the cost of equity.*
- *r_0 is the cost of capital for an all equity firm.*
- *r_B is the cost of debt.*
- *B/S - is the debt-to-equity ratio.*
- *T_c - is the tax rate.*

The same relationship as earlier described stating that the cost of equity rises with leverage, because the risk to equity rises, still holds. The formula however has implications for the difference with the WACC.

The following assumptions are made in the propositions with taxes:

- corporations are taxed at the rate T_C on earnings after interest,
- no transaction cost exist, and
- individuals and corporations borrow at the same rate
- Debt is for ever.

Concluding the discussion, the after tax cash flow of two identical firms in terms of EBIT but having different capital structure – debt – equity weight age will effect the value of firm. This is because debt in capital structure provides tax shield as interest on debt is tax deductible expense. Thus tax shield increases the value of firm: a levered firm's value is greater than the un-levered firm.

LESSON 22

PROBLEMS ASSOCIATED WITH HIGH GEARING & DIVIDEND POLICIES

The following topics will be discussed in this lecture.

- Problems associated with high gearing
- Bankruptcy costs
- Optimal capital structure
- Dividend policy
- Types of dividends and important dates
- Dividend policies
- Factors influencing dividend policy
- Irrelevance of dividend policy

1. Problems associated with high gearing

A general term describing a financial ratio that compares some form of owner's equity (or capital) to borrowed funds. Gearing is a measure of financial leverage, demonstrating the degree to which a firm's activities are funded by owner's funds versus creditor's funds.
The higher a company's degree of leverage, the more the company is considered risky. As for most ratios, an acceptable level is determined by its comparison to ratios of companies in the same industry. The best known examples of gearing ratios include the debt-to-equity ratio (total debt / total equity), times interest earned (EBIT / total interest), equity ratio (equity / assets), and debt ratio (total debt / total assets).

A company with high gearing (high leverage) is more vulnerable to downturns in the business cycle because the company must continue to service its debt regardless of how bad sales are. A greater proportion of equity provides a cushion and is seen as a measure of financial strength.
M & M model says that debt financing increases the value of firm due to tax shield. However, there are certain aspects of high gearing that discourage borrowing. These aspects are:

Bankruptcy Costs:
As debt increases, a chance of default of repayment of principal and interest increases. Investors dislike this and will result in fall in value of firm's securities. The interest tax shield should overweigh the bankruptcy cost.
Direct bankruptcy costs: in case of liquidation disposal of assets will fetch less than going concern value of assets. And there are other costs like liquidation and redundancy costs. The loss in value is normally borne by the debt holders and that's why they demand higher returns for their investment for higher gearing and eventually this will drive down the firm's security value.

Indirect Bankruptcy Costs:
When a firm goes into liquidation or approaches near bankruptcy because under sever financial distress. Employees leaving, supplier refusing to provide goods on credit, and customers even leaving fearing firm will not be able to honors its warranty and after sales services commitments. This will reduce future cash flow and therefore, value of firm.

2. Bankruptcy Costs

Bankruptcy is a legal proceeding whereby an individual or a business can declare an inability to pay back debts. Bankruptcy allows individuals or businesses to either restructure their debt and pays it back within a payment plan , or have most of their debts absolved completely.
The argument that expected indirect and direct bankruptcy costs offset the other benefits from leverage so that the optimal amount of leverage is less than 100% debt financing.

3. Optimal capital structure

Capital structure with a minimum weighted-average cost of capital and thereby maximizes the value of the firm's stock, but it does not maximize earnings per share (Eps). Greater leverage maximizes EPS but also increases risk. Thus, the highest stock price is not reached by maximizing EPS. The optimal capital structure usually involves some debt, but not 100% debt. Ordinarily, some firms cannot identify this optimal point precisely, but they should attempt to find an optimal range for the capital structure. The required rate of

return on equity capital (R) can be estimated in various ways, for example, by adding a percentage to the firm's long-term cost of debt. Another method is the Capital Asset Pricing Model (CAPM)
Capital structure is a business finance term that describes the proportion of a company's capital, or operating money, that is obtained through debt and equity. Debt includes loans and other types of credit that must be repaid in the future, usually with interest. Equity involves selling a partial interest in the company to investors, usually in the form of stock. In contrast to debt financing, equity financing does not involve a direct obligation to repay the funds. Instead, equity investors become part-owners and partners in the business, and thus are able to exercise some degree of control over how it is run.

4. Dividend Policy

The policy a company uses to decide how much it will pay out to shareholders in dividends.
Distribution of a portion of a company's earnings, decided by the board of directors, to a class of its shareholders is called dividend. The dividend is most often quoted in terms of the dollar amount each share receives (i.e. dividends per share or DPS). It can also be quoted in terms of a percent of the current market price, referred to as dividend yield.
Lots of research and economic logic suggests that dividend policy is irrelevant (in theory).

5. Types of Dividends and Important Dates:

TYPES OF DIVIDEND

1. **Cash** (most common) are those paid out in form of **"real cash"**. It is a form of investment interest/income and is taxable to the recipient in the year they are paid. It is the most common method of sharing corporate profits.

2. **Stock or Scrip dividends** (common) are those paid out in form of **additional stock shares** of the issuing corporation, or other corporation (e.g., its subsidiary corporation). They are usually issued in proportion to shares owned (e.g., for every 100 shares of stock owned, 5% stock dividend will yield 5 extra shares). This is very similar to a stock split in that it increases the total number of shares while lowering the price of each share and does not change the market capitalization

3. **Property or dividends in specie** are those paid out in form of **assets** from the issuing corporation, or other corporation (e.g., its subsidiary corporation). Property dividends are usually paid in the form of products or services provided by the corporation. When paying property dividends, the corporation will often use securities of other companies owned by the issuer.

Important Dates:

Dividends must be declared (i.e., approved) by a company's Board of Directors each time they are paid. There are four important dates to remember regarding dividends.
Declaration date: The declaration date is the day the Board of Director's announces their intention to pay a dividend. On this day, the company creates a liability on its books; it now owes the money to the stockholders. On the declaration date, the Board will also announce a date of record and a payment date.
Date of record: Shareholders who properly registered their ownership on or before this date will receive the dividend. Shareholders who are not registered as of this date will not receive the dividend. Registration in most countries is essentially automatic for shares purchased before the ex-dividend date.
Ex dividend date: Is set by the exchange where the stock is traded, several days (usually two) before the date of record, so that all trades made on previous dates can be properly settled and the shareholder list on the date of record will accurately reflect the current owners. Purchasers buying before the ex-dividend date will receive the dividend. The stock is said to trade cum dividend on these dates. Purchasers buying on or after the ex-dividend date will not receive the dividend. The stock trades ex-dividend on these dates.
Payment date: The date when the dividend cheques will actually be mailed to the shareholders of a company.

6. Dividend Policies

Stable dividend per share: look favorably by investors and implies low risk firm. it increases the marketability of firm's share. Cash flow can be planned as dividend amount can be ascertained with accuracy (aid in financial planning)

Constant dividend payout (div per share/Eps)

A fixed %age is paid out as dividend. Under this policy the dividend amount will vary because the net income is not constant. Thus results in variability of return to investors. the dividends may drop to nil in case of loss. market price of share will lower.

Hybrid dividend policy:

This contains feature of both the above mentioned policies. Dividend consists of stable base amount and %age of increment in fat income years. This is more flexible policy but increases uncertainty of future cash flow or return to investors. The extra slice of %age is only paid when there is high jump in income. So it is not regularly paid.

Fluctuating dividends:

When the firm is having investment opportunities on its plate or unstable capital expenditure, then dividends are of residual amount i.e., amount left after meeting capital expenditure.

7. Factors Influencing Dividend Policy

A-Capital Impairment Rule -- many states prohibit the payment of dividends if these dividends impair "capital" (usually either par value of common stock or par plus additional paid-in capital). Incorporation in some states (notably Delaware) allows a firm to use the "fair value," rather than "book value," of its assets when judging whether a dividend impairs "capital."

B-Insolvency Rule -- some states prohibit the payment of cash dividends if the company is insolvent under either a "fair market valuation" or "equitable" sense.

C-Undue Retention of Earnings Rule -- prohibits the undue retention of earnings in excess of the present and future investment needs of the firm

Other Issues to Consider

1. Funding Needs of the Firm
2. Liquidity
3. Ability to Borrow
4. Restrictions in Debt Contracts (protective covenants)
5. Control

8. Irrelevance of Dividend Policy

A. Current dividends versus retention of earnings

M&M contend that the effect of dividend payments on shareholder wealth is exactly offset by other means of financing.

The dividend plus the "new" stock price after dilution exactly equals the stock price prior to the dividend distribution.

B. Conservation of value

M&M and the total-value principle ensures that the sum of market value plus current dividends of two firms identical in all respects other than dividend-payout ratios will be the same.

Investors can "create" any dividend policy they desire by selling shares when the dividend payout is too low or buying shares when the dividend payout is excessive.

According to M&M, in an ideal market, dividend policy is irrelevant as long as the firm's capital investments and debt policy are fixed. Dividend payments are simply financed over time by a combination of excess retained earnings and as necessary new equity financing.

In other words value of firm is only determined by increase in earning and investment policy.

Accordingly to M&M, dividend policy does not matter.

M&M assumes perfect capital markets with no transaction cost, no floatation cost to companies and no taxes. Also, future profits are known with certainty.

We did cover in our earlier studies that valuation of share is dependent upon dividends, then why this contradiction?

The dividend irrelevance simply states the PV of dividends remains unchanged even though dividend policy may change the amount and timing of dividends.

LESSON 23

DIVIDEND POLICY & FINANCIAL PLANNING PROCESS AND CONTROL

The following topics will be discussed in this lecture.

- Dividend and value of firm
- Dividend relevance
- Residual dividend policy
- Financial planning process and control

Dividend and Value of Firm

Dividend

A taxable payment declared by a company's board of directors and given to its shareholders out of the company's current or retained earnings, usually quarterly. Dividends are usually given as cash (cash dividend), but they can also take the form of stock (stock dividend) or other property. Dividends provide an incentive to own stock in stable companies even if they are not experiencing much growth. Companies are not required to pay dividends. The companies that offer dividends are most often companies that have progressed beyond the growth phase, and no longer benefit sufficiently by reinvesting their profits, so they usually choose to pay them out to their shareholders also called payout.

Value of firm

The term 'valuation' implies the task of estimating the worth / value of an asset, a security or a business / firm. The price an investor or a firm is willing to pay to purchase a specific asset/security would be related to this value. Obviously, two different buyers may not have the same valuation for an asset/ security as their perception regarding its worth/value may vary; one may perceive the asset/business to be the higher worth (for whatever reason) and hence may be willing to pay a higher price than the other. A seller would consider the negotiated selling price of the asset/business to be greater than the value of the Asset / business/firm he is selling.

1. **Dividend relevance**

A. **Preference for Dividends**

- Uncertainty surrounding future company profitability leads certain investors to prefer the certainty of current dividends.
- Investors prefer "large" dividends.
- Investors do not like to manufacture "homemade" dividends, but prefer the company to distribute them directly.
- As a mean of resolving the uncertainty early, investors prefer dividend paying stock rather than non-dividend paying.
    - taxation: individual bracket, on capital gains vs. dividends
    - liquidity preference
    - Financial signaling: Dividends have impact on share prices because it indicates the firm's profitability as well. Accounting earnings may not be a influencing factor as compared to increase in dividend.

B. **Taxes on the Investor**

- Capital gains taxes are deferred until the actual sale of stock. This creates a timing option.
- Capital gains are preferred to dividends, everything else equal. Thus, high dividend-yielding stocks should sell at a discount to generate a higher before-tax rate of return.
- Certain institutional investors pay no tax.
- Corporations can typically exclude 70% of dividend income from taxation. Thus, corporations generally prefer to receive dividends rather than capital gains.
- The result is clienteles of investors with different dividend preferences. In equilibrium, there will be the proper distribution of firms with differing dividend policies to exactly meet the needs of investors.
- Thus, dividend-payout decisions are irrelevant.

Residual Dividend Policy

If a company does not pay all the profit to shareholders in the form of dividend then the debt equity ratio will change. In this section we will assume that company do have some potential opportunities and will finance these opportunities first and any remainder profit will be paid as dividend and the debt equity ratio will be held constant.

An approach that suggests that a firm pay dividends only if there are no potential opportunities for expansion or there's some profit left after financing the potential opportunities, represents residual dividend policy.

Sr #	After Tax Earning	New Investment	Additional Debt	Retained Earning	Additional Stock	Dividends	D/E
1	2,000.00	6,000.00	2,000.00	2,000.00	2,000.00	-	0.50
2	2,000.00	5,000.00	1,666.67	2,000.00	333.33	-	0.50
3	2,000.00	4,000.00	1,333.33	2,000.00	666.67	-	0.50
4	2,000.00	3,000.00	1,000.00	2,000.00	-	-	0.50
5	2,000.00	2,000.00	666.67	1,333.33	-	666.67	0.50
6	2,000.00	1,000.00	333.33	666.67	-	1,333.33	0.50
7	2,000.00	-				2,000.00	

The main objective to present this table is to aid your understanding that how debt equity ratio is held constant under residual dividend policy. This table complies with the definition of the policy presented above, which state that first acceptable opportunities will be financed and if there's any profit left that will be distributed as dividend.

The first column refers to various situations and we will discuss couple of such scenarios.
Taking the 2nd scenario, if the profit is Rs. 2000 and a potential opportunity exists which needs Rs 6000. This 6000 shall be financed by three items: 2000 from loan, 2000 from additional equity and 2000 profit. This is because we need to keep the debt equity ratio at 0.50. You can see in this case we don't have anything left to pay as dividend to shareholders. Now coming to case # 6 where we have 2000 profit and investment 1000 is needed for a potential project. So we have 1000 remaining profit but we are not going to distribute 1000 as dividend. Why?

The answer to the question is pretty simple: if we pay out 1000 as dividend then the debt equity ratio of 0.50 is no longer there. (Try it yourself by changing the above table).
The company needs to seek an amount of loan that could ensure desired D/E ratio. In this case, this can be ensured by taking a loan of 1/3rd* of the remainder profit of 1000 – Rs.333/-. Now consider here the after financing the potential opportunity of Rs 1000, and obtaining loan of Rs 333, we have now Rs. 1,333/- left which can be paid as dividend and this will ensure that debt equity ratio is same.
(* D/E ratio of 0.50 means that debt is 1/3rd and equity is 2/3rd)

Dividend payments may increase or reduce shareholder wealth. The dividend policy adopted should be aimed at maximizing shareholder wealth in line with corporate objectives, and we need to examine whether there is any particular dividend policy which maximizes shareholder wealth. Is a high dividend payment policy better than a low payment policy?

companies and to estimate its impact on share market price. Dividend policy in practice in foreign countries, its necessities and shortcomings are investigated in the paper. During the research dividend policy in practice is determined in Lithuanian companies; the impact of net profit changes on dividends is investigated; the correlation between dividends payments and share market price is determined.

There are four kinds of dividend policy in practice:

- residual dividend policy;
- stable or dividend growth policy;
- stable net profit/dividend payment ratio dividend policy;
- Premium dividend policy.

The investigation which has been carried out in few companies reveals the impact of dividends payments on share market price. However, it is necessary not to forget that capital market is at the forming stage and most companies put into practice residual dividend policy in order to strengthen their position in the market.

To wrap up this topic we need to consider the following factors when we are confronted with dividend policy:

- A firm must endeavor to establish a dividend policy that maximizes shareholders wealth.
- Mostly it is believed that if a firm does not have investment opportunities on its plate, it should return / distribute funds to shareholders.
- It is not necessary to pay out everything but firm may wish to stabilize the dividends.
- There must be preference for dividend.
- It appears realistic to have some value associated with modest dividend as compared to nothing.
- The value of firm's stock is unchanged. Whatever the pattern of dividend payout, the value of stock will be the same. the reason is simple:
- The increase in dividend in one year is exactly offset by the decrease in later year, so the net effect is nil.
- Dividends are relevant because investors like to have higher dividends. if there's one higher dividend and other dividends are constant, the stock price will rise.

Financial Planning Process and Control

Financial planning is often thought of as a way to manage debt, but a good financial plan really is a way to make certain that you have financial security throughout your life. Many small business owners consider their business as their investment in their future, but that is a huge risk to take. As any economist will tell you, diversification is the only sure way to create security in the long run. Your business is one stream of income. Putting together a financial plan that allows for multiple streams of income is what provides you security in the longer term.

The essential components of a good financial plan are investing, retirement planning, insurance, borrowing and using credit, tax planning, having a will, and ensuring the right people receive your assets. Financial planning is the process of meeting your life goals through the proper management of your finances. Life goals can include buying a home, saving for your child's education or planning for retirement.

The financial planning process involves gathering relevant financial information, setting life goals, examining your current financial status and coming up with a plan for how you can meet your goals given your current situation and future plans.

There are personal finance software packages, magazines and self-help books to help you do your own financial planning. However, you may decide to seek help from a professional financial planner if:

- You need expertise you don't possess in certain areas of your finances. For example, a planner can help you evaluate the level of risk in your investment portfolio or adjust your retirement plan due to changing family circumstances.
- You want to get a professional opinion about the financial plan you developed for yourself.
- You don't feel you have the time to spare to do your own financial planning.
- You have an immediate need or unexpected life event such as a birth, inheritance or major illness.
- You feel that a professional adviser could help you improve on how you are currently managing

A financial planner is someone who uses the financial planning process to help you figure out how to meet your life goals. The planner can take a "big picture" view of your financial situation and make financial planning recommendations that are right for you. The planner can look at all of your needs including budgeting and saving, taxes, investments, insurance and retirement planning.
In addition to providing you with general financial planning services, many financial planners are also registered as investment advisers or hold insurance or securities licenses that allow them to buy or sell products. Other planners may have you use more specialized financial advisers to help you implement their recommendations. With the right education and experience, each of the following advisers could take you through the financial planning process. Ethical financial planners will refer you to one of these professionals for services that they cannot provide and disclose any referral fees they may receive in the process. Similarly, these advisers should refer you to a planner if they cannot meet your financial planning needs.

The Financial Planning Process consists of the Following five Steps

1. **Establishing and defining the client-planner relationship.**

The financial planner should clearly explain or document the services to be provided to you and define both his and your responsibilities. The planner should explain fully how he will be paid and by whom. You and the planner should agree on how long the professional relationship should last and on how decisions will be made.

2. **Gathering client data, including goals.**

The financial planner should ask for information about your financial situation. You and the planner should mutually define your personal and financial goals, understand your time frame for results and discuss, if relevant, how you feel about risk. The financial planner should gather all the necessary documents before giving you the advice you need.

3. **Analyzing and evaluating your financial status.**

The financial planner should analyze your information to assess your current situation and determine what you must do to meet your goals. Depending on what services you have asked for, this could include analyzing your assets, liabilities and cash flow, current insurance coverage, investments or tax strategies.

4. **Developing and presenting financial planning recommendations and/or alternatives.**

The financial planner should offer financial planning recommendations that address your goals, based on the information you provide. The planner should go over the recommendations with you to help you understand them so that you can make informed decisions. The planner should also listen to your concerns and revise the recommendations as appropriate.

5. **Implementing the financial planning recommendations.**

You and the planner should agree on how the recommendations will be carried out. The planner may carry out the recommendations or serve as your "coach," coordinating the whole process with you and other professionals such as attorneys or stockbrokers.

The Control Process:
When plans are finalized and put to action or implemented, then the actual performance is compared with the budgeted numbers. The difference between the actual and budgeted numbers is called variance. This variance is investigated as to know the real causes of the difference. The investigation leads to initiate the corrective action and to adjust the budget of future periods. The investigation result is known as feedback. There are three types of feedback emerging from investigation of variance.

1. **Change The Strategy or Course of Action** – If something went wrong with strategy, the course of action is fine tuned or changed to ensure future actual results conform to original plan. For example, if sales was less than the budgeted and variance investigation revealed that sales force could not be motivated then some incentives and bonuses can be offered to motivate the sales force. The future period budgets will be adjusted for the proposed incentive expenses.
2. **Do Nothing** – if the results are in line with the planned, no action is required.
3. **Change The Plan** – Targets or plan itself is revised rather than changing strategy. For example the targeted profit is scaled down.

For example we continue the example in 1 above, if sales were less than budgeted and investigation revealed that the sales target was not realistic, then the sales targets will be adjusted for future period.

LESSON 24

BUDGETING PROCESS

The following topics will be discussed in this lecture.

- Budgeting process
- Purpose / functions of budgets
- Cash budgets – Preparation & interpretation

The Budget Process

The Budget process allows the company to:

- set its fiscal objectives in respect of revenue, expenditure, debt repayment and investment;
- maintain an effective fiscal control and plan for the coming year and beyond;
- allocate the available resources, consistent with the Company's strategic objectives and priorities;
- fulfill the legislative requirements for the Budget; and
- Seek authority from Parliament for spending.

All Managers have a key role in the budget process. Together, they agree on the budget strategy and priorities for spending. On an individual level, Managers identify priorities for departmental chief executives to guide preparation of Budget submissions.

Budget Preparation Process:

1. Budget Policy & Details – Communicating To All

This includes disseminating details like the budgeting period, time table and formation of budgeting committee.

The main objective is to make clear of the scope and roles of people involved in this process. Normally, budgeting period is a period of 12 months. It may be calendar year or any combination of 12 months. However, it is always broken down into 12 periods of one month or into quarters because of comparison with actual performance and control purposes.

This process is formalized by forming a committee comprising of different front line managers and a very senior person is appointed to head this committee. Such a person should have a clear vision of future and unambiguous understanding of corporate objectives. Budgets are used to translate the ultimate objectives into monetary terms as a course of action to accomplishment of those objectives.

A budget has to be finalized before the start of the period for which it is being prepared. For example, budget for 2006 must be completed before January 2006. The time to complete budget will vary firm to firm, on the type of budget and the budget period. There are different phases in budget preparations and timeliness is set for each phase.

2. Determining The Limiting Factor

Budget preparation normally begins with the identification of limiting factor. This refers to a factor that limits the stretch of company or hinders company's achievement of specific objective. The first step will be to determine the sales during the budget period. The first question will be "do we have the capacity to produce this much?" Assuming that the answer is "no" then, production capacity is the limiting factor. You can't achieve what you have determined and need to cut-down your plans or revise your target sales.

The other areas may be the availability of labor force and/or raw materials. If there's no limiting factor then company can start with the target sales and if there's one that hampers target, then it would be what can be achieved with the available resources.

3. Production Budget Preparation

The primary source of inflow comes from the principal activity or sale of goods. Therefore, in budget preparation sales is the kick off point.

Sales budget is prepared in quantitative form. Each product sales is mentioned in number of units to be produced. There is a standard specification of a unit in terms of the input material requirements; labor time and amount of overhead needed to manufacture it. There's also a standard selling price of each product unit.

Sales in monetary term are calculated by multiplying number of units to be produced by standard selling price.

Next step will be to determine the expense side of number of units to be produced in the budget period. This is known as production cost budget and is divided into three categories.
First step will be to determine the total raw material requirements by multiplying the number of units to be produced by standard quantities of input materials. The dollar value of direct material cost is calculated by multiplying derived quantities by the standard purchase price.
In second step, direct material requirements are worked out. Standard time to produce one unit is multiplied with number of units to be produced. The total production hours are multiplied by standard labor rate per hour to reach at total labor cost.
The third segment in cost of sales determination is to estimate the overhead to be absorbed per unit of output. This is normally done by dividing the estimated amount of overheads by the activity level – labor hours.
Adding these three segments – direct materials, direct labor and overhead render total cost of production.

4. Other Ancillary Policy Issues Determination

The other items that are determined in this phase includes but not limited to the minimum level of finished goods level, purchases of each raw materials and raw material ending inventory levels.

5. Functional Budgets & Negotiation

After the sales and production cost budget has been determined then comes the step where individual departments or functional budgets are prepared. Every functional manager is required to prepared and present before the budget committee budget for the forthcoming period.

6. Adjustments & Trimming

Once the sales, production cost and functional budgets have been submitted to the committee then there are discussions and negotiations and adjustments are made in the light of available resources and short term objective of the firm. If there is shortage of resources then departmental budgets are trim down. At the point where the trade off between resources and resource utilization is achieved, it is deemed as final.

7. Finalization Of Budget & Implementation

Final version of budget is presented to head of committee who then present it to chief executive officer. If CEO has some reservations it may ask for reconsideration or can approve as is. After CEO ratification the budget is approved for implementation.

8. Variance Analysis & Investigation

After the budget is approved and implemented, the actual performance is compared with the budgeted one and variances are calculated. Variance is the difference between the actual and budgeted numbers. The variance is investigated as to know the root cause of difference. The information is used to adjust the next budgets period.

Specific Phases of the Budget

The Budget process can be divided into distinct phases:

Common Purposes/Functions behind Budget Activity

Planning -- involves determining organizational and program objectives and evaluating alternative means for their achievement. Planning also includes prioritizing.

Control -- defined as monitoring, comparing information to a standard and taking corrective action. For a **budget** to serve this function well it must have four characteristics:
It must be well-conceived (i.e., result from a good planning process) and be approved by the board
It must be broken down into increments corresponding to the periodic financial statements
Financial statements must be prepared on a timely basis and compared to the **budget**
The board and staff must take action where such comparison indicates a potential problem.
Management -- allocating resources deliberately and prudently to achieve program objectives.
This includes programming approved goals into specific projects and activities, the design of organizational units to carry out programs, staffing, and procurement of resources.
Cash Budgets

An Introduction to Preparing Cash Budgets

When many people first have to prepare a cash budget or a cash flow statement they start out thinking that they're easy to do. Half way through, though, a mist seems to settle over their eyes and they become impossible to do.

The problem usually comes down to matters such as the layout, the balances brought down and carried down and the debtors and creditors.

Most things to do with the cash itself are simple to account for: the day we receive the cash, we put it into the statement; the day we pay some cash, we put that in the statement ... that's pretty well all there is to do with the cash itself.

OK, so the cash itself is simple to deal with but there is still a lot more to be worried about I can hear you screech! Fear not, though, help is at hand on this very page.

We'll start by taking a look at the layout and contents of cash budget overall. Then we'll have a look at an alternative layout, remembering that whatever the layout, they should all give the same answer! Finally, we'll spend some time solving all of your debtor and creditor worries!

Overall Layout of a Cash Budget

Here we have a cash budget statement that starts with the cash balance brought down (b/d) from last month, last week or yesterday (this is the cash we had in the safe or our purse or wallet at the end of the previous period). Then we add the cash receipts to the balance b/d to give us the total amount of cash we then have available to us: this is the amount of money we can spend.

Cash Flow Statements	Month 1	Month 2	Month 3
Balance b/d	1,000	3,000	4,575
Receipts	12,000	18,200	26,400
Total Cash Available	13,000	21,200	30,975
Payments	10,000	16,625	21,375
Balance c/d	3,000	4,575	9,600

However, we usually have bills to pay, so we take away from the cash available the amount of money we have to pay for our bills, utilities, materials, labor and so on. Starting with the balance b/d adding the receipts and taking away the payments leaves us with the balance carried down (C/D); and this is what we have left at the end of the month ready for use at the start of the following month.

Alternative Layout of a Cash Budget

In addition to dealing with debtors and creditors, which we will deal with shortly, there is the key issue of alternative layouts. Here we see an alternative layout that has exactly the same information in as the previous example but they are presented in a different order.

Cash Flow Statements	Month 1	Month 2	Month 3
Receipts	12,000	18,200	26,400
Payments	10,000	16,625	21,375
Balance b/d	1,000	3,000	4,575
Balance c/d	3,000	4,575	9,600

Most importantly, though, the balances C/D at the end of each month are the same whichever layout we use. Just compare this new layout and the balances C/D with the previous layout we saw above.

Cash Flow Statement

This statement is governed by international accounting standard # 7

- Purpose of cash flow statement is to provide information about the inflows and outflows of cash and cash equivalents. The inflows and outflows are grouped into three categories.
- Cash & cash equivalents are short term, highly liquid investments that are both readily convertible to cash and without loss of value.
- Statement is divided into three categories
  - operating activities
  - investing activities
  - financing activities
- Purpose of cash flow statement
- To identify and assess the ability to generate future net cash flow from operations to pay debt, interest and dividends
- External financing requirements
- To see the effects of cash & non cash investing and financing transactions.
- Assess the reasons for differences between income and associated cash receipts and payments

LESSON 25

CASH FLOW STATEMENT & WORKING CAPITAL MANAGEMENT

The following topics will be discussed in this lecture.

- Cash flow statement
  - Direct method
  - Indirect method
- Working capital management
- Cash and operating cycle

Cash Flow Statement

The cash flow statement analyses changes in cash and cash equivalents during a period. Cash and cash equivalents comprise cash on hand and demand deposits, together with short-term, highly liquid investments that are readily convertible to a known amount of cash, and that are subject to an insignificant risk of changes in value. Guidance notes indicate that an investment normally meets the definition of a cash equivalent when it has a maturity of three months or less from the date of acquisition. Equity investments are normally excluded, unless they are in substance a cash equivalent (e.g. preferred shares acquired within three months of their specified redemption date). Bank overdrafts which are repayable on demand and which form an integral part of an enterprise's cash management are also included as a component of cash and cash equivalents. [IAS 7.7-8]

Presentation of the Cash Flow Statement:

Cash flows must be analyzed between operating, investing and financing activities. [IAS 7.10]

Key principles specified by IAS 7 for the preparation of a cash flow statement are as follows:

- **Operating Activities** are the main revenue-producing activities of the enterprise that are not investing or financing activities, so operating cash flows include cash received from customers and cash paid to suppliers and employees [IAS 7.14]
- **Investing Activities** are the acquisition and disposal of long-term assets and other investments that are not considered to be cash equivalents [IAS 7.6]
- **Financing Activities** are activities that alter the equity capital and borrowing structure of the enterprise [IAS 7.6]
- interest and dividends received and paid may be classified as operating, investing, or financing cash flows, provided that they are classified consistently from period to period [IAS 7.31]
- cash flows arising from taxes on income are normally classified as operating, unless they can be specifically identified with financing or investing activities [IAS 7.35]
- for operating cash flows, the direct method of presentation is encouraged, but the indirect method is acceptable [IAS 7.18]

  The **direct method** shows each major class of gross cash receipts and gross cash payments. The operating cash flows section of the cash flow statement under the direct method would appear something like this:

Cash receipts from customers	xx,xxx
Cash paid to suppliers	xx,xxx
Cash paid to employees	xx,xxx
Cash paid for other operating expenses	xx,xxx
Interest paid	xx,xxx
Income taxes paid	xx,xxx
Net cash from operating activities	**xx,xxx**

  The **indirect method** adjusts accrual basis net profit or loss for the effects of non-cash transactions. The operating cash flows section of the cash flow statement under the indirect method would appear something like this:

Profit before interest and income taxes	xx,xxx
Add back depreciation	xx,xxx
Add back amortization of goodwill	xx,xxx

Increase in receivables		xx,xxx
Decrease in inventories		xx,xxx
Increase in trade payables		xx,xxx
Interest expense	xx,xxx	
Less Interest accrued but not yet paid	xx,xxx	
Interest paid		xx,xxx
Income taxes paid		xx,xxx
Net cash from operating activities		**xx,xxx**

- Cash flows relating to extraordinary items should be classified as operating, investing or financing as appropriate and should be separately disclosed [IAS 7.29]
- The exchange rate used for translation of transactions denominated in a foreign currency and the cash flows of a foreign subsidiary should be the rate in effect at the date of the cash flows [IAS 7.25]
- Cash flows of foreign subsidiaries should be translated at the exchange rates prevailing when the cash flows took place [IAS 7.26]
- As regards the cash flows of associates and joint ventures, where the equity method is used, the cash flow statement should report only cash flows between the investor and the investee; where proportionate consolidation is used, the cash flow statement should include the venturer's share of the cash flows of the investee [IAS 7.37-38]
- Aggregate cash flows relating to acquisitions and disposals of subsidiaries and other business units should be presented separately and classified as investing activities, with specified additional disclosures. The aggregate cash paid or received as consideration should be reported net of cash and cash equivalents acquired or disposed of [IAS 7.39]
- Cash flows from investing and financing activities should be reported gross by major class of cash receipts and major class of cash payments except for the following cases, which may be reported on a net basis: [IAS 7.22-24]
    - cash receipts and payments on behalf of customers (for example, receipt and repayment of demand deposits by banks, and receipts collected on behalf of and paid over to the owner of a property)
    - cash receipts and payments for items in which the turnover is quick, the amounts are large, and the maturities are short, generally less than three months (for example, charges and collections from credit card customers, and purchase and sale of investments)
    - cash receipts and payments relating to fixed maturity deposits
    - cash advances and loans made to customers and repayments thereof
- investing and financing transactions which do not require the use of cash should be excluded from the cash flow statement, but they should be separately disclosed elsewhere in the financial statements [IAS 7.43]
- the components of cash and cash equivalents should be disclosed, and a reconciliation presented to amounts reported in the balance sheet [IAS 7.45]
- the amount of cash and cash equivalents held by the enterprise that is not available for use by the group should be disclosed, together with a commentary by management [IAS 7.48]

Defining Working Capital

The term working capital refers to the amount of capital which is readily available to an organization. That is, working capital is the difference between resources in cash or readily convertible into cash (Current Assets) and organizational commitments for which cash will soon be required (Current Liabilities).
Current Assets are resources which are in cash or will soon be converted into cash in "the ordinary course of business".
Current Liabilities are commitments which will soon require cash settlement in "the ordinary course of business".
Thus:

WORKING CAPITAL = CURRENT ASSETS - CURRENT LIABILITIES

In a department's Statement of Financial Position, these components of working capital are reported under the following headings:

Current Assets

- Liquid Assets (cash and bank deposits)
- Inventory
- Debtors and Receivables

Current Liabilities

- Bank Overdraft
- Creditors and Payables
- Other Short Term Liabilities

The Importance of Good Working Capital Management

Working capital constitutes part of the Crown's investment in a department. Associated with this is an opportunity cost to the Crown. (Money invested in one area may "cost" opportunities for investment in other areas.) If a department is operating with more working capital than is necessary, this over-investment represents an unnecessary cost to the Crown.

From a department's point of view, excess working capital means operating inefficiencies. In addition, unnecessary working capital increases the amount of the capital charge which departments are required to meet from 1 July 1991.

Approaches to Working Capital Management

The objective of working capital management is to maintain the optimum balance of each of the working capital components. This includes making sure that funds are held as cash in bank deposits for as long as and in the largest amounts possible, thereby maximizing the interest earned. However, such cash may more appropriately be "invested" in other assets or in reducing other liabilities.

Working capital management takes place on two levels:

- Ratio analysis can be used to monitor overall trends in working capital and to identify areas requiring closer management (see Chapter Three).
- The individual components of working capital can be effectively managed by using various techniques and strategies (see Chapter Four).

When considering these techniques and strategies, departments need to recognize that each department has a unique mix of working capital components. The emphasis that needs to be placed on each component varies according to department. For example, some departments have significant inventory levels; others have little if any inventory.

Furthermore, working capital management is not an end in itself. It is an integral part of the department's overall management. The needs of efficient working capital management must be considered in relation to other aspects of the department's financial and non-financial performance.

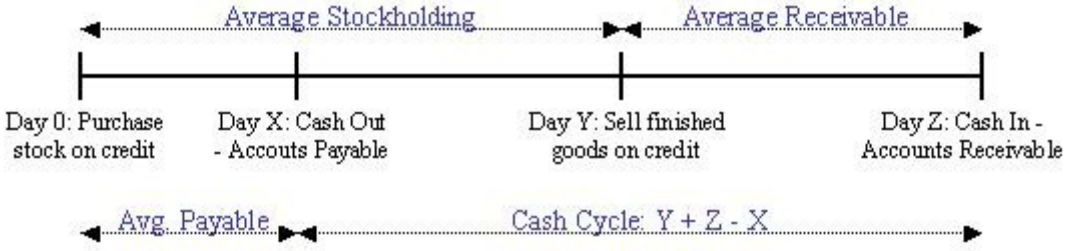
Cash Operating Cycle

Cash Conversion Cycle, also known as the asset conversion cycle, net operating cycle, working capital cycle or just cash cycle, is used in the financial analysis of a business. The higher the number, the longer a firm's money is tied up in business operations and unavailable for other activities such as investing. The cash conversion cycle is the number of days between paying for raw materials and receiving cash from selling goods made from that raw material.

- Cash Conversion Cycle = Average Stockholding Period (in days) + Average Receivables Processing Period (in days) - Average Payables Processing Period (in days)

with:

- Average Stockholding Period (in days) = Closing Stock / Average Daily Purchases
- Average Receivables Processing Period (in days) = Accounts Receivable / Average Daily Credit Sales
- Average Payable Processing Period (in days) = Accounts Payable / Average Daily Credit Purchases



A short cash conversion cycle indicates good working capital management. Conversely, a long cash conversion cycle suggests that capital is tied up while the business waits for customers to pay.
It is possible for a business to have a negative cash conversion cycle, i.e. receiving customer payments before having to pay suppliers. Examples are typically companies that employ Just in Time practices such as Dell, and companies that buy on extended credit terms and sell for cash, such as Tesco.
The longer the production process, the more cash the firm must keep tied up in inventories. Similarly, the longer it takes customers to pay their bills, the higher the value of accounts receivable. On the other hand, if a firm can delay paying for its own materials, it may reduce the amount of cash it needs. In other words, accounts payable reduce net working capital.

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LESSON 26

WORKING CAPITAL MANAGEMENT

The following topics will be discussed in this lecture.

- Working capital management
  - Risk, Profitability and Liquidity
- Working capital policies
  - Conservative
  - Aggressive
  - Moderate
- Risk and return of current liabilities

➢ Working Capital Management

Decisions relating to working capital and short term financing are referred to as *working capital management*. These involve managing the relationship between a firm's short-term assets and its short-term liabilities. The goal of Working capital management is to ensure that the firm is able to continue its operations and that it has sufficient cash flow to satisfy both maturing short-term debt and upcoming operational expenses.

Decision Criteria

By definition, Working capital management entails short term decisions - generally, relating to the next one year period - which is "reversible". These decisions are therefore not taken on the same basis as Capital Investment Decisions (NPV or related, as above) rather they will be based on cash flows and / or profitability.

- One measure of cash flow is provided by the cash conversion cycle - the net number of days from the outlay of cash for raw material to receiving payment from the customer. As a management tool, this metric makes explicit the inter-relatedness of decisions relating to inventories, accounts receivable and payable, and cash. Because this number effectively corresponds to the time that the firm's cash is tied up in operations and unavailable for other activities, management generally aims at a low net count.
- In this context, the most useful measure of profitability is Return on capital (ROC). The result is shown as a percentage, determined by dividing relevant income for the 12 months by capital employed; Return on equity (ROE) shows this result for the firm's shareholders. Firm value is enhanced when, and if, the return on capital, which results from working capital management, exceeds the cost of capital, which results from capital investment decisions as above. ROC measures are therefore useful as a management tool, in that they link short-term policy with long-term decision making.

Management of Working Capital

Guided by the above criteria, management will use a combination of policies and techniques for the management of working capital. These policies aim at managing the current assets (generally cash and cash equivalent, inventories and debtors) and the short term financing, such that cash flows and returns are acceptable.

- **Cash Management**. Identify the cash balance which allows for the business to meet day to day expenses, but reduces cash holding costs.
- **Inventory Management**. Identify the level of inventory which allows for uninterrupted production but reduces the investment in raw materials - and minimizes reordering costs - and hence increases cash flow.
- **Debtor's Management**. Identify the appropriate credit policy, i.e. credit terms which will attract customers, such that any impact on cash flows and the cash conversion cycle will be offset by increased revenue and hence Return on Capital (or vice versa).
- **Short Term Financing**. Identify the appropriate source of financing, given the cash conversion cycle: the inventory is ideally financed by credit granted by the supplier; however, it may be necessary to utilize a bank loan (or overdraft), or to "convert debtors to cash" through "factoring".

Financial Risk Management

Risk Management is the process of measuring risk and then developing and implementing strategies to manage that risk. Financial risk management focuses on risks that can be managed ("hedged") using traded

financial instruments (typically changes in commodity prices , internet rates, foreign exchange rates and stock prices). Financial risk management will also play an important role in cash management.
This area is related to corporate finance in two ways. Firstly, firm exposure to business risk is a direct result of previous Investment and Financing decisions. Secondly, both disciplines share the goal of creating, or enhancing, firm value. All large corporations have risk management teams, and small firms practice informal, if not formal, risk management.
Derivatives are the instruments most commonly used in financial risk management. Because unique derivative contracts tend to be costly to create and monitor, the most cost-effective financial risk management methods usually involve derivatives that trade on well-established financial markets. These standard derivative instruments include options, future contacts, forward contacts, and swaps.

➢ **Working Capital Policies**

- Conservative – Use permanent capital for permanent assets and temporary assets.
- Moderate – Match the maturity of the assets with the maturity of the financing.
- Aggressive – Use short-term financing to finance permanent assets.

Let's view the characteristics of each policy.

1. **CONSERVATIVE WORKING CAPITAL POLICY;**
   - high level of investment in current assets
   - support any level of sales and production
   - high liquidity level
   - Avoid short-term financing to reduce risk, but decreases the potential for maximum value creation because of the high cost of long-term debt and equity financing.
   - Borrowing long-term is considered less risky than borrowing short-term.
   - This approach involves the use of long-term debt and equity to finance all long-term fixed assets and permanent assets, in addition to some part of temporary current assets.
   - The firm has a large amount of net working capital. It is a relatively low-risk position.
   - The safety of conservative approach has a cost.
   - Long-term financing is generally more expensive than short-term financing.

2. **AGGRESSIVE WORKING CAPITAL POLICY;**
   - Low level of investment
   - More short-term financing is used to finance current assets.
   - Support low level of production & sales
   - Borrowing short-term is considered more risky than borrowing long-term.
   - Firm risk increases, due to the risk of fluctuating interest rates, but the potential for higher returns increases because of the generally low-cost financing.
   - This approach involves the use of short-term debt to finance at least the firm's temporary assets, some or all of its permanent current assets, and possibly some of its long-term fixed assets. (Heavy reliance on short term debt)
   - The firm has very little net working capital. It is more risky.
   - May be a negative net working capital. It is very risky

3. **MODERATE WORKING CAPITAL POLICY**
   - This approach tries to balance risk and return concerns.
   - Temporary current assets that are only going to be on the balance sheet for a short time should be financed with short-term debt, current liabilities. And, permanent current assets and long-term fixed assets that are going to be on the balance sheet for a long time should be financed from long-term debt and equity sources.
   - The firm has a moderate amount of net working capital. It is a relatively amount of risk balanced by a relatively moderate amount of expected return.
   - In the real world, each firm must decide on its balance of financing sources and its approach to working capital management based on its particular industry and the firm's risk and return strategy.

LIQUIDITY & PROFITABILITY:

- Lenders prefer a company having a large excess of current assets over current liabilities whereas the owners prefer a high return.
- Current assets have the advantage of being liquid, but holding them is not very profitable.
- Cash account is paid no interest.
- Accounts receivable earns no return.
- Inventory earns no return until it is sold.
- Non-current assets can be profitable, but they are usually not very liquid.
- Firms are usually faced with creating trade-off in their working capital management policy.
- They seek a balance between liquidity and profitability that reflects their desire for profit and their need for liquidity.

OPTIMAL LEVEL OF CURRENT ASSETS

A firm's optimal level of current assets is reached when the optimal level of cash, inventory, accounts receivable, and other current assets is achieved.

Cash: firms try to keep just enough cash on hand to conduct day-to-day business, while investing extra amounts in short-term marketable securities.

Inventory: firms seek the level that reduces lost sales due to lack of inventory, while at the same time holding down bad debt and collection expenses through sound credit policies.

- **PROJECTING THE ALL THREE POLICIES**

- **CONSERVATIVE = A**
- **MODERATE = B**
- **AGGRESSIVE = C**

	LIQUIDITY	PROFITABILITY	RISK
HIGH	A	C	C
NOR	B	B	B
LOW	C	A	A

The chart tells us two things:

- Profitability varies inversely with liquidity; increased liquidity can be achieved at the expense of (decreased) profitability
- Profitability & risk have same direction; in order to have greater profitability, we need to take greater risk.
- **Conclusion:** optimal level of each current asset will depend on the management's attitude towards risk & return.

Risk and Return of Current Liabilities

The goal of the return management process is to maximize earnings in the context of an acceptable level of risk.

Firm's working capital is financed from short-term borrowing, long-term borrowing, equity financing, or some mixture of all three.

The choice of the firm's working capital financing depends on manager's desire for profit versus their degree of risk aversion.

The balance between the risk and return of financing options depends on the firm, its financial managers, and its financing approaches.

LESSON 27

WORKING CAPITAL MANAGEMENT

The following topics will be discussed in this lecture.

- Classification of working capital
- Current Assets Financing – Hedging approach
- Short term Vs long term financing
- Risk of short & long term financing
- Trade off of short & long term financing

➢ Classifications of Working Capital

Working capital or current assets can be classified according to

- Components: like inventory, cash, securities, receivables
- Time basis: it may be temporary or permanent.

Temporary working capital is the amount of investment in current assets that varies according to the seasonal requirements. For example, consider an ice cream manufacturing firm. During the months of May – September the manufacturer has to keep the maximum inventory to support high level sales. During off-season like from November to January the sales are extremely low and lower investment in inventory is required. Now consider if a festival like Eid or Christmas is falling during December and this would result in high sales, then a temporary increase in inventory would be required to support this sale level.

Permanent working capital is the minimum investment in current assets that is required support long-term minimum need. Permanent working capital resembles to fixed assets in two aspects. First the dollar investment is long term despite contradiction that assets being financed are called 'current'. Second, for a growing firm, the need to increase the minimum permanent working capital is the same as of fixed assets. However, there is a case of difference between the permanent working capital and fixed asset – that is the later always changing constantly.

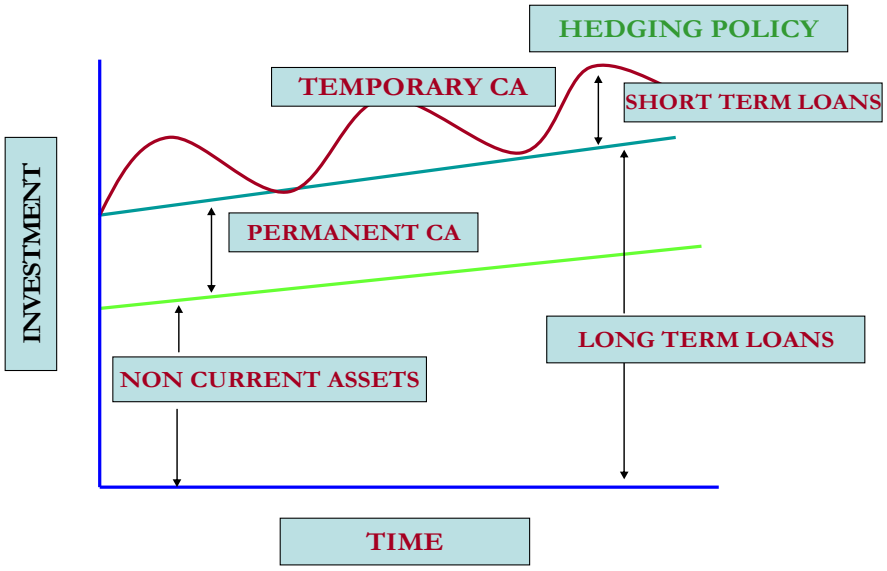
Like permanent working capital, temporary working capital also comprises of current assets in a constantly changing form. However, because the need for this part of the firm's total current assets is seasonal, we want to consider financing this level of current assets from a source which can itself be seasonal or temporary in nature. In the next section we pick up the problem of how to finance current assets.

➢ Short Term & Long Term Mix

Investment in current asset does involve a trade off between the risk and profitability. As a matter of fact the current liabilities side of working capital does not consist of active decision variables in the sense; you cannot defer payment to creditors beyond certain limits. Same is true for accrued expenses like electricity, payroll etc. There's no big room for playing with current liabilities which are also termed as spontaneous source of finance. As the underlying investment in current assets grows, accounts payable and accruals also tend to grow, in part financing the increase in assets. The issue here is how to handle assets not supported by spontaneous financing. This is termed as residual financing requirements – that is net investment after deducting spontaneous financing.

➢ Current Assets Financing – Hedging Approach

Under this approach each asset would be offset with a financing instrument of the same maturity. Short term seasonal investment requirements should be financed through short term loans and permanent current asset and all fixed assets should be financed through long term loan and equity. This can be illustrated from the following figure:



This shows that financing will be employed even when it is not needed. With a hedging approach to financing, the borrowing and payment schedule for short term financing would be arranged to correspond to the expected swings in current assets less spontaneous financing.

The rational behind hedging policy that if long term loans are used to finance the short term or temporary current assets then the firm will be paying interest when the funds are not actually needed. It is clear from the graphical view of the hedging policy that loans will only be employed during the seasonal need period.

Hedging approach to financing suggests that apart from current installments on long term debt, a firm should not employ current borrowings during seasonal troughs for asset needs as per the above figure. As the seasonal need asset arises it will borrow on short term basis. This loan will be used to pay off the borrowing with the cash released as the recently financed temporary assets were eventually reduced. For example, a seasonal increase in inventory for Eid selling will be financed with a shot term loan. As the inventory was reduced through sales, debtors will be built up. The cash needed to repay the loan would come from the collection from debtors. In this way financing will only be employed when needed.

Thus loan to support seasonal need would generate necessary fund to repayment in normal course of operation. This is known as self-liquidating principle.

- **Short Term Vs Long Tem Financing**

Although the exact maturity matching of future cash flow and debt repayments is possible under conditions of certainty but it is not appropriate when surrounded by uncertainty. Net cash flow will be off from the estimates keeping in view the firm's business risk. Resultantly the schedule of maturities of debt is very significant in assessing the risk-profitability trade off.

In general the shorter the maturity schedule of a firm's debt, the greater the risk that fir firm will default on principal and interest payment. Suppose a firm seeks a short term loan for capital expenditure. The cash flows from the capital expenditure will not be sufficient in the short run to pay off the loan. As a result, the company bears the risk that the lender may not renew the loan at maturity. This refinancing risk could be reduced in the first place by financing the plant on a long term basis – the expected loan term future cash flows being sufficient to retire the debt in an orderly manner. Thus committing funds to a long term asset and borrowing short term carries the risk that the firm may not be able to renew it loan. If the company is surrounded by bad times, the creditors might regard renewal as too risky and demand immediate payment.

Apart from refinancing risk, uncertainty is there associated with interest cost. When firm finances with long term loans it is aware of exact interest cost over the period of time for which loans are needed. If it uses short term loans then it is uncertain of interest cost. Secondly, we are well aware that short term interest

rates fluctuate more than long term. A firm forced to finance its short term debt in a period of high interest rates may pay on overall interest cost on short term loan that is higher than it would have been originally on long term loan. In short not knowing the short term interest cost of loans is to some extent a risk to the company.

The Risk Vs Cost Trade off:

The risk between long and short term financing should be balanced against the interest costs. The longer the maturity schedule of loan, the more expensive will be the financing. Further to this, the firm will be paying interest cost on loans when the loans / debts are not needed. Therefore, there are cost inducements to finance funds requirements on a short term basis.

Eventually we can work out the trade off between risk and profitability. As per our discussion over last couple of pages, we know that short term loans have greater risk than long term loans but are comparatively cheap. The margin of safety would depend on the variance between the cash flow and payment of debt. Also, margin of safety will depend on the risk preference of the management.

The management will finance a part of its expected seasonal investment, less payables and accruals on long term basis. If there's no deviation in cash flow as estimated, the firm will pay interest on excess debt during seasonal dips when the funds are not needed. Peak season requirements can be financed through long term loan. The higher the long term loans the more conservative financing policy and therefore, the higher interest cost.

Under aggressive policy the firm would finance part of its permanent current asset with short term debts. This would require that firm must renew the debt at maturity, which represents some risk to the firm. The greater the portion of permanent assets financed with short term loans, the more aggressive the policy is. In this case, the expected margin of safety linked with firm's policy can be negative, positive or even zero.

Now we are in a position to sum up our discussion or conservative and aggressive policies. Here are the salient features of both policies with regard to investment in current assets:

Conservative Policy:

- Firm finances a part of seasonal fund requirements less accounts payable on long term basis.
- If cash flow estimates do not deviate far from actual, it will pay interest on debt when actually funds are not needed.
- Higher the long term financing line, more conservative policy and higher cost.

Aggressive Policy:

- Part of permanent current assets is financed with short term debt.
- The company must arrange renewal of short term debt. It involves risk.
- The greater portion of permanent current assets is financed with short term debt, more aggressive policy it is.
- Expected margin of safety regarding ST <> LT financing can be positive, negative or neutral. Later would be hedging policy.
- Margin of safety can be increased by increasing the liquid assets.
- Risk of cash insolvency can be reduced by stretching the maturity schedule of debt or carrying larger amounts of current assets

LESSON 28

CASH MANAGEMENT

The following topics will be discussed in this lecture.

- Overtrading – Indications & remedies
- Cash management
- Motives for Cash holding
- Cash flow problems and remedies
- Investing surplus cash
- Inventory approach to cash management
- Demerits.

Overtrading – Indications & Remedies

In contrast with over-capitalization, overtrading occurs when a firm tries to do too much too quickly with too little long term capital, so that it is trying to support too large trade volume with limited capital resources.

Even a firm operating in profit may find itself in serious conditions because it is in short of money situation. Such liquidity troubles emerge from the fact that it does not have enough cash to pay off debt as it falls due. The major signs leading to overtrading are as follows:

- There is significant increase in turnover.
- Increase in current assets is rapid.
- Stock turnover the debtors turnover might slow down, in which case the rate of increase in stocks and debtors would be even greater than the increase in sales.
- Payment to creditors is pushed to increase length.
- Short term loans are exceeding the limits and firm tries to negotiate increased limits.
- The current and quick ratio falls
- The firm leads to liquid deficit situation where current liabilities are greater than current assets.

Overtrading takes place when a business accepts work and tries to fulfill it, but fulfillment requires greater resources of people, working capital or net assets than the business has available to it. It is often caused by unforeseen events such as manufacture or delivery taking longer than anticipated, resulting in cash flow being impaired.

Overtrading is a common problem, and it often happens to recently started businesses and to rapidly expanding businesses. Cash often has to leave the business before more cash comes into it. For example, wages and salaries are usually payable weekly or monthly and there may also be other expenses that need to be met promptly, such as telephone bills and rent.

Although you may pay suppliers on credit, your customers may also pay you on credit. It doesn't take much to upset the balance.

Remedies

Effective debt management and credit control can help you avoid overtrading, by ensuring that you get paid more efficiently and have the cash to pay suppliers and staff.

In addition to managing debt more effectively and improving credit control, you should also think about changing some or all of your business practices.

Set New Payment Terms

You could renegotiate payment terms, or tell customers that new terms will apply for future orders, but you should be aware that customers may object. Much will depend on the strength or weakness of your competitive position. You may lose business if your new terms are unattractive to your customers, or if you are aggressive in imposing them.

Offer Discounts for Prompt Payment

This can be effective in accelerating payment, boosting cash flow and reducing bad debts. However, there are disadvantages - it can be expensive and must be policed to ensure that customers only take discounts when they pay promptly. See our guide on invoicing and payment terms.

Use factoring or invoice discounting

Factoring involves selling your invoices to a specialist finance company which takes on the administration and cost of recovering the invoice payments. With invoice discounting, you raise a loan from a finance

Negotiate payment terms with your suppliers

You could try to negotiate different payment terms with your suppliers or you could just take longer to pay. However, this may be considered unethical, and you may find that some suppliers refuse to supply you if you habitually take too long to pay. You may therefore want to consider giving something in return for extended payment terms, such as a promise of regular orders.

Cash Management

Cash is your business's lifeblood. Managed well, your company remains healthy and strong. Managed poorly, your company goes into cardiac arrest.

If you haven't considered cash management an important issue, then you're probably undermining your business's short-term stability and its long-term survival. But how can you manage business cash better?

Cash Flow – Problems and Remedies

- Growth: a growing business needs to have more non current assets and these fixed assets must be financed.
- Seasonal business: like on Eid and religious occasions, the business activity jumps manifolds and firms need more cash to procure inventory etc.
- Capital expense or one-off expenditure.
- Losses increase the cash flow problems

- **How to improve cash flow:**

Cash flow problems can be handled in the following ways:

- decreasing the receipt float
- deferring capital expenditure (capex) and developmental work
- accelerating cash inflows which were set for recovery at a later period.
- liquidating investments
- deferring payments to creditors
- rescheduling loan payments
- planning is of immense importance especially rolling cash budgets.

Motives for Cash holding

Transactions Motive ensures that the firm has enough funds to transact its routine, day-to-day business affairs. Safety Motive protects the firm against being unable to meet unexpected demands for cash. Speculative Motive allows the firm to take advantage of unexpected opportunities that may arise

Estimating Cash Balances

- The Baumol Model

ECQ = 2 x Conversion Cost x Demand For Cash
Opportunity Cost (In Decimal Form)
WHERE:
Conversion cost = cost of converting marketable securities to cash ($/conversion)
Opportunity cost = interest earnings given up due to holding funds in a non-interest-earning cash

Investing Surplus Cash

Companies may have surplus cash or some companies may be rich in cash and this leads us to think "what to do with the surplus cash?" Obviously, the "surplus" here means temporary and it should be invested in short term for earning return on it.

Before putting the surplus cash into any bank deposit, the firm will consider three factors:

- Liquidity – company can withdraw the money out of deposit quickly and without the loss of value.
- Profitability – the deposit must offer good return for the risk being taken.
- Safety – there's no chance of loss of deposit.

There are some other factors that need to be considered when investing of surplus cash is an issue. Keeping in view the interest market it should be decided whether to put the money in a deposit bearing fixed or floating interest rate, term to maturity and penalties for early liquidation of deposit in case, firm needs cash for other purposes. Tax on profit and option of investing in international market should also be considered.

Inventory Approach to Cash Management

The answer to question "how much cash should be held?" will vary firm to firm and business to business. However, there are different models that can provide a relative guide as to how much cash a company should hold.

We can identify two types of cost that are involved in obtaining cash. First is the fixed cost that may be in terms of issuing new shares or negotiating a new loan. Second is the cost that represents the opportunity cost of keeping the money in the form of cash. This is variable portion of the total cost of cash holding. If you don't put the surplus money into earning, you are loosing money.

Inventory approach uses the same equation as of economic order quantity. We here reproduce the EOQ equation with slight change.

$Q = \sqrt{2\ FS\ /\ i}$

Where:

S = is the amount of cash to be used in each period

F = fixed cost of obtaining new funds

i = interest cost of holding cash

Q = quantity of cash to be held per period.

Drawbacks of inventory approach:

- to predict cash requirement is not a simple task. Normally, it cannot be determined with certainty.
- There are costs associated with running out of cash which are not considered by this approach.
- The other normal cost of holding cash that increases with amount held is ignored.

LESSON 29

INVENTORY MANAGEMENT

The following topics will be discussed in this lecture.

- Miller-Orr Model of cash management
- Inventory management
- Inventory costs
- Economic order quantity
- Reorder level
- Discounts and EOQ
-

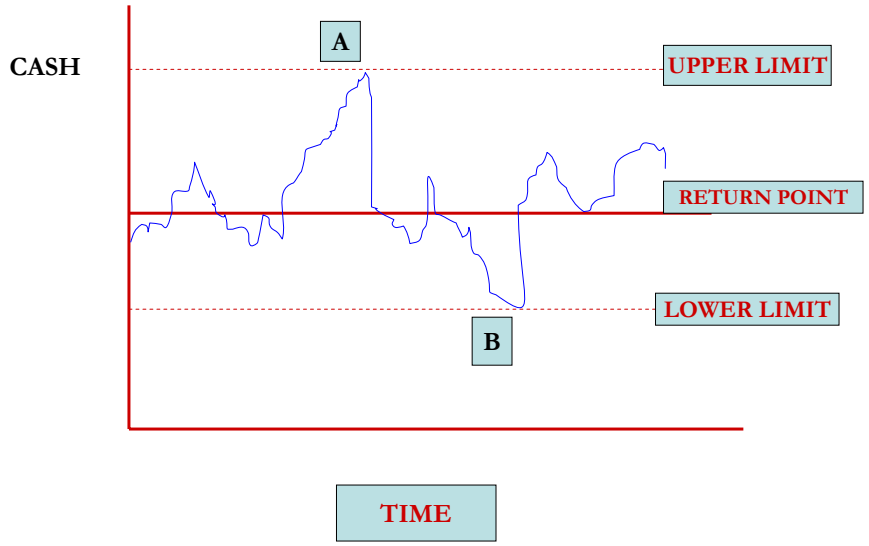
Miller-Orr Model for Cash Management:

Most firms maintain a minimum amount of cash on hand to meet daily obligations or as a requirement from the firm's bank. A maximum amount may also be specified to reflect the tradeoff between the transaction cost of investing in liquid assets (e.g. Money Market Funds) and the cost of lost interest if the cash is not invested. The Miller-Orr model computes the spread between the minimum and maximum cash balance limits as

Spread = 3(0.75 x transaction cost x variance of daily cash flows / daily interest rate) ^(1/3)
(where a^b is used to denote "a to the power b").

The maximum cash balance is the spread plus the minimum cash balance, which is assumed to be known.
The "**return point**" is defined as the minimum cash balance plus spread/3.
Whenever the cash balance hits (or exceeds) the maximum, the firm should invest the difference between the amount available and the return point; if the minimum is reached, sufficient securities should be sold to bring it up to the return point.

- **MILLER-ORR MODEL:**



Graph Explanation:

When cash balance reaches point 'A', the upper limit, company will invest the surplus to bring down the cash balance to return point.
When cash balance touches down point 'B', the lower limit, the company would liquidate some of its securities to increase the balance back to return point.
Upper and lower limits are determined as explained above.
These limits depend upon variance of cash flow, transaction cost and interest rate.

If variability of cash flow is high and transaction cost is high too, then the limits will be wide apart, otherwise narrow would suffice.
If interest rates are high then the narrow limits would be set.

To keep interest cost as low as possible, the return point is set 1/3 of the spread between the lower and upper limit.

Inventory Management:

Inventory management is the active control program which allows the management of sales, purchases and payments.

Inventory management software helps create invoices, purchase orders, receiving lists, payment receipts and can print bar coded labels. An inventory management software system configured to your warehouse, retail or product line will help to create revenue for your company. The Inventory Management will control operating costs and provide better understanding. We are your source for inventory management information, inventory management software and tools.

A complete Inventory Management Control system contains the following components:

- Inventory Management Definition
- Inventory Management Terms
- Inventory Management Purposes
- Definition and Objectives for Inventory Management
- Organizational Hierarchy of Inventory Management
- Inventory Management Planning
- Inventory Management Controls for Inventory
- Determining Inventory Management Stock Levels
-

1. Inventory costs

Inventory costs depend on the amount of space required, and how much that space costs. If the assumption is made that every part spends an equal amount of time located in inventory, then the cost of inventory can be shared equally amongst all parts. This simplification leads to equation 3.4.1 as an expression for the inventory costs:

$$\text{Inventory} = \frac{\text{SpaceRequired} \times \text{SpaceCost}}{Y} \qquad \text{(eq.3.4.1)}$$

Carrying cost:

Cost of holding an item in inventory.

Ordering cost:

Cost of replenishing inventory

Shortage Cost:

Temporary or permanent loss of sales when demand customers don't find the product in the market and switch over to substitute products.

2. Economic order quantity

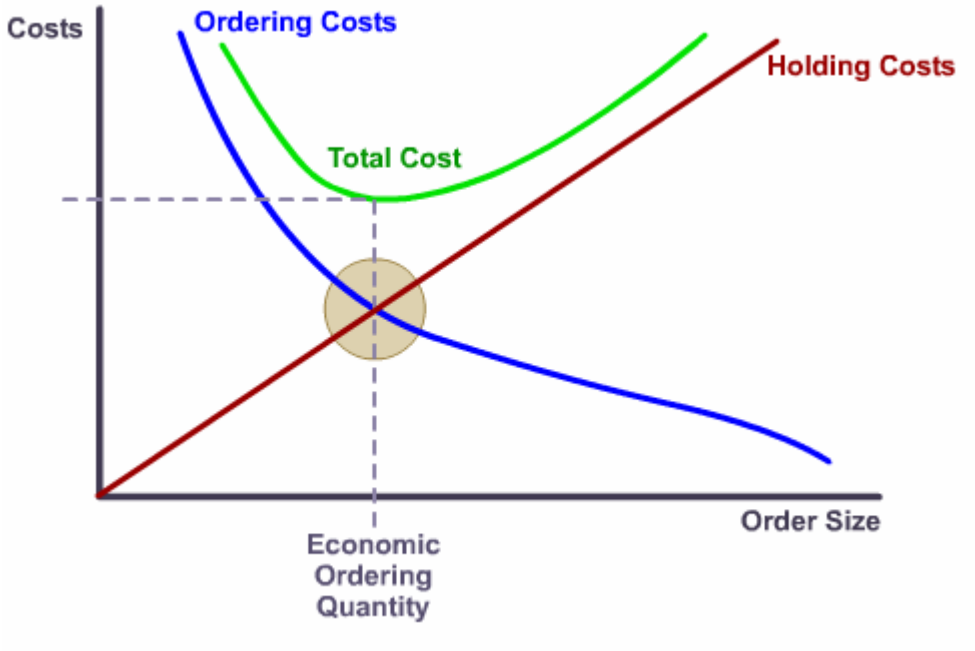
EOQ The amount of orders that minimizes total variable costs required to order and hold inventory.

Re-order quantity is the quantity for which order is placed when the stock reached re-orders level. By fixing this quantity the purchaser has not to be to re-calculate the quantity to be purchased each time he orders for material.

Re-order quantity is known as economic order quantity because it is the quantity which is most economical to order. In other words, economic order quantity is that size of quantity of the order which gives maximum economy in purchasing any material and ultimately contributes towards maintaining the material at the optimum level and minimum cost.

While setting economic order quantity, two types of cost should be taken into account:

1. **Ordering Cost:** This is the cost of placing an order with the supplier. Because of so many factors involved, it is quite difficult to quantify this cost. It mainly includes the cost of stationary, salaries of those engaged in receiving and inspection, salaries of those engaged in placing an order, etc.
2. **Cost of Carrying Stock**: This is the cost of holding the stock in storage.
   It includes the following:
   (a) cost of operating the stores,(salaries, rent, stationary)
   (b) the incidence of insurance cost;
   (c) interest on the capital locked up in store;
   (d) Deterioration and wastage of material.



A graph illustrating the relationship amongst the Ordering Costs curve, the Holding Costs curve, the Total Costs curve and the Economic ordering quantity
The single item EOQ formula can be seen as the minimum point of the following cost function:
Total cost = purchase cost + order cost + holding cost, which corresponds to:

$$TC(Q) = PR + \frac{CR}{Q} + \frac{PFQ}{2}$$

Taking the derivative of both sides of the equation and setting equal to zero, one obtains

$$\frac{dTC(Q)}{dQ} = \frac{d}{dQ}\left(PR + \frac{CR}{Q} + \frac{PFQ}{2}\right) = 0$$

The result of this differentiation is:

$$\frac{PF}{2} - \frac{CR}{Q^2} = 0$$

Solving for Q:

$$\frac{PF}{2} = \frac{CR}{Q^2}$$

$$Q^2 = \frac{2CR}{PF}$$

$$Q^* = \sqrt{\frac{2CR}{PF}} = \sqrt{\frac{2CR}{H}}$$

3. Reorder level

This is that level of material at which purchase requisition is initiated for fresh supplies. This is fixed some where between minimum level and maximum level. This is fixed in such a way that by re-ordering when material falls to this level, then in the normal course of events, new supplies will be received just before the minimum level is reached. Its formula is:
Re-order Level = Maximum consumption * Maximum re-order period
The following factors are considered in fixing this level:

1. Rate of consumption of the material
2. Minimum level
3. Delivery time; i.e., the time normally taken from the time of initiating a purchase requisition, to the receipts of material
4. Variation in delivery time.

4. Discounts and EOQ

Discounts are reductions to a basic price. They could modify either the manufacturer's list price (determined by the manufacturer and often printed on the package), the retail price (set by the retailer and often attached to the product with a sticker), or the list price (which is quoted to a potential buyer, usually in written form). The market price (also called effective price) is the amount actually paid. The purpose of discounts is to increase short-term sales, move out-of-date stock, reward valuable customers, or encourage distribution channel members to perform a function. Some discounts and allowances are forms of sales promotion.

EOQ The amount of orders that minimizes total variable costs required to order and hold inventory.

Re-order quantity is the quantity for which order is placed when the stock reached re-orders level. By fixing this quantity the purchaser has not to be to re-calculate the quantity to be purchased each time he orders for material.

LESSON 30

INVENTORY MANAGEMENT

The following topics are being covered in this hand out.

- Inventory cost – Stock out cost
- Economic Order Point
- Just in time (JIT)
- Debtors Management
- Credit Control Policy

Stock outs

The situation when a firm runs out of stock which results in shutdown of slow down of production / sales. This approach is designed to minimize the risk of stock outs at all costs. Particularly in manufacturing environment stocks-outs can have a disastrous effect on the production process.

There are two concepts associated with stock out cost. First one is maximum stock levels, which is defined as the sum of reorder level and reorder quantity and from this (minimum usage x minimum lead time) is subtracted.

This stock level is a signal to the management that there should not be additional investment in stocks because that is not needed and will be a useless. In other words, any investment over and above this level is loss incurring.

The second is the minimum level of stock or also known as buffer stock. This level refers to a warning to the management that stock level is approaching to such a low level that could result in a stock cost. We compute this stock level as under:

Buffer stock = reorder level – (average usage x average lead time)

In order to avoid stock out situation, a safety stock level should be procured and maintained.

Safety stock is the minimum inventory amount needed for an item, based on anticipated usage and expected delivery time of materials.

This cushion guards against unpredicted surge in demand or delivery time.

Economic Order Point

Economic Order Point is the level of inventory that signals the time to place re-orders of materials using economic order quantity amount. Safety stock is considered in the calculations.

We can calculate the EOP using the following formula:

EOP = SL + F $\sqrt{S}$ x EOQ x L

Where

S= Consumption per Period

L= Lead Time

F= Stock out Acceptance Factor

EOQ = Economic Order Quantity

Just In Time (JIT)

The idea explains that inventories are kept near zero level. This means that inventory is acquired in such quantity on daily basis that can support the daily production level. Therefore, there's no inventory lying in store room rather all the inventory acquired move to production hall.

The philosophy is to pull inventory through the production processes on as "as-needed" basis rather than pushing inventory through the processes on an "as-produces basis". This requires extreme accurate estimates and there no chance of an error. For example, there's a high probability of running out of stock and that could be disastrous.

JIT does not necessarily mean zero inventory level. The objective is to minimize the inventories but to increase the productivity, quality and flexibility.

Before considering JIT as inventory management model, one should consider the following factors:

- JIT is possible only when vendors are located very close to business premises or production facility.
- This means that lead time is around couple of hours.
- Very sensitive issue. Greater probability of stock outs. May turn the overall benefits to losses.
- May not be feasible for every business. Some business may maintain some inventory items on JIT and others on EOQ etc.

JIT & EOQ:
It might seem that JIT would be in a direct conflict with EOQ model. But certainly it is not the case. A JIT system rejects the statement that ordering costs are necessarily fixed at the levels. JIT tries to push down all the inventory related costs like ordering and set up on continuous basis.
By successfully reducing these ordering costs the firm is able to reduce the total cost. How close a company comes to the JIT ideal depends on the type of production process and the nature of the supplier industries, but it is a worthy objective for most companies.

Debtors Management
There are significant funds invested in accounts receivables and there must be some trade off between the profitability and risk. The optimal level of investment should be based on the benefit resulting from a specific level of investment in debtors. As you are well aware that investment in debtors influences the cash operating cycle and therefore, debtors should be governed by a careful policy.
Extending credit to debtors is a matter to be analyzed carefully because it has two types of costs involved. First, theirs is a chance of default of receiving payment and results in bad debts. Secondly, the amount to be received from debtors is used to pay off creditors. If the amount is not received at the proper time then the company has to settle creditors through loans and overdrafts, which carry a cost known as interest. The company must have clear credit standards by defining the minimum quality of credit worthiness of debtors that is acceptable to the firm.

Credit Control Policy:
The following section will shed light on credit control policy and its components.

a) Terms of sale
b) Credit analysis
c) Collection policy

Terms of sale refer to the conditions on which the company will sell its good to the customers on cash or credit. The most important issues under these terms are the credit period and the discount level and discount period.
In order to induce the debtors to settle their invoices at the earliest the company offers a discount or reduction in the invoice amount. That discount is predominantly based on receiving the payment within a very short period of time compared with normal credit period. For example, the normal terms representing the period and discount are described as "3/10, net 45".
This means that the credit period is 10 days. The credit period is the length of time that is allowed to debtors to pay off their bills. It will vary business to business and firm to firm. Normally this period is between 30 to 60 days, however, 90 days credit is not very un-common. Credit period count runs from the invoice date but can be the point of delivery of goods.
Length of credit period is influenced by several factors but the most important is the buyer's operating cycle and inventory period. Before moving ahead, let's take up operating cycle concept.

Operating cycle can be divided into two parts:
1 – Inventory period: the period of time it takes to procure, produce and sell the inventory.
In our example - inventory acquisition date Jan 01, 06 to march 01, 2006 – 60 days is known as inventory period.
2 – Accounts receivable period – the time to recover the sales.
In our example, March 01 to April 15 – 45 days period is termed as accounts receivable period.

It should be noted that by extending credit to buyer, we finance a portion of buyer's operating cycle and shorten buyer's cash cycle. And if seller's credit extension period exceeds the buyer's inventory period, then seller is not only financing the buyer's inventory purchases but also a part of the receivable as well.

On the other side if seller's credit extension period exceeds the buyer's operating cycle, then seller is effectively financing the buyer's need beyond the purchase and sale of seller's merchandise.

The other factors that influence the credit period decisions are:
Perish-ability of goods: if the shelve life of any good is short then it has low collateral value and attracts short credit period compared to the goods having longer life.

Old vs. New products: A well established product may have shorter credit period limits. New products do not have rapid turnover and often have longer credit periods associated with them. During off-season, the credit period of well established products is extended to long periods.
Credit risk: If the buyer presumes greater risk he will extend short credit period.
Size of order: A large account order normally carries longer periods because of the turnover advantage. For small orders the customers are not important.
Competition: If it is customary to extend large credit periods then all the sellers will be extending the same level. This is because every seller has to attract the buyer in order to sell his product.
Customer type: corporate customers enjoy longer credit periods compared to individual customers due to their business credibility.

LESSON 31

CREDIT POLICY

In this hand out we shall discuss the following topics:

- Cash discounts
  - Cost of discount
  - Shortening average collection period
- Credit instrument
- Analyzing credit policy
  - Revenue effect
  - Cost effect
  - Cost of debt
  - Probability of default
- Evaluating client worthiness
- Optimal credit policy
- Collection policy
- One Example of debtors management

Cash Discounts:

Cash discounts are offered by the seller to buyer in order to improve its operating cycle and this involves some cost – that is the discount cost of receiving early payment. This discount is conditional subject to payment within a stipulated period of time which is generally much shorter than normal credit period.
For example, term of "3/10, net 45" means that discount of 3% is available only if the payment is received within first ten days of delivering goods otherwise, full invoice value will be payable by the debtor on 45th day.
There's a cost of credit for seller. By availing a discount for early payment the buyer is often not in a position to ignore the cash discount.
Let's see cost of discount to seller with the help of an example.

For example, the sale terms are 2/10 net 30 for a transaction in the amount of Rs. 100,000/-.
If buyer gives up discount, he pays Rs. 100,000/- on 30th day, and will loose Rs. 2,000/- (100,000 x 2%).
Look, foregoing Rs 2,000/- may look small but let's annualize it and express it in %age:
2,000/98,000 = 0.020408
Note this is for 20 days.
For computing the loss of not taking discount on annual basis,
We will have 365/20 = 18.25 - 20-days period in one year.
Effective annual rate (EAR) = (1.020408)18.25 = 44.58%
This is only for Rs 2000 on Rs 100,000/-. You can well imagine the business activity that runs in million of rupees.
Discounts also, for seller, shorten the average collection period (ACP).

Shortening ACP:

A firm has 30 days collection period and it is offering terms of 2/10, net 30 and estimates that around 50% customers will avail this opportunity by paying within 10 days. Remaining 50% will pay after 30 days. Now the ACP will be as follows:
50% x 10 days + 50% x 30 days = 20 days
If average sales are rs.2 million per month, then receivable Rs 2 million x 1/3 = 666,666.00

Credit Instrument

The formal evidence of indebtedness is invoice or dispatch note.
When seller is supposed to dispatch goods invoice may or may not accompany goods, but may accompany a dispatch note on which buyer acknowledges the receipt of goods upon arrival at buyer's premises.

Analyzing Credit Policy:

When a firm allows credit to its customers there are some effects that should be considered.
First, allowing credit to customers means that the revenues to the firm will be delayed. A firm may charge higher prices to the customers for allowing them on credit and this will result in increased sales. Total revenues may increase but still the company will receive it late.

Secondly, if the company allows credit to customers and then offers cash discounts for early payment from debtors it will incur cost of discount. In other words, it is reducing its profits.
After allowing credit to parties the firm must arrange some loans to finance its short term operations. Such finances do carry a handsome interest rate and this need to be considered.
Increasing sales by allowing generous credit to customers also increased the probability of default and thus may incur bad debts.

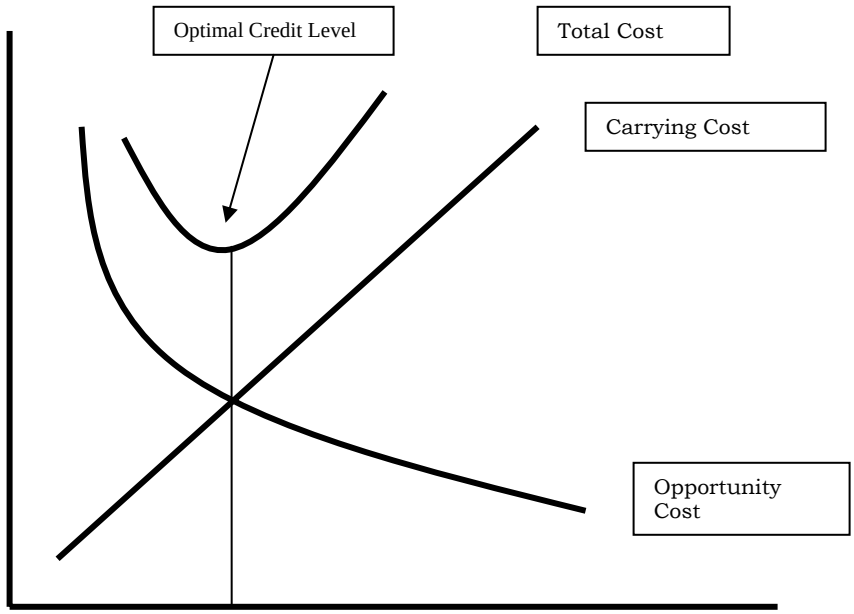
Evaluating client worthiness:
A firm who is in process of granting credit to the customers should also consider the business character of the customer. There are several ways that could guide the business as far as the credit worthiness of the client and help decide whether to extend credit or not.
The following methods to evaluate the credit worthiness are widely used in business:

- Financial statements of vendor
- Market reputation
- Banks
- Previous payment record
- Financial strength
- Capacity
- General economic conditions in vendors industry

We have discussed the credit policy and the question arises here that what should be the optimal credit policy?
The trade off between allowing credit or not is a matter which we cannot quantify exactly. We can only outline a optimal credit policy. Thus far, we have identified the following costs associated with granting credit to the customers:

a) The return on receivables
b) The losses from customers' default – bad debts
c) The collection and credit management cost

If a firm has very rigid credit policy then the cost associated will be low. Resultantly, there will be shortage of credit (extended to customers) and the cost will incur in terms of opportunity cost. This opportunity cost is the extra profit from sales due to the fact that credit was declined. (One way of increasing return is to allow credit to customers or also called investment in debtors). This cost is reduced as credit period is increased.



The total of carrying cost and the opportunity cost of credit policy is called the total credit cost curve. There is a point on the total cost curve where the total credit cost curve is minimized. This point corresponds to the optimal amount of credit or investment in receivables.
If the firm extends more credit than the minimum level the additional net cash flow from new customers will not cover the carrying costs of the investment in receivables. If the level of receivables is below this limit then the firm is forgoing profit opportunities.
In general the cost and benefits from extending credit will depend on the characteristics of particular firms and industries. For example, it is likely that firms with excess capacity, lower operational costs and repeat customers will extend credit more than other firms.

Collection Policy:
This is the last item in designing credit policy. This phase encompasses:

- The company must keep track of average collection period (ACP). The monitoring of ACP will also consider seasonal effects.
- Aging schedule: a compilation of accounts receivable by the age of each account.
- Collection effort for overdue or delinquent accounts.

To keep track of payment by customers most firms will monitor outstanding accounts. The ACP should not be more than allowed to individual customers. However, the seasonal effects should also be considered while monitoring the ACP. In seasonal times ACP will fluctuate but there should not be abnormal increase in average period.
To monitor the un-wanted stretches in ACP, the firm can use the aging analysis. Under this analysis, each customer receivable age is determined using the invoice date or processing date. Normally, the age is determined in three or four categories set up on time basis. For example, if a customer account shows a debit balance of Rs. 550,000/- on any specific date it can be broken down on aging basis like as follows:

Days	0 – 30	31- 60	61 – 90	> 90
	75,000	150,000	200,000	125,000

If the firm in above example allows 60 days credit to this customer, then you can calculate that Rs. 325,000/- (sum of last two columns) is delinquent or overdue amount, which has a definite cost. This type of analysis helps identify the overdue accounts and then efforts are directed to recover such amounts.
Collection effort is not just limited to send a letter or calling the client but there are some sensitive points involved. A situation where a customer is source of substantial source of sales or a major client and loss of which would be colossal, then it would be in firms interest not to press for recovery even if it over due. However, the recovery process should be handled by the sales team and there must be sense of strong relationship with the client. For normal clients we can use reminder, phone or send a representative for quick collection.
In extreme circumstances, the company has to refuse additional supplies until the previous balance is paid or even a legal action can be initiated for recovery. But it should be noted that there's a significant legal cost involved in litigation.

LESSON 32

CREDIT POLICY AND INTRODUCTION OF MERGERS & ACQUISITIONS

In this hand out we will discuss the following topics:

- Effects of discounts – Not effecting volume
- Extension of credit
- Factoring
- Management of creditors
- Mergers & Acquisitions
- Purpose of combinations
- Synergies

Effect of discounts – Not effecting volumes

As we have become aware of the fact that significant funds are invested in debtors, and therefore, it becomes very critical issue in working capital management. Several factors must be addressed when a policy for credit control is under discussion. These issues may include controlling collection cost, extra need of funds when credit is extended in terms of increase in debtors' investment and increase in stocks. The cost of additional loans / funds when credit is extended and saving that can be achieved by offering discounts of customers are also outstanding issues surrounding debtors' management.

A firm will always try to generate cash from debtors as quickly as possible but most of the sales activity is conduct on credit basis. One of the main reason companies have to allow credit to its customer due to competitiveness or norms of trade or industry. However, a firm will try to recover the amount from debtors quickly by surrendering some of its profit in terms of discount to clients. This is an inducement to the customers to reduce their cost of sales by having cheaper inputs by paying earlier than agreed period.

The motive behind offering discount to customers may have different secondary meaning to the firm. However, the main objective is to improve the cash flow. Other may include increasing the sales as the discounts directly affect the cost of sales of customer and customer may place enhanced order, thus increasing the turnover.

However, a fir may offer discounts just to improve the cash flow with no increase in volume. In this case, we need to evaluate that by offering discount to customer can we decrease the investment in debtors? A decrease in debtors will eventually release the investment which can be used elsewhere in business for more productivity.

The financial viability would be calculated by deducting the cost of discount from the return on investment on the amount of funds released. For example, by offering 2% discount can reduce Rs. 200,000/- worth of investment in debtors and this can be invested @ 10% in other business areas, then the net benefit would be:

Return on investment (Rs200,000)@10% = 20,000	
Less: cost of discount 2%	= 10,000
(Assuming on sales of Rs. 1/2 million)	
Net Benefit	= 10,000

Expansion of credit:

In this case we consider that if increase credit period is allowed to customers then what areas needs to be assessed. This may result in increase sales, profitability from extra sales, and length of collection period and required rate of return on additional investment in debtors as a result of increased credit period.

It is important to note that when the credit period is increased then a firm needs more investment in debtors and these additional funds do carry some cost with them.

Further, these sorts of policies have different levels of bad debts risk, greater the credit period higher the probability of default by the customers. Therefore, expansion of credit involves two types of risks – additional cost of funds and bad debts.

The financial viability would be computed by determining the total benefit of extra sales reduced by the cost of additional funds and bad debts.

Factoring:
Factoring refers to an arrangement where debt collections and some related functions are performed by someone else than the firm itself. The person or entity who performs such functions charges a fee that may be a specific percentage of total debtors. Factor normally advances a proportion of the amount to be collected and the rest when he actually recovers the amount from firm's debtors after deducting his commission or fee agreed in advance. The other factor functions may be like:
Main function of a factor is to collect the accounts receivables on behalf of seller but may also involve in invoicing and sales accounting.
Exact term of factoring will depend on mutual agreement.
Factor also takes over the risk of loss in case of bad debt.
Factor also insures client against such losses. This type of factoring is known as non-recourse.
In case of action against defaulters, factor initiate action.
Factor makes advance payments to seller in return for commission of certain %age of total debt. This is often referred as factor financing.
Factoring carries some advantages and disadvantages as well, which are as under:
Factoring has positive effect on cash cycle. Substantial portion of total debtors is received quickly and can be used to pay off creditors and avail discount from them for early settlement of their invoices.
Optimum stock level can be maintained because the business will have ample liquidity to pay for stocks it requires.
Financing (factor) is directly linked to level of sales / accounts receivables.
Reduction in collection expense and staff payroll costs because most the functions of sales administration are taken over by the factor so there's no need of some of the sales staff.
The manager of the business have more time to concentrate on other areas rather than thinking and confronting issues like slow payment from debtors.

Disadvantages:
Expensive: Normally factor charge hefty commission or fee for rendering such services.
It may have adverse effect on customers' loyalty. (Factor attitude may be harsh with customers) and may tarnish company's image. Further, it can result in loss of customers and it turn this will result in loss of sales.
For computing financial feasibility the benefit would be reduction in debtors' administration cost, payroll cost and bad debts and will be reduced by the expense like factor fee / commission. However, there may be some other issues that need to be considered in reaching at net benefit of factoring.

Management of creditors:
There is comparatively less room in management of creditors than debtors. However, this side of working capital is not less important because it is a spontaneous source of financing and also provides the basic inputs to the business.
There are three aspects of creditors' management. First, the company would like to obtain credit as big as it can. The firm must have amicable relationship with vendors. The credit period obtained from vendors will effect the operating cycle significantly.
During the period of uneven or lower cash flow the firm will try to get extension in credit. In order to adjust the operating cycle, a firm normally defers the payments to creditors rather than to take loans to finance the deficit.
Like a firm offers discounts to its customers for early recovery of invoices, creditors do offer discount for early payment from its customers. Therefore, this is very important point in creditors' management because it directly affects the cost of sale of the company. Any discount offered by the creditors for early payment of their invoices, the firm must evaluate whether or not to avail the discount. This evaluation is on the same pattern as we had for debtors. The fundamental idea will be to determine the cost and benefit and then to compute the net benefit / cost. There are two types of decisions to be made by the company. First, is to reduce the cost by taping the discount offered by creditors by paying earlier than allowed time. This is as good as increasing profit. The other side of this issue would be to burden the cash flow and company may have to seek loans. Second, would be keep the operating cycle in positive and there will not be any burden on the cash flow however, the firm will loose the discount.
These decisions are predominantly are based on level of discount, cash flow pattern, operating cycle and the portion of total creditors offering discount. These will vary firm to firm and business to business.

MERGERS & ACQUISITIONS

Growth is very essential for a company because a company can add value by expanding it business and can attract the first rate human resources. The growth can be internal and external.

During our previous studies we have covered internal growth and evaluation process. Companies acquire assets for its expansion or make investment in business. External growth involves taking over or acquiring a separate entity or already established business. However, there are significant differences in internal and external growth method.

This rationale is particularly alluring to companies when times are tough. Strong companies will act to buy other companies to create a more competitive, cost-efficient company. The companies will come together hoping to gain a greater market share or to achieve greater efficiency. Because of these potential benefits, target companies will often agree to be purchased when they know they cannot survive alone.

One plus one makes three: this equation is the special alchemy of a merger or an acquisition. The key principle behind buying a company is to create shareholder value over and above that of the sum of the two companies. Two companies together are more valuable than two separate companies - at least, that's the reasoning behind M&A.

The important reason for merger and acquisition is the increase in the sales. Operating economies can be achieved by increasing sales and utilizing fixed cost effectively.

Synergy and sources of synergy:

One plus one makes three: this equation is the special alchemy of a merger or an acquisition. The key principle behind buying a company is to create shareholder value over and above that of the sum of the two companies. Two companies together are more valuable than two separate companies - at least, that's the reasoning behind M&A.

Synergy is the magic force that allows for enhanced cost efficiencies of the new business. Synergy takes the form of revenue enhancement and cost savings. By merging, the companies hope to benefit from the following:

- Staff reductions - As every employee knows, mergers tend to mean job losses. Consider all the money saved from reducing the number of staff members from accounting, marketing and other departments. Job cuts will also include the former CEO, who typically leaves with a compensation package.
- Economies of scale - Yes, size matters. Whether it's purchasing stationery or a new corporate IT system, a bigger company placing the orders can save more on costs. Mergers also translate into improved purchasing power to buy equipment or office supplies - when placing larger orders, companies have a greater ability to negotiate prices with their suppliers.
- Acquiring new technology - To stay competitive, companies need to stay on top of technological developments and their business applications. By buying a smaller company with unique technologies, a large company can maintain or develop a competitive edge.
- Improved market reach and industry visibility - Companies buy companies to reach new markets and grow revenues and earnings. A merge may expand two companies' marketing and distribution, giving them new sales opportunities. A merger can also improve a company's standing in the investment community: bigger firms often have an easier time raising capital than smaller ones.

That said, achieving synergy is easier said than done - it is not automatically realized once two companies merge. Sure, there ought to be economies of scale when two businesses are combined, but sometimes a merger does just the opposite. In many cases, one and one add up to less than two. Sadly, synergy opportunities may exist only in the minds of the corporate leaders and the deal makers. Where there is no value to be created, the CEO and investment bankers - who have much to gain from a successful M&A deal - will try to create an image of enhanced value. The market, however, eventually sees through this and penalizes the company by assigning it a discounted share price. We'll talk more about why M&A may fail in the next tutorial.

LESSON 33

MERGERS & ACQUISITIONS

In this hand out we shall take up following topics:

- Synergies
- Types of mergers
- Why mergers fail?
- Merger process
- Acquisition consideration

Synergies and Types of Synergies: (Continued from Lecture 32)

It results from complementary activities .for instance, one firm may have substantial amount of financial resources while the other has profitable investment opportunities.

Synergy is the energy or force created by the working together of various parts or processes. Synergy in business is the benefit derived from combining two or more elements (or businesses) so that the performance of the combination is higher than that of the sum of the individual elements (or businesses). The enhanced result of two or more people, groups or organizations working together is called synergy. In other words, one and one equal three! It comes from the Greek "synergia," which means joint work and cooperative action. The word is used quite often to mean that combining forces produces a better product. However, in the field of software development, synergy is not the result. In many cases, the more people assigned to a programming job, the more the quality suffers.

The idea that the value and performance of two companies combined will be greater than the sum of the separate individual parts.

Types of Synergies:

1-Operational synergies – Discussed in Lecture 32

2- Financial synergies

Financial synergies:

If the future cash flow stream of two companies is not positively correlated then combining the two will reduce the variability of cash flow or will bring stability in cash flow thus may increase the value by having cheaper financing available. Lenders and creditors like to have stable cash flow that signals the ability of company to settle its short term and long term obligations.

Diversification normally reduces the risk. If the earnings of two combined entities remain unchanged then there are still chances of increased firm value. In this case, the reduction in the risk level will add value to the firm.

From shareholders' stand point if there are no operating economies in a merger, then it will not add value to the shareholders' wealth.

This should be noted that managers often consider the total risk as this effect the job security and diversification argument can make sense from a managerial stand point if not a shareholders'.

If the future cash flow of merged entities is not perfectly positively correlated then by merging the two cash flow variations can be reduced.

Other synergies:

Surplus Human Resources: companies with skilled managers and staff can best utilize these resources only if they have problems to solve. The acquisition of inefficient companies is sometimes the only way of using skilled human resources

Surplus cash flow: companies with large amounts of surplus cash may see the acquisition of other companies as the only possible application for these funds.

Market power: horizontal mergers may enable the company to seek a degree of monopoly power which could increase its profitability.

Organic growth: growth using mergers and acquisition is speedier than the organic growth.

Types of Mergers

From the perspective of business structures, there is a whole host of different mergers. Here are a few types, distinguished by the relationship between the two companies that are merging:

- Horizontal merger - Two companies that are in direct competition and share the same product lines and markets.

- Vertical merger - A customer and company or a supplier and company. Think of a cone supplier merging with an ice cream maker.
- Market-extension merger - Two companies that sell the same products in different markets.
- Product-extension merger - Two companies selling different but related products in the same market.
- Conglomeration - Two companies that have no common business areas.

There are two types of mergers that are distinguished by how the merger is financed. Each has certain implications for the companies involved and for investors:

- Purchase Mergers - As the name suggests, this kind of merger occurs when one company purchases another. The purchase is made with cash or through the issue of some kind of debt instrument; the sale is taxable.

  Acquiring companies often prefer this type of merger because it can provide them with a tax benefit. Acquired assets can be written-up to the actual purchase price, and the difference between the book value and the purchase price of the assets can depreciate annually, reducing taxes payable by the acquiring company. We will discuss this further in part four of this tutorial.

Consolidation Mergers - With this merger, a brand new company is formed and both companies are bought and combined under the new entity. The tax terms are the same as those of a purchase merger.

Profitable growth constitutes one of the prime objectives of most of the business firms. It can be achieved internally either through the process of introducing /developing new products or by expanding / enlarging the capacity of existing products the firm is engaged. Alternatively the growth process can be facilitated externally by the acquisitions of existing business firms. This acquisition is technically referred to as mergers, acquisitions, amalgamations, takeovers, absorption, consolidation etc.
Mergers are a tool used by companies for the purpose of expanding their operations and increasing their profit.
Usually mergers occur in a consensual setting where executives from the target company help those from the purchaser in a due diligence process to ensure that the deal is beneficial to both parties. Acquisitions can also happen through a hostile takeover by purchasing the majority of outstanding shares of a company in the open market against the wishes of the target's board. In most of the countries, business laws vary from state to state whereby some companies have limited protection against hostile takeovers. One form of protection against a hostile takeover is the shareholder rights plan, otherwise known as the "poison pill".
Why mergers fail?

Lack of planning or overoptimistic planning
Planning is a crucial exercise that will help determine the success or failure of a merging organization. However, many merging organizations do not have adequate or complete integration and implementation plans in place. Only one out of five companies that have acquired another has developed a clear and satisfactory implementation plan.
Putting the forecast results on paper is much simpler than actually achieving them. During the planning phase the synergies may be over-estimated because of the subjective judgment issues in estimations.
A major downside of the planning process is that it can take the focus away from daily business activities. It can also fail to address serious HR issues and activities that can have a strong impact on the organization. Another flaw in many M&A plans is that they often include expectations that are unrealistic and that will stretch the merging organizations beyond their capabilities.
Human integration
As discussed above, the early stages of mergers and acquisitions (i.e.
Planning and negotiation) are often carried out in secret and do not usually involve human resources in the discussions.
This lack of involvement by human resources can have a detrimental impact on the merger, since it means that many issues that are directly linked to the success or failure of the merger will have been overlooked. If legal and financial experts are driving the strategic work behind the integration, then a number of important considerations critical for the financial success of the merger, such as the productivity of the new

employees, may be overlooked unless human resources and corporate communications staff members provide their input.

Corporate culture
Even if two companies seem to have all the right ingredients in place for a successful merger, cultural differences can break the deal. It is not enough for two companies to appear to fit well on paper; at the end of the day, if the people are not able to work together, the merger will not succeed. Poor communications and inability to manage cultural differences are the two main causes of failed mergers. Cultural differences that cannot be resolved affect communications, decision-making, productivity and employee turnover at all levels of the organization.

All the best laid plans – exhaustive analyses of strategies, marketing tactics, legal issues, etc. – can fall apart if the people cannot work together. If the two workforces fail to unite behind the strategic goals underlying the consolidation, even the best financial deals and most rigorous legal contracts fail to guarantee success.

An example which demonstrates the importance of cultural differences is the Daimler Chrysler merger. The post-merger phase highlighted the difficulty of trying to integrate two very divergent cultures. Even though in the beginning, Daimler-Benz and Chrysler both expressed their commitment to working together and sharing work practices and product development methods, this commitment did not materialize, a phenomenon exemplified by the Daimler management's unwillingness to use Chrysler parts in Mercedes cars.

Lack of communications:
Employee communications is considered as being one of the most important issues which needs to be addressed during a merger or acquisition process. Poor communication between people at all levels of the organization, and between the two organizations that are merging, is one of the principal reasons why mergers fail.
Middle management and lower level employees in particular are kept in the dark when it comes to merger issues. Most of companies customize merger information for middle management and lower levels of employees. Therefore, it is not surprising that many managers find themselves learning more about their corporation from reading the daily business section of the newspaper than from their own superiors.
Not only is lack of communication a serious issue for merging organizations, the deliberate withholding of information from employees on the part of the senior executives who are dealing with the merger, is also a major problem, and contributes to confusion, uncertainty and a loss of trust and loyalty on the part of employees. In some cases, companies even feel the need to lie to their employees by making reassuring statements about the continuity of their roles and pay packages, and by falsely stating that there will be no redundancies.
Lack of information, no clear direction and confusing messages, all boil down to uncertainty, which is destructive.

Talent Departure:
An increase in the turnover rate of productive employees is one of the greatest prices of corporate mergers. Mergers and acquisitions often lead to the loss of the merging companies' greatest assets: talented employees and key decision-makers. According to the American Management Association, one out of four top performers leaves the company within 3 months of the announcement of an event involving major change in the organization and 47% of senior managers in the acquired company leave within the first year. A Wall Street Journal article estimated that 50-75% of managers in companies that have merged plan to leave within three years. Yet the decision to merge or acquire is often based on the desire to gain a talented workforce, and new knowledge and expertise. This obvious contradiction is not dealt with satisfactorily by company leaders who are not taking sufficient steps to resolve this problem. They need to realize that when employees leave the company following a merger or acquisition, they are taking with them the knowledge and expertise that was part of the reason the merger occurred in the first place.

Employees are the most important assets companies have. Yet they are totally forgotten about when a deal is being done. The boards and senior management just don't get it.

Frequently, employees do not leave of their own free will following an M&A transaction, as companies reduce their headcounts and downsize in a bid to reduce costs. At the same time, however, companies in today's economy seem to be rated more and more on their innovative capabilities and unique expertise, which reinforces the notion that employees are a company's greatest assets.
Not only do merging companies suffer a drop in productivity as a result of losing talented employees, but lower morale and a sense of insecurity on the part of the employees who remain in the newly-merged organization can also lead to productivity problems.
Remaining employees end up distrusting their employer and often become reluctant to safeguard the interests of the new company. They also become de-motivated to work to their best abilities.
The resulting loss of creative power can cripple a corporation that is competing within a rapidly changing industry.

Loss of Customers:

With the loss of employees also comes the loss of customers during mergers and acquisitions. Some of the most talented employees, responsible for bringing in valuable business to their organizations, are often the ones who leave, resulting in the loss of key customers.
All companies need to remember: it's the people who produce profits, represent the company, establish rapport with the customers, and, ultimately, are the ones that will make the combined company succeed.
Even if merging companies succeed in retaining the employees that bring in the business, customers may still decide to take their business to other companies if they fear that their level of service is going to deteriorate in the newly merged organization. Lack of communication on the part of management is therefore the culprit not only when it comes to the employees of the merging organizations, but also when it comes to their customers.

Merger and Acquisition Process:

Determining the Target (Company)

Once the management has decided to expand through mergers and acquisitions, it must determine the prospective target company in the sector it is interested in.

First step in this regard would be to evaluate the feasibility from commercial and financial viewpoint. M & A transactions are carried out as going concern and purchase of assets basis, we will highlight the areas that need special focus by the management:

Organizational information: that includes management, skill and expertise, other employees, payroll structure and appointment terms, unionization, benefit plans.

Sales & Marketing: historic sales trend and analysis, products – strengths, market share, sales net work, market reputation.

Technology: Technical expertise required to run the targeted company, future assessment, research & development required.

Financial & Accounting information: historical accounts, profitability analysis, assets and liabilities true position, accounting policies, equity analysis.

Cash & Bank: details of bank accounts, collaterals against loans, details of agreements like leases, forward rates, etc.
Tax: tax computations like for depreciation, deferred tax, any pending case with tax department, outstanding liabilities for income and sales tax, rather for other taxes as well.

Formulation of Scheme:

Once the prospecting phase is over, the companies seek the help of legal and financial consultants to finalize the details of proposed scheme of merger.

Memorandum of Association:

The object clause of amalgamated company should be examined to see if it permits continuation of the business amalgamating (transfer) company by it, if it does not, then suitable amendments / alteration must be made in the manner prescribed in the companies act.

Intimation to Stock Exchange and Notification:

As soon as the offer of merger is made, the stock exchanges where these companies are listed should be notified and the fact of the offer should be announced in the newspapers. To ensure proper disclosure, the announced is made in the form approved by the regional stock exchange.

Directors Approval of the Proposed Scheme

The proposed scheme of merger should be submitted to the Board of Director of each company for their approval.

Shareholders Approval:

The scheme, once approved by the Board of Directors, should be placed before shareholders at a general meeting for their approval. It is not a legal necessity, but the company in practice gets the scheme approved by its shareholders before they file an application for the sanction of the court.

Transfer of Assets and Liabilities, issuance of Shares, etc.

Finally, the companies can implement the scheme by transferring assets and liabilities by issuing of shares and given any other consideration to the members of the amalgamating company, as per the scheme of merger.

Cultural due diligence

When merging with another firm, most companies focus more on the deal than on the subsequent integration of the companies. This may explain, at least in part, why most of them fail.

Despite popular beliefs to the contrary, the single greatest barrier to business success is the one erected by culture.

How important is culture in an organization? In recent years it has been acknowledged as being as significant a factor in international business as the bottom line. While the mergers and acquisitions boom has slowed somewhat in 2002, the percentage of acquisitions across borders has continued to increase, expected to reach 50 percent of all M&A activity by 2003.

According to the International Labor Organization, 70 percent of mergers and acquisitions worldwide fail to meet their strategic objectives within two years. International consultants KPMG revealed in a recent study "the overwhelming cause for failure of M & As is the people and the cultural differences." Meaning that in the majority of instances, these business ventures run aground due to organizational culture conflicts.

Since knowledge is power, the obvious approach is for the acquiring party to perform a cultural due diligence before making the final decision, to determine if there is cultural synergy between the partners. This is often rejected by the company being investigated, however, since it requires allowing the (as yet uncommitted) outside faction full access to HR policy and company personnel.

LESSON 34

ACQUISITIONS

In this hand out we will take up following topics:

- **Acquisition Consideration**
- **Valuation of shares**

Acquisition Consideration

The predator and target will need to agree on following bais issues surrounding the consideration:

a) Whether shares or assets to be purchased.
b) type of consideration
c) valuation issues

a) Asset or Share Purchase

there's a difference between acquisition through assets purchase and share purchase methods.

Under asset purchase method, the purchasor only buys asset of the target company at negotiated prices without assuming any liability.

An assets purchase will enable the predator compnay to claim some tax related allowances on assets acquired. The target will have some adverse tax issues relating to the disposal of assets, which is normally higher than the book value.

A share purchase is more complex because of the fact that predator has to own the laibilities as well. The administration and documentation is much more complicated and lenghty coupled with the consultancy costs.

There is a technique called hivedown which can reduce the risks and disadvantages of share purchase method. This is applied when only part of the business is being taken over by the purchaser. The part is transferred to a new entity of the vendor without raising any tax adverse consequences.

Type of consideration:

The financial consideration to be paid to target company in mergers can be classified in to following categories:

Cash

Share – ordinary or preferences

Debt

The value of ordinary shares is generally the market value at the time of merger. However, normally the negotiated value per share is higher than the market value. The following points should be kept in mind in case shares are the consideration of merger transaction:

Depression of shares: the purchasor may feel that current prices will rise in future because the share market is bearish or the value of acquiring company's shares are temporarily depressed. Thus, vendor may be getting the shares cheap.

Dilution of shareholding: Issuing new shares to be paid to target cmpany will result in dilution of shareholdings of existing shareholders and they may feel it unpleasant.

Unquoted share: there is problem in valuation of private company's share because there's no mechanism for this. The price or value is determined through series of tense negotiations.

Debt / Equity ratio: issuing new shares will throw off debt equity ratio and any large variance is difficult to bridge and may take years to restore.

Valuation of shares:

when the consideration of merger transaction has been decided to be settled in shares, then comes the stage to determine the value of share. There are some reason why we need to value the shares.

- to set up the terms of takeovers
- to value the company for stock exchange listing
- for tax purposes
- to value shares – for establishing value of share of retirng directors

The different values are returned by different methods of valuation and sometimes these are wide apart. In this scenario, the final value will be a matter of negotiations between the both parties.

Quoted shares:
We have already coverd that shares should be traded to the point where the present value of future dividend stream is equal to the current share price. This is what meant by the value of share. Given the fact that markets are not perfect as to the availbility of information to investors, the prices quoted on stock exchanges are normally a easure of the value at which the last bargain was made.
More importantly it is the measure of the price at which stock market investors are prepared to deal in relatively small quantity of shares.
In an efficient market share prices should reflect alll publicly available information and if available are normally considered to be the best guide for valuation. In practice in an acquisition it is unlikely that the bidding company would succeed by offering less than current market price, there is normally significant premium over market prices.

Unquoted Shares:
The valuation of unquoted shares is a matter to be handled by the accountants. The method of share valuation of shares in private compan involves comparison of its activities with those of similar quoted company.
However, we may employ following valuation methods for unquoted shares. We divide them into two broad categories:

Income based approach:
- Present value method
- Dividend valuation
- P/E ratio

Asset based approach:
- book value
- replacement cost
- break up value

Income Based Approach – Present value method:
This approach has its foundation in the present value rule, where the value of any asset is the present value of expected future cash flows that the asset generates.
Value $=CFt/ (1+r)^{t}$
where
n = Life of the asset
CFt = Cash flow in period t
r = Discount rate reflecting the risky-ness of the estimated cash flows
The cash flows will vary from asset to asset -- dividends for stocks, coupons (interest) and the face value for bonds and after-tax cash flows for a real project. The discount rate will be a function of the riskiness of the estimated cash flows, with higher rates for riskier assets and lower rates for safer projects. You can in fact think of discounted cash flow valuation on a continuum. At one end of the spectrum, you have the default-free zero coupon bond, with a guaranteed cash flow in the future. Discounting this cash flow at the risk less rate should yield the value of the bond. A little further up the spectrum are corporate bonds where the cash flows take the form of coupons and there is default risk.
These bonds can be valued by discounting the expected cash flows at an interest rate that reflects the default risk. Moving up the risk ladder, we get to equities, where there are expected cash flows with substantial uncertainty around the expectation. The value here should be the present value of the expected cash flows at a discount rate that reflects the uncertainty.

The Underpinnings of Discounted Cash flow Valuation
In discounted cash flow valuation, we try to estimate the intrinsic value of an asset based upon its fundamentals. What is intrinsic value? For lack of a better definition, consider it the value that would be attached to the firm by an all-knowing analyst, who not only knows the expected cash flows for the firm but also attaches the right discount rate(s) to these cash flows and values them with absolute precision.
Hopeless though the task of estimating intrinsic value may seem to be, especially when valuing young companies with substantial uncertainty about the future, we believe that these estimates can be different

from the market prices attached to these companies. In other words, markets make mistakes. Does that mean we believe that markets are inefficient? Not quite. While we assume that prices can deviate from intrinsic value, estimated based upon fundamentals, we also assume that the two will converge sooner rather than latter.
The value of equity is obtained by discounting expected cash flows to equity, i.e., the residual cash flows after meeting all expenses, reinvestment needs, tax obligations and net debt payments (interest, principal payments and new debt issuance), at the cost of equity, i.e., the rate of return required by equity investors in the firm.
Value of Equity = CF to Equity (t)/ $(1+k\ e)^t$

Where

CF to Equity (t) = Expected Cash flow to Equity in period t
Key = Cost of Equity
The dividend discount model is a specialized case of equity valuation, where the value of the equity is the present value of expected future dividends.
The value of the firm is obtained by discounting expected cash flows to the firm, i.e., the residual cash flows after meeting all operating expenses, reinvestment needs and taxes, but prior to any payments to either debt or equity holders, at the weighted average cost of capital, which is the cost of the different components of financing used by the firm, weighted by their market value proportions.
Value of Firm =CF to Firm (t) / $(1+WACC)^t$
Where

CF to Firm (t) = Expected Cash flow to Firm in period t
WACC = Weighted Average Cost of Capital
The value of the firm can also be obtained by valuing each claim on the firm separately. In this approach, which is called adjusted present value (APV), we begin by valuing equity in the firm, assuming that it was financed only with equity. We then consider the value added (or taken away) by debt by considering the present value of the tax benefits that flow from debt and the expected bankruptcy costs.

Value of firm = Value of all-equity financed firm + PV of tax benefits + Expected Bankruptcy Costs

In fact, this approach can be generalized to allow different cash flows to the firm to be discounted at different rates, given their riskiness.
In short, the present value approach may take a form of:

Let us assume that X plc was considering the acquisition of Y plc:
Then the value of Y plc would be computed as:
Present value of future earnings of X and Y combined at
Discount rate reflecting the systematic risk of both
Less:
PV of future earnings of predator firm y using discount rate appropriate for systematic risk of firm X is equal to = maximum value of firm Y

Income Based Approach - Dividend Valuations:
Please refer to your earlier handouts for dividend valuations as we have already covered. Just to recall to your mind, here is the summary of dividend valuations.

We can use no-growth and constant growth models in mergers & acquisitions

Po = do/ke no-growth model

Po = d1/ke – g constant growth model

We need to determine ke = shareholders' required return and future dividends.

Cost of equity of other firms in industry can be used and adjusted by considering beta.

When comparing with other firms we must ensure that the company is of equal size and is in same business line.

Future dividend stream can be estimated from the past dividends utilizing statistical techniques.

Income based approach – P/E method:
P/E ratio can be defined as = Price per share / EPS (latest)
As with the dividend yield this formula is then modified to work out value of unquoted shares. That is:

Value per share = EPS X appropriate P/E ratio

The basic choice for P/E rationshould be a quoted firm comparable to company being acquired in terms of size and falling in the same industry.
Some problems are associated with using P/E ratios and those should be considered:

High P/E ratio may be due to:

- The company may be experiencing consistent growth over the recent past years.
- Based on some future expectations
- Share price may have gone up in wake of takeover bid.
- High security shares

Low P/E ratio may be due to:
Low profit & losses mix in recent past
Expected future losses
Low security
Difficulties in using this method:
A firm may not have exact similar size company and growth prospects.
P/E ratio is based on past data, where as future earnings are center point of target company in m & a.
Anyways this cannot be ignored because of its importance.

LESSON 35

SHARE VALUATIONS

We shall take up following topics in this hand out:

- Assets Based Share Valuations
- Hybrid Valuation methods
- Procedure for public takeover
- Procedure for private takeover
- Anti-takeover tools
  - Poison pill
  - Pac man
  - White knight
  - Counter offer
  - Disposal of key assets
  - Acquisition by the target
  - Shark repellent
  - Political pressure

Assets Based Share Valuations

Asset-based methods typically involve restating both assets and liabilities to their current values to arrive at a net asset value. The restatement can be done on an individual component level (discrete valuation) or collectively (collective valuation). Given the relative difficulty of individually valuing a variety of assets, such as real estate, machinery and equipment, and inventory, it is often necessary to employ valuation specialists. Collective valuation requires a single analysis, which identifies the collective value of the assets and liabilities over and above their recorded value (i.e., a price-to-book multiple). Even with asset-based models, value remains a function of expected benefits to the owners. The value of assets is generally derived from either future income-generating potential or liquidation value, depending on the circumstances at a given time.

Some add a fourth approach to valuation to the three that we describe in this handout. They argue that you can argue the individual assets owned by a firm and use that to estimate its value – asset based valuation models. In fact, there are several variants on asset based valuation models. The first is liquidation value, which is obtained by aggregating the estimated sale proceeds of the assets owned by a firm. The second is replacement cost, where you evaluate what it would cost you to replace all of the assets that a firm has today.

While analysts may use asset-based valuation approaches to estimate value, we do not consider them alternatives to discounted cash flow, relative or option pricing models since both replacement and liquidation values have to be obtained using one or more of these approaches. Ultimately, all valuation models attempt to value assets – the differences arise in how we identify the assets and how we attach value to each asset. In liquidation valuation, we look only at assets in place and estimate their value based upon what similar assets are priced at in the market. In traditional discounted cash flow valuation, we consider all assets including expected growth potential to arrive at value.

The two approaches may, in fact, yield the same values if you have a firm that has no growth assets and the market assessments of value reflect expected cash flows.

Asset based methods are generally considered suitable when shareholdings > 50% are being valued. Such shareholdings give the holder the right to control the acquisition and disposal of the underlying assets. Therefore, if there are assets not needed for generation of income, the controlling shareholders may cause these to be realized to generate cash.

Book Values: these figures are bases on past or historical costs and are meaningless and useless to be used for merger transaction valuations.

Replacement Cost: this should provide a measure of the maximum amount that any buyer should pay for the whole business, since it represents the total cost of forming the business from scratch. However, a major element of any business as a going concern is likely to be the goodwill. Since this can only be defined as income based value of business – tangible assets it may be seen that there is no real way of applying a pure asset based value to a business. It is always necessary to consider an income-based value as well.

Break up value: is the assets in the business will often be less than any other computed value. It represents the minimum price, which should be accepted for the sale of a business as a going concern, since if the

income based valuations give figures lower than the break up value it is apparent that the owner would be better off by ceasing to trade and selling off all the assets piecemeal.
However, when a break up is considered in this way it must be remembered to include such items as redundancy costs, liquidator's which may have substantial effect on the final outcome.

Hybrid Methods – Mix Of Asset Based & Income Method:
The income and asset-based approaches to valuation have relative strengths as well as obvious limitations. For example, the income approach allows for specific and direct estimation of future benefits to the owners, which is consistent with the theory of value. On the other hand, if the estimation of future benefits is directly based on historical income, the precision of the estimate will depend heavily on the persistence embodied in the historical income measure and on the growth assumptions incorporated into the model. If, for example, current or historical income contains large transitory components, the relationship between historical and future income may be distorted. In addition, to the extent an inappropriate discount rate is utilized, value estimates will be adversely affected.
Asset-based valuation approaches can be effective in that the accurate identification of individual asset and liability values will yield a reliable value estimate. In addition, unlike the income approach, an equity discount rate, the estimation of which can have a significant impact on the valuation conclusion, is not required for an asset-based approach. On the other hand, it is often difficult to accurately restate book value to current value for an array of assets, especially when a significant amount of unrecorded intangible assets exists.
This method includes the characteristics of both income and asset based valuation methods. For example, the income approach allows for specific and direct estimation of future benefits to the owners, which is consistent with the theory of value.
The estimation of future benefits is directly based on historical income; the precision of the estimate will depend heavily on the persistence embodied in the historical income measure and on the growth assumptions incorporated into the model asset-based valuation approaches can be effective in that the accurate identification of individual asset and liability values will yield a reliable value estimate. in addition, unlike the income approach, an equity discount rate, the estimation of which can have a significant impact on the valuation conclusion, is not required for an asset-based approach.
Taken collectively, however, income and asset-based valuations generally yield better valuation accuracy and more-effective analysis, which is the real benefit of a hybrid approach.

Acquisition Procedures:
- Procedure for public take over:
- Growth / expansion is decided
- Predator company appoints experts – legal consultants, banks, accountants and stock brokers
- Decision regarding contact with target firm – approach before the bid or hostile takeover
- Purchase of certain % age of shares of target
- Establish an offer and communicate target
  Includes offer document, offer validity, predator may revise offer if declined by target
- Acquisition of private company:
- Limited consultancy services from expert are required. internal evaluation is normally enough.
- Detailed investigation is conducted before the transaction.
- Offer price is negotiated by both parties
- Finalization of deal by entering into a contract
- Payment of price finishes the deal.

Anti-takeover tools:
Takeovers are not easy – there is always some opposition to takeovers by some or all of the stakeholders of target company. In this section, you will learn how to thwart a takeover attempt successfully. The following methods have been used in practical life to stop a takeover:

Poison pill:
Poison pill originally meant a *literal* poison pill (often a glass vial of cyanide salts) carried by various spies throughout history, and by Nazi leaders in WWII Spies could take such pills when discovered, eliminating any possibility that they could be interrogated for the enemy's gain. It has since become a term referring to

any strategy, generally in business or politics, to increase the likelihood of negative results over positive ones for anyone who attempts any kind of takeover.

Pac-Man:
The **Pac-Man defense** is a defensive option to stave off a hostile takeover. It is when a company that is under a hostile takeover acquires its would-be buyer.
The most quoted example in U.S. corporate history is the attempted hostile takeover of Martin Marietta by Bendix Corporation in 1982. In response, Martin Marietta started buying Bendix stock with the aim of assuming control over the company. Bendix persuaded Allied Corporation to act as a "white knight," and the company was sold to Allied the same year. The incident was labeled a "Pac-Man defense" in retrospect. The name refers to when Pac-Man, the star of the videogame of the same name, turns around and devours the ghost that was previously pursuing him (after eating a Power Pill that allows him to do so). The term (though not the technique) was coined by buyout guru Bruce Wasserstein.

White knight (business)
In business, a **white knight** may be a corporation, a private company, or a person that intends to help another firm. There are many types of white knights.
The first type refers to the friendly acquirer of a target firm in a hostile takeover attempt by another firm. The intention of the acquisition is to circumvent the takeover of the object of interest by a third, unfriendly entity, which is perceived to be less favorable. The knight might defeat the undesirable entity by offering a higher and more enticing bid, or strike a favorable deal with the management of the object of acquisition. In short, if Company T (target) is going to be acquired by Company H (hostile firm), but Company A (acquirer) can acquire ownership of Company T, and then Company A would be acting as the white knight.
The second type refers to the acquirer of a struggling firm that may not necessarily be under threat by a hostile firm. The financial standing of the struggling firm could prevent any other entity being interested in an acquisition. The firm may already have huge debts to pay to its creditors, or worse, may already be bankrupt. In such a case, the knight, under huge risk, acquires the firm that is in crisis. After acquisition, the knight then rebuilds the firm, or integrates it into itself

Disposal of Key Assets:
Disposal of key assets is also very important tools which go in anti, because some times vital assets when go to liquidate or companies go to amalgamate then, too many hurdles come in order to process the disclosure of the assets, because investment made by the investor.

Acquisition by the Target:
A **targeted repurchase** is a technique used to thwart a hostile takeover in which the target firm purchases back its own stock from an unfriendly bidder, usually at a price well above market value.

Politics
Political pressure is an effective anti-take over tool. Two good examples will make you understand better how a government can stop takeover bid.
DWP – Middle East based port company acquired the management of some US ports after successful bidding. Later, as the congress raised concern about the security of its ports, US president had to interfere to stop this bid. On the same lines, an Indian business tycoon had a successful bidding of a French steel manufacturer but later French government intervened and cancelled the bid.
A poison pill may also be used in politics such as attaching an amendment so distasteful to a bill that even the bill's supporters are forced to vote against it. This manipulative tactic may be intended to simply kill the bill, or to create a no-win situation for the bill's supporters, so that the bill's opponents can accuse them of voting for something bad no matter what. This is sometimes known as a "wrecking amendment".

LESSON 36

CORPORATE RESTRUCTURING

This handout will take care of following topics:

- Corporate Restructuring
- Divestment
- Purpose of divestment
- Buyouts
- Types of buyouts
- Financial distress – introduction

Corporate Restructuring

Corporate restructuring and improved corporate governance are essential parts of economic reform programs under way in many countries. How can corporations be restructured to promote growth and reduce excessive debt without placing undue burdens on taxpayers? What framework is needed to promote better corporate governance?

CORPORATE Restructuring involves restructuring the assets and liabilities of corporations, including their debt-to-equity structures, in line with their cash flow needs to promote efficiency, restore growth, and minimize the cost to taxpayers. Corporate governance refers to the framework of rules and regulations that enable the stakeholders to exercise appropriate oversight of a company to maximize its value and to obtain a return on their holdings. Both corporate and financial sector restructuring are central to ongoing reform programs in East Asia. This article focuses on reform efforts in Indonesia and Korea, as well as Malaysia and Thailand.

Corporations, government, and banks have close relationships in many East Asian countries. Conglomerates controlled by a small group, nontransparent accounting, interlocking ownership between the corporate and financial sectors, and weak minority shareholder rights dominate many sectors of their economies. It is estimated that the top 10 families in Indonesia in 1997 controlled corporations worth more than half the country's market capitalization. Comparable figures are one-half in Thailand, one-fourth in Korea and Malaysia, but only 2–3 percent in Japan. Fundamental cultural and institutional changes are required if a new corporate governance structure is to be established with arm's-length, transparent relations between corporations, government, and banks. Changing corporate governance, however, is a long-term process. In East Asia, the immediate task is to deal with the present crisis by undertaking integrated restructuring of the assets and liabilities of highly indebted firms, external debt restructuring, and financial sector reform. Integrated restructuring of both corporate assets and liabilities is required if competitive enterprise and financial sectors are to be developed, the risk of crises recurring is to be reduced, and the cost to taxpayers of accomplishing these goals is to be minimized.

Build up of vulnerabilities in the corporate sector. Before the crisis hit, many East Asian corporations expanded into sprawling conglomerates making extensive use of debt, because equity markets were undeveloped and, in many cases, owners preferred to retain control of firms with concentrated holdings. There were also structural weaknesses in these countries' banking supervision systems and internal bank management. Much of the debt owed to banks and corporations was unheeded and short term, which led to extreme over indebtedness following the devaluations and high interest rates of 1997 and 1998. Two factors that make financial crises in East Asia difficult to manage are the large, short-term internal and external debts and openness of many East Asian economies, both of which constrain their monetary and exchange rate policies.

Need for a comprehensive approach. Resolving corporate sector, financial sector, and external debt problems requires a comprehensive and integrated approach. Since good firms are necessary if an economy is to have good banks, corporate restructuring must be linked to bank restructuring, which, in turn, must be linked to the settlement of external debt problems. Perverse incentives and inequitable burden sharing can result if obligations to short-term external creditors are met and losses are concentrated on the government, labor, and, ultimately, the taxpayers. The costs to the government of bank recapitalization are high—we estimate that they range between 15 and 35 percent of GDP for the four countries discussed in this article. Financing these costs domestically is likely to increase government borrowing, thus increasing interest rates and further slowing recovery of the corporate sector.

In the short term, there is an urgent need to restructure the corporate and financial sectors. It is important

government, corporations, and banks. Necessary steps include broadening the ownership of corporations by liberalizing foreign entry and expanding the role of capital markets. Protecting shareholder rights and developing improved accounting standards and bank regulations are essential. Just as the Great Depression led to legislation and reforms in the United States that diminished "relation-based" finance and laid the foundation for a modern financial structure, so the crisis in East Asia offers a rare opportunity for countries in that region to lay the foundation for a new, arm's-length system that is likely to be more efficient and sustainable.

The challenge for policymakers is to undertake comprehensive reform that maintains pressure on all parties in a way that promotes equitable burden sharing among borrowers, equity holders, the government, and external creditors; restores credit to viable enterprises and confidence in the financial system; and leads to a competitive corporate and financial system that minimizes the chances of recurrence of a crisis.

Sustainable reform and the resumption of growth require a fair sharing of the burdens of economic restructuring among external participants (short-term creditors, equity holders, and bondholders) and internal participants (shareholders, workers, and taxpayers). This burden sharing needs to be seen within the context of creating a future structure in which arm's-length relations prevail between new private sector owners, the government, sound financial institutions, and the broader capital market. The present constraints of meeting external debt payments and tight capital- adequacy ratios effectively determine the extent, pace, and costs (and, to a large extent, who bears these) of corporate and bank restructuring.

Framework for Corporate Restructuring

Corporate and financial restructuring takes time. In order to avoid an unnecessarily long period of uncertainty and slow growth, however, a country's government needs to enhance efforts to resolve these systemic problems. A comprehensive approach requires an active government that will eliminate obstacles to restructuring; facilitate both formal and informal debt workouts; and establish an effective new legal, regulatory, accounting, and institutional framework.

Obstacles to restructuring that need to be eliminated include tax policies that impede corporate reorganizations, mergers, debt-for-equity swaps, or debt forgiveness; restrictions on foreigners' participation as holders of domestic equity and investors in domestic banks; labor laws and other existing laws and regulations that could hinder debt restructuring; and ineffective bankruptcy procedures.

Effective bankruptcy procedures, which can be legally enforced and serve as part of a country's debt-restructuring process, are a very important means of ensuring that unviable firms do not continue to absorb credit. An effective bankruptcy system also serves to maximize the value of the assets to be distributed to creditors. Moreover, the presence of an effective bankruptcy system will create the appropriate incentives for creditors and debtors to reach out-of-court settlements. Given the costs and risks associated with even the most developed bankruptcy systems, a policy framework that facilitates out-of-court settlements that are fast, fair, and acceptable is essential.

Experience in several countries demonstrates that the government can play a constructive, yet informal role in facilitating an orderly workout of debts (sometimes referred to as the "London approach"). This approach, used in the United Kingdom since 1989, has been designed to help bring together debtors and creditors and facilitate negotiations. Many East Asian countries have adopted, or are adopting, a similar framework to facilitate and encourage corporate restructuring that includes using new bankruptcy provisions as an incentive for creditors and debtors to negotiate.

The government's policy framework should minimize costs to taxpayers. Because its primary focus is likely to be on large and medium-sized corporations, neither direct nor should indirect subsidies be provided to them. Small and medium-sized businesses require a different approach than large ones. Because many of the former have only restricted access to banks and capital markets, it is important to have policies in place that allow for rolling over their working capital and trade credit.

Policies are also needed to improve the competitiveness of the private sector. Competition policies that reduce anticompetitive practices and stop large firms' abuses of market power need to be implemented in parallel with corporate restructuring.

Approaches to Corporate Restructuring

Indonesia, Korea, Malaysia, and Thailand have all adopted an approach that facilitates and encourages corporate restructuring and have moved to eliminate obstacles to restructuring. The extent of progress and the degree of government involvement differ among countries, however, and are influenced by the share of

estate, commodity production, or manufacturing). In Indonesia, foreign private banks hold two-thirds, and domestic private banks hold about one-third, of corporate debt. In Thailand, foreign private banks hold about one-half the corporate debt. In Korea, most corporate debt is owed to domestic banks; similarly, in Malaysia, domestic banks hold about 90 percent of corporate debt.
In Indonesia, most corporate debt is owed directly by the borrowing firms to foreign banks. The weak domestic banks and their small share of total corporate debt imply that foreign banks will be an important player in the process. The authorities have adopted a three-pronged restructuring approach that consists of a framework to facilitate workouts on a voluntary basis, an improved bankruptcy system, and provision of foreign exchange risk protection once a restructuring agreement is reached. To support this process, the authorities are also eliminating regulatory obstacles to corporate restructuring.

Divestment

In finance and economics, **divestment** or **divestiture** is the reduction of some kind of asset, for either financial or social goals. A divestment is the opposite of an investment.

Divestment for Financial Goals

Often the term is used as a means to grow financially in which a company sells off a business unit in order to focus their resources on a market it judges to be more profitable, or promising. Sometimes, such an action can be a spin-off. A company can divest assets to wholly owned subsidiaries.
Either the prime objective for divestment may be the assets being sold does not conform to the overall business strategy or they fail to meet the group hurdle rate. They are often a cheaper and cleaner alternative than closure of the unit.
It is very important to calculate the financial effect of divestment before any final decision is made based on the two aspects stated above. The evaluation will take the form of a comparison of the potential price available for the relevant business unit and the financial effect on the remainder of the group, against the financial return available from the business unit if it were retained. The divestment decision should only be made if the returns of the business unit as retained as compared with the disinvestment opportunity cost.
For example, if a division of a group is earning 12% as compared to group return of 18%, then it should be disposed off.
However, the cost of asset and price available for sale must be compared and evaluated before the decision to sell.

For example, if an asset or group of assets costing Rs 100,000 is earning 12% or 12000 and could be sold for 60,000/-. The group hurdle rate is 18%. Comparing 12,000 with 80,000, then ROCE is 15% (12,000/80,000) and is under group hurdle rate of 18%, therefore, it can be disposed off.
However, if the offer price of asset in question is 50,000, the ROCE is 24%, which is well above the group's rate of return of 18% and the asset in question should not be disposed off.

Divestment for Social Goals:

Although these types of divestments are for social purposes, yet they have financial repercussions. The term also refers to the reduction of investment in firms, industries or countries for reasons of political or social policy.

Examples

Examples of divestment for social reasons have included:

- The withdrawal of firms from South Africa during the 1980s due to Apartheid
- Discussion over whether it is ethical to invest in companies that sell tobacco

Definition of buyout

Buyout is defined as the purchase of a company or a controlling interest of a corporation's shares or product line or some business. A leveraged buyout is accomplished with borrowed money or by issuing more stock.
The purchase of a company or a controlling interest of a corporation's shares.

Management Buyouts

Management buyouts are similar in all major legal aspects to any other acquisition of a company. The particular nature of the MBO lies in the position of the buyers as managers of the company and the practical consequences that follow from that. In particular, the due diligence process is likely to be limited as the buyers already have full knowledge of the company available to them. The seller is also unlikely to give any but the most basic warranties to the management, on the basis that the management knows more about

the company than the sellers do and therefore the sellers should not have to warrant the state of the company.
In many cases, the company will already be a private company, but if it is public then the management will take it private.

Reasons for Buyouts:

The existing parent company of the victim firm may wish to dispose of it. The parent company may be caught up in financial distress and is in acute need of cash and liquidity. The subsidiary on the other hand, is not strategically fit with parent's overall business strategy.
In case of loss making, selling the unit to its management may be the better option than to dispose or putting into liquidation, which has it own costs.
The purpose of such a buyout from the managers' point of view may be to save their jobs, either if the business has been scheduled for closure or if an outside purchaser would bring in its own management team. They may also want to maximize the financial benefits they receive from the success they bring to the company by taking the profits for themselves.

Private Equity Financing

The management of a company will not usually have the money available to buy the company outright themselves. While they could seek to borrow from a bank if the bank accepts the risk, they will commonly look to private equity investors to back their buyout. They will invest money in return for a proportion of the shares in the company, and sometimes also grant a loan to the management.
Private equity backers are likely to have somewhat different goals to the management. They generally aim to maximize their return and make an exit after 3-5 years while minimizing risk to them, whereas the management will be taking a long-term view. While certain aims do coincide - in particular the primary aim of profitability - certain tensions can arise. The backers will invariably impose the same warranties on the management in relation to the company that the sellers will have refused to give the management. This "warranty gap" means that the management will bear all the risk of any defects in the company that affects its value.
As a condition of their investment, the backers will also impose numerous terms on the management concerning the way that the company is run. The purpose is to ensure that the management runs the company in a way that will maximize the returns during the term of the backers' investment, whereas the management might have hoped to build the company for long-term gains. Though the two aims are not always incompatible, the management may feel restricted.

Leveraged Buyout – LBO

The acquisition of another company using a significant amount of borrowed money (bonds or loans) to meet the cost of acquisition. Often, the assets of the company being acquired are used as collateral for the loans in addition to the assets of the acquiring company. The purpose of leveraged buyouts is to allow companies to make large acquisitions without having to commit a lot of capital.

In an LBO, there is usually a ratio of 90% debt to 10% equity. Because of this high debt/equity ratio, the bonds usually are not investment grade and are referred to as junk bonds. Leveraged buyouts have had a notorious history, especially in the 1980s when several prominent buyouts led to the eventual bankruptcy of the acquired companies. This was mainly due to the fact that the leverage ratio was nearly 100% and the interest payments were so large that the company's operating cash flows were unable to meet the obligation. It can be considered ironic that a company's success (in the form of assets on the balance sheet) can be used against it as collateral by a hostile company that acquires it. For this reason, some regard LBOs as an especially ruthless, predatory tactic.

Employee Buyout – EBO

A restructuring strategy in which employees buy a majority stake in their own firms. This form of buyout is often done by firms looking for an alternative to a leveraged buyout. Companies being sold can be either healthy companies or ones that are in significant financial distress.
For small firms, an employee buyout will often focus on the sale of the company's entire assets, while for larger firms; the buyout may be on a subsidiary or division of the company. The official way an employee buyout occurs is through an employee stock ownership plan (ESOP). The buyout is complete when the ESOP owns 51% or more of the company's common shares.

Management Buy In (MBI):

team often competes with other purchasers in the search for a suitable business. Usually, a manager will lead the team with significant experience at managing director level.
The difference to a management buy-out is in the position of the purchaser: in the case of a buy-out, they are already working for the company. In the case of a buy-in, however, the manager or management team is from another source.
Some of the private equity groups and executive search firms that focus on management buy-ins.
Spin out
To rotate out of control, as a skidding car leaving a roadway.

Factors to be considered in Management Buyout
A management buyout occurs when incumbent **management** takes ownership of a firm by purchasing a sufficient amount of the firm's **common stock.** These transactions vary due to the conditions under which the firm is offered for sale and the method of financing employed by the managers.
Consider the conditions that may encourage managers to purchase a controlling interest in the firm's stock. The owners of a corporation are its stockholders. These stockholders are concerned with increasing the value of their investment, not only in one specific firm, but for all investments. Therefore, if a majority of the firm's stockholders perceive that the value of their investment will be enhanced by agreeing to be acquired by another firm, they will elect to sell their stock to the acquiring firm at a price they consider fair. Managers of a firm may consider this transfer of ownership a benign event. They may also, however, be concerned that the new owners will not manage the firm most efficiently, that they will have less control over the management of the firm, or that their jobs will be less secure. In this situation, the current managers of the firm may consider purchasing the firm themselves.
Another situation that frequently leads to management buyouts is the case of financial distress. If the firm is having serious difficulties meeting its financial obligations, it may choose to reorganize itself. This can be done by closing failing operations to slow the drain on financial resources and by selling profitable operations to an outside party for the cash needed to restore financial viability to remaining operations. It is not uncommon for firms in this situation to give managers of the divisions being divested the opportunity to buy the assets. This makes sense for two reasons. First, management probably has the greatest expertise in managing the subset of assets offered for sale. Second, it saves the cost of searching for an external party with an interest in the division, for sale.
Once incumbent management has decided it is interested in purchasing the firm or a particular portion of the firm, they must raise the capital needed to buy it. Managers in many corporations are encouraged to become stockholders in the firm by including stock and the option to buy more stock as part of their compensation package. The non-management stockholders, however, will expect some compensation from this sale and the value of manager-owned stock is not likely to be sufficient to finance the purchase of the firm or one of its divisions. This means that managers must raise cash from other sources such as personal **wealth.** If managers have sufficient capital in other investments, these can be sold and used to finance the remainder of the purchase price.
While a management buyout is relatively straightforward when managers have sufficient personal capital to meet the purchase price, the more common scenario requires managers to borrow significant amounts. It is not un-common for managers to **mortgage** homes and other personal assets to raise needed funds, but in many transactions, these amounts are still not sufficient. In these cases, managers will borrow larger amounts using the assets of the firm they are acquiring as collateral. This type of transaction is called a **leveraged buyout,** or LBO. The LBO is a common form of financing for large transactions. It provides the management team with the financing needed to control the assets of the firm with only a small amount of equity. Nevertheless, the new firm that emerges from this transaction has very high financial risk. The large amounts of **debt** will require large periodic payments of interest. If the firm cannot meet this obligation during any period, it can be forced into bankruptcy by the debt holders.
This description of a management buyout can be generalized to define an employee buyout. In some situations, it is feasible that all employees, not just a small group of managers, can collectively purchase a controlling interest in a firm's stock. This may be the long-term result of a carefully designed employee stock ownership plan (ESOP), that management has instituted. It may also result from the pressures of financial distress. In 1994, United Airlines was faced with declining profits and strained relations with labor. Management and labor eventually agreed on a swap of wage concessions for a 55 percent equity stake in the firm. In the five following years, the firm became more profitable, the stock price rose significantly, and employees retained a controlling interest in Unity's common stock.

It is important to note that managers (or employee owners) are no different than other investors. They will assess the **risk** and rewards associated with a buyout, leveraged or otherwise, and will act in their own best interests. As managers, they have specialized knowledge of the firm that may prove advantageous in charting a future course of action for the acquired firm. By assuming ownership of the acquired firm, they will also assume a riskier position personally. If the potential rewards associated with control are perceived as adequate compensation for this risk, then the management buyout will be source of financial distress.

Sources of Financial Distress:

A situation in which available cash is insufficient to pay supplier, vendors, employees, banks and creditors is known as financial distress. Signs of first-stage distress include negative net cash flow and earnings and a falling market equity value. If this situation persists, then management must take actions to rectify it. The second-stage signs of distress include managements' attempt to reduce costs, such as employee lay off and plant closing.

If this situation goes on, the firm enters the third and final stage of distress marked by delayed and small payments to creditors and vendors, employees and others. This may also include of sale of assets, issuing loan stocks and rescheduling payment with creditors and banks. If these actions do not alleviate the financial sufferings and the firm is likely to embrace the bankruptcy – the eventual result of financial distress.

A firm incurs several costs when its financial position deteriorates, even if the firm does not declare bankruptcy. These are called costs of financial distress. Bankruptcy involves additional fatal costs. As a general definition, any loss of value that can be attributed to a firm's financial strength is a cost of financial distress. These can be classified into three categories:

- In terms of favours to stakeholders to off set them for the risk of doing business with financially sick firm
- Loss of competitive edge in product market
- Loss of tax shield available

In the next hand out we shall cover the sources of financial distress in detail.

LESSON 37

FINANCIAL DISTRESS AND FOREIGN EXCHANGE MARKET

The following topics are covered in this hand out:

- Sources of financial distress
- Effects of financial distress
- Reorganization

We can divide the sources of financial distress into three categories:

a- Firm level causes of financial distress
b- Industry level causes
c- Macro level factors causing financial distress

a. Firm Level Causes

These factors are specific to a particular firm and include i) ownership and governance, b) operating risk and c) leverage.

For example, agency costs connected with managerial discretion and debt, depending on the extent that they are not mitigated through contracting devices can affect a firm's operational efficiency, leverage, profitability and risk. However, if a firm is observed to be in financial distress, and even if the cause of the distress can be traced explicitly to bad decisions by management, it may be difficult to distinguish whether the decisions that contributed to distress are due to management's self-serving behavior or to incompetence.

b. Industry Level Causes Competition:

Five forces of industry competition are useful for identifying possible industry level causes of financial distress. These forces are 1) entry / exit barriers, 2) bargaining power of vendors 3) bargaining power of buyer 4) threat of substitute products and 5) rivalry among competing firms.

A negative shock to an industry's product demand or costs especially if it is sustained over time, will eventually force a shakeout of firms in the industry. The weakest firm will be forced into liquidation or must consider being acquired by a stronger firm in the industry.

The leverage helps boost a firm's sales growth relative to that of its industry rivals because the firm commits to aggressive competitions in the product markets, which leads less aggressive competitors to yields part of their market share. The firm may deliberately choose low leverage so as to be able to pursue predatory market strategies to squeeze a high-levered rival, perhaps to the point of bankruptcy.

The industry shocks contribute to the frequency of takeover and restructuring activity. Shocks include deregulation, changes in input costs, and innovations in financing technology that induce or enable alterations in industry structure. The inter-industry patterns in the rate of takeovers and restructurings are directly related to the economic shocks borne by the sample industries.

Financial researchers and thinkers have investigated the effect of a bankruptcy announcement by one firm on the values of other firms in the industry. There are two conflicting effects. On one hand, there may be contagion effect. The market may lower the value of other firms in the industry because the bankruptcy announcement reveals new negative information about the status of the industry as a whole. On the other hand, the market may raise the values of other firms in the industry because on of their rival has failed.

The deregulation of an industry can induce financial distress in many firms within the industry as the economic structure of the industry changes. Over the last decade, Pakistan has deregulated the transportation industry (airline and rail), communication industry and several public sector giant industries including Pakistan Steel.

c. Macro-Level Causes

Recessions create financial distress by narrowing the margin between cash flow and debt service. When the flow constraint is relevant, a principal effect of drop in current income is the reduction of expenditure on illiquid and long-lied assets. There are two reasons for this. First, lower current income increases the short run probability that the flow constraint will have to be satisfied through costly means, for example, the distress sales of assets, borrowing at unfavorable terms, sever reduction in current living standard, or as the last resort, bankruptcy. Secondly, a drop in current income typically has ambiguous implications for the consumers' estimates of future income flows and, hence, for the level of durables holdings consistent with maintenance of solvency in the long run. Because durables are illiquid, it is more costly to correct an over purchase than an under purchase. Assuming that waiting for new information will tend to resolve the ambiguity created by the initial income fall even a risk neutral consumer will be motivated to defer durables purchases until the uncertainty is resolved.

Monetary Policy: liquidity reminds us the critical role of monetary policy on the nation's overall liquidity. The state bank affects the level of aggregate liquidity primarily through its open market operations. These operations involve the SBP buying or selling T-bills and Govt. securities out of its considerable inventory, to affect its intended policy to ease or tighten liquidity in the banking system. When it buys bills, an expansionary maneuver, it adds legal reserves to the banking industry, which the nation's banks can use to create new loans on a multiplied basis. Selling bills has the opposite or contradictory effect. Short-term interest rates fall when the SBP is pursuing an expansionary policy, and rise when contradictory policy is being pursued.
The primary duty of central bank is to protect the purchasing power of rupee, while also allowing for a sustainable level of real growth in the economy. The SBP operates under the assumptions that inflation is positively related to real economic growth. On one hand, if real economic growth is weak, the state bank can pursue an expansionary policy without much concern about inflation.

On the other hand, when economy is overheated, state bank eventually steps in with contradictory policy to cool the economy and thereby reduce inflation. Of course, a consequence of contradictory monetary policy is a rise in the rates on, and tighter limits on the availability of short-term loans.

Effects of Financial Distress:

Cost associated with the entire real world factors that we have covered so far are exacerbated when a fir is operating under financial distress.
Loss of Tax Benefit: if a levered firm fails to make profits on a chronic basis, it looses the value of the tax shield provided by debt interest and depreciation. Depending on the firm's initial leverage and depreciation base, these losses alone can place the firm at a competitive and strategic disadvantage.
Transaction Costs: the cost of transacting in the financial markets is much higher fro firms in financial distress. In some cases, the capital markets may be effectively closed to a firm that is in severe distress, in part because, given the effort required by an investment bank that float the firm's equity or debt securities, the required underwriter spread would be prohibitively high.
Increase in Illiquidity: significant losses in the market value of a firm's equity can have several negative liquidity effects. First, the firm may lose some professionals who play vital role is supporting the flow of information about a stock, which is critical to liquidity. Secondly, the investors' interest in trading that stock may reduce resulting in increase in the bid-ask spread. Third, there are chances that stock exchange may de-list that stock, but this will depend on the regulations of stock exchange.
At this point, the firm has lost most of its potential to raise equity funds; raising debt funds will be more difficult as well. Moreover, this may come at a time when the firm is most in need of external funds to survive.

Capital Reconstructions:

These types of schemes can be undertaken for different purposes. We can divide them into two broad categories;

- Scheme undertaken where company is in financial distress
- Scheme undertaken where company is not in financial crisis

However, there may be a situation, which may have characteristics of both of the above situations. A company may heading towards financial distress and decides to go for reconstruction.
The firms in financial distress may undertake restructuring to improve both their mix of different types of capital and the timing of availability of funds. The main objectives of reorganization may be from the following factors. It may be a single factor or combination of several.

- To reduce the after tax cost of borrowing
- To settle the loans sooner or later
- To improve security of finance
- To improve financial image of the company
- To make company more attractive to the investors
- To cleanse balance sheet

Types of reorganization:
The following are the types of reorganizations:

- conversion of debt to equity or vice versa
- conversion of equity from one class to other
- conversion of debt from one class to another

FOREIGN EXCHANGE MARKET

Today, most of the businesses are not just conducting their trade in one currency. They have to trade in more than one currency. All the currencies except the home currency are known as foreign currencies. This is extremely large market and most of the transactions are carried out using the telecommunication technology like telephone, email, fax etc. The main market players are central banks, banks and For-ex (Foreign exchange) dealers conducting trade on behalf of their clients including business firm, governments. The existence of FX market is of crucial importance in the development of international trade that requires the use of foreign currency. FX market is very competitive as there are several buyers and sellers, standardized procedures and regulations, commodity is homogeneous and most of the times transactions are being carried out over the phone without physical participation. The prices of currencies are determined by demand and supply.

Exchange rates: an exchange rate is the price of one currency in terms of another. There are two currencies involved – a base and variable. When a FX dealer quotes in terms of Pak Rs. / US $, then he is referring the rate for the number of US $ to one Pak rupee.

For one exchange rate (Pak Rs. / US $) there are two types of rates normally quoted. That is bid and offer rate. Bid rate is lower than the offered rate.

A dealer/bank may express PKR/US$ as 60.5500 – 60.5900

Bid price – lower price, a price at which the dealer will sell the variable currency.

Offer price – higher price, a price at which the dealer will buy the variable currency.

At 60.5500, dealer will sell US $ in exchange for PKR

At $ 60.5900 dealer will buy US $ in exchange for PKR

The difference between bid and offer prices is know as spread and represents the gross margin of the FX dealer.

Spot Rates:

Foreign currencies can be traded on either spot or forward.

Trading spot means that the settlement will be now – extended to two working days after the transaction is made. Buying or selling forward means that settlement will be made at an agreed future date. Therefore, there will be different rates for spot and forward for an identical pair of currencies. Forward contracts have settlement date up to one year with exception to major currencies where it can be two years.

LESSON 38

CURRENCY RISKS

We shall cover following topics in this hand out:

- **Types Of Currency Risks**
  - Transaction exposure
  - Translation exposure
  - Economic exposure
- Methods Of Protection Against Transaction Exposure
  - Internal Methods
  - External methods

Currency Risks

We can classify foreign risk exposure into three broad categories:

- Transaction exposure
- Translation exposure
- Economic exposure

Translation Exposure:

In real world, a single transaction (sales and receipt) may take some period of time. For example, you sold goods to a foreign customer on 15 December 2005, and customer promised payment after two months. Now during these two months the exchange rate may fluctuate on either side and this will result in exchange gain or loss. These transactions may include import or export of goods on credit terms, borrowing or investing in foreign currency, receipt of dividend from foreign subsidiary. This type of exposure can be safeguarded by using hedging instruments.

Translation Exposure:

When a business has several subsidiary located in different foreign land, then it needs to consolidate its financial results of overall operations. Translation exposure effects the financials of the group when it translates its assets, liabilities and income to home currency from various currencies.

The widely used mean of protecting against translation exposure is known as balance sheet hedging. In this method, assets and liabilities are matched of offset in order to reduce the net effect of translation. For example, a company may try to reduce its foreign currency dominated assets if it fears a devaluation of foreign currency. At the same time, it may increase its liabilities by seeking loans in the local currency and slowing down payment to creditors. The firm may try to equate its foreign currency assets and liabilities then it will have no net exposure to change in exchange rates.

Economic Exposure:

This type of exposure affects the value of the company. Any adverse exchange rate fluctuation will reduce the present value of all the future cash flow, thus reducing the value of the company. It is difficult to measure the dollar value effect on the value of the firm.

For instance, a Pakistani firm is operating in other country through a subsidiary. Assuming that the foreign country in question devalues it currency unexpectedly, this will be a bad happening for the home firm. This is because every local currency unit of profit earned would now be worthless when repatriated to Pakistan. On the other hand, if could be a good news as the subsidiary might now find it profitable to export goods to the rest of the world.

If a firm manufactures all its products in one country and that country's exchange rate strengthens, the firm will find its export expensive to the rest of the world. Sales will be stagnant if not lowering and the cash flow and value of the firm will also deteriorate.

On the other side, if a firm has decentralized production facilities around the world and bought its inputs from all over the world, it is unlikely that the currencies of all its operations would revalue at the same time. It would therefore, find that although it was losing exports from some of its productions facilities, this would not be the case in all of them.

When borrowing in more than one currency, firms must be aware of foreign exchange risk. Therefore, when a firm borrows in US dollars it must settle this liability in the same currency. If US $ then strengthens against the home currency this can make interest and principal repayments far more expensive. However, if borrowing is spread across several currencies it is unlikely they will all move in one direction – upward or

downward and economic exposure is reduced to considerable extent. Borrowing is foreign currency is justified if returns will then be earned in that currency to finance repayment and interest.

Protection against Transaction Risk

Fluctuations in foreign exchange market do not stop. A company may have several thousand foreign currency units in payable and receivable transactions. Such payments and receipts are going to take place in future thus exposing a company to adverse fluctuations, resulting in exchange losses.

For example, a Pakistani enterprise is required to make US $ 100,000 to a US exporter within two months time. The company anticipates that dollar will strengthen against the local currency (or local currency will weaken against the US $), it means that Pakistani firm will need to spend more local currency units to buy the dollars in question. This type of risk can be reduced if not eliminated, by hedging.

There are two types of measures that can reduce the transaction exposure. These are:

Internal methods:

- Invoicing in home currency
- Leading and lagging
- Multilateral netting

External methods:

- Forward contract
- Money market hedges
- Currency futures
- Currency options
- Currency swaps

Internal methods:

Invoicing in home currency

This will eliminate the need of exchange of currency upon receipt. However, the seller would be compelled to revise its prices periodically.

Seller can invoice:

- In home currency
- Currency that is stable than home currency
- Currency with a positive forward markets

Buyer's preferable currency is:

- Own currency
- Stable than own currency
- Currency he has
- Currency of the industry

Leading & lagging:

- Leading refers to making payment before falling due.
- Lagging means to defer or delay the payment or settling the payment well past due date

If the currency of payer is weakening against the other currency (of buyer) than it is beneficial to pay early. For example, if a Pak importer need to pay for import bill and predicts that Pak rupees will weak against the dollar in future, then it is advisable to pay as early as possible.

However, if Pak rupee is foreseen strengthening against dollar, then delaying payment would be financially advantageous.

These issues are from payer's standpoint and will be opposite for payee.

Matching of receipts and payments:

For-ex exposure can be partially hedged by matching payments and receipts of same currency.

For example, a company will receive US $ 1 million during the next quarter and will need to pay US $ 1.2 million in the same period, and then the net exposure will be US $ 200,000/- as 1 million payments and receipt are net off.

Matching receipts and expenditures is a very useful way of hedging currency exposure. It can be organized at group level by the finance department so that currency income for one of the group companies can be matched with the expenditure of another company. In order to reduce the transaction exposure to maximum level, it is of immense importance that forecast of amount and timings of foreign currencies are reliable.

External Hedging Methods:

Forward Rate Agreements:

Under this method, hedging refers to making an investment to reduce the risk of adverse price movements in an asset. Normally, a hedge consists of taking an offsetting position in a related security, such as a futures contract.

Using this method, we can fix the exchange rate now for a future transaction of the needed currency. Because spot rates are changing every day and fixing the exchange rate for future date 'now' reduces the risk to significant extent.

A forward contract is binding upon both the parties – currency dealer and a company/client. This means that both parties must honor their commitment to sell or buy the foreign currency on the specified date and amount. By hedging against the risk of an adverse exchange rate movement with a forward contract, the company also closes an opportunity to benefit from a favorable change in the spot rate.

Hedging is based on the assumption or estimate that it will be expensive to pay US $ in three months time because of the fact the PKR will be weakening against US $. Therefore, a company enters into a contract to buy x dollars after 3 months at an exchange rate of Rs 60/ US $ decided now. At the maturity date both parties have to honor their respective commitments of buying and selling of US $ at agreed rates.

Now if on the maturity date, the spot ex rate is Rs 61/US $, (PKR weakened against US $), then the company has actually eliminated the loss and benefited financially.

However, if the spot rate on maturity date is Rs. 59/US $, (contrary to its estimation of weak local currency, local currency strengthened) then the company has missed the opportunity to benefit from this favourable sport rate.

For best results, one must possess the knowledge of Forex market with a vision of future to estimate that which currency will weaken against which other one.

Timing of cash flow is of crucial importance in hedging contract.

Money Market Hedging:

Money markets are wholesale (large-scale) markets for lending and borrowing of money for short term. Bank are major player of money markets and companies seek their services to hedge against the ex rate fluctuations in short term.

As forward ex rate (which is agreed now) is derived from sport rates using interest rates, a money market hedge can produce the same results as of forward contract.

There will be two situations:

- A company is to receive money in foreign currency (FCY) at a future date and will exchange it into local currency, and
- A company needs to pay foreign currency (FCY) at some future date and will use local currency to buy the FCY to make payment

Scenario: Future Income in FCY

What is needed at this point is to fix the exchange value of the future currency income.

A hedge will be created by fixing the value of income now in local currency.

We can do it:

Borrow now in foreign currency (the same that the company will receive in future). The maturity of both – loan and receipt should be the same.

The loan + interest on FCY loan should equal the amount of FCY future receipt.

When the FCY receipt hit the account, loan will be paid off.

The FCY loan can be converted to local currency immediately and may be put to a short-term deposit to earn interest.

LESSON 39

CURRENCY RISKS

We shall take care of following topics in this hand out:

- Future payment situation – hedging
- Currency futures – features
- CF – future payment in FCY

Money Market Hedge – future FCY payment scenario

A similar approach will be taken to create the hedge when a firm is expecting to pay in FCY in future. In this scenario, a hedge can be created by exchanging local currency for FCY now using spot rates and putting the currency on deposit until the future payment is to be made. The amount borrowed and the interest earned on the deposit should be equal to the FCY. If it is not the case then it will not be a clean hedge. The cash flows are fixed because the cost in local currency is the cost of buying FCY on spot rates that was put under a deposit.

Mechanism:

Step 1: determine the FCY (assume US $) amount to be put to a deposit that will grow exactly to equalize the future payment in dollars. You need to calculate this using the available spot rates and interest rate on dollar deposit.

Step 2: in order to deposit dollars in interest bearing account, the company will buy dollars at spot rates.

Step 3: the company will borrow local currency for the period of hedge.

These steps will ensure that the hedge created a definite cash flow regardless of exchange rate or interest rate fluctuations. The exchange rate has been fixed.

Currency Futures:

A currency future is a standard contract between buyer and seller in which the buyer has a binding obligation to buy a fixed amount, at a fixed price and on a fixed date of some underlying security.

Fixed amount = contract size
Fixed date = delivery date
Fixed price = future price

Futures are forward contracts traded on future and option exchanges. There are several such exchanges around the world and although some trade in similar forward contracts, as a general rule each exchange specializes in its own future contracts. This means that if a company wants of trade in future contracts it has to go to exchange where those contracts are traded.

Futures are only traded on exchanges using standardized contracts. Each future contract is in particular item having identical specification. For example, every sterling contract has same specification.

Settlement of future contracts is made at predetermined times during a year. These are usually in March, June, September and December each year. This means, for example, that sterling future contracts are traded on the exchange for settlement in these months.

Futures are traded at a price agreed between the buyer and the seller. This price reflects the price of the item traded by the contract.

Most of the futures do not run to their final settlement date. These contracts may be cash settled or physical delivery settled. With cash settlement, there is payment in cash from one party to the other. With physical delivery, the underlying item is delivered by one party to other.

When a trader buys future, this represents taking a long position in futures. Such a trader having a long position can close his position at any time before the settlement date by selling the same number of contracts.

On the other side, when a trader is selling futures then it represent his or her short position. It is possible to sell future even you don't have them. A trader who is in short position can close her position by buying the same number of future before the final settlement date.

Ticks:

A tick is the minimum price movement of a contract. For example, the movement in US$ / PKR rate from 60.1501 to 60.1505, means the rate has risen four ticks. Every tick movement in price has same money value. For example, sterling/us$ contract standard size is sterling 62,500/-. The price is in us$ and tick size is $ 0.0001, which means each tick value is $ 6.25. If a trader is holding a long position and price of future increases, then there's profit and fall in value represents loss. If trader is holding is short position, rise in future value represent a loss, fall in price profit.

Like forward contracts, currency futures have also two-scenario: receipt of FCY and payment involving FCY.

Currency Market Hedging – FCY payment in future:

A company might have an exposure to a future payment in a foreign currency. It can hedge the exposure by arranging to buy the currency forward using futures.

When the payment is actual made, the currency to make the payment should be purchase spot. The futures position should be closed. If there is a gain on the future position, this might be used to make some of the payment.

Example – currency futures –

Scenario - future payment in FCY

A Pak company bought goods for $ 900,000/- in December and needs to settle in May. Due to the sensitivity of exchange rate of $/PKR the company intends to hedge this transaction exposure with currency futures. The spot rate when the goods were purchased was us$ 1 = PKR 60.1559. The $/PKR May futures contract is currently priced at us $ 1 = PKR 60.1585.

Assuming that the spot rate when goods are paid is US$ 1 = PKR 60. 2171 and June futures is priced at us$ 60.2201.

How can company hedge this transaction with currency future?

	US $	**900,000.00**		
SPOT RATE DECEMBER	**PKR**	**60.1559**		
FCY FUTURE - DEC	**PKR**	**60.1585**		
SPOT RATE JUNE	**PKR**	**60.2171**		
FCY FUTURE - JUNE	**PKR**	**60.2201**		
BUY IN DECEMBER AND WILL SELL IN JUNE.		**PKR/$**	**US$**	**PKR**
DECEMBER - FCY FUTURES PURCHASED		**60.1585**	**900,000.00**	**54,142,650.00**
IN MAY - WHEN PAYMENT WILL BE MADE IN US $		**60.2201**	**900,000.00**	**54,198,090.00**
GAIN ON SALE OF FCY CONTRACTS				**55,440.00**
MAY				
- NEED TO BUY US $ AT SPOT RATES TO MAKE PAYMENT		**60.2171**	**900,000.00**	**54,195,390.00**
LESS: PROFIT / GAIN ON FCY FUTURES				**(55,440.00)**
NET COST				**54,139,950.00**
EFFECTIVE EXCHANGE RATE		**54,139,950.00**	**900,000.00**	**60.1555**

LESSON 40

INTEREST RATE RISK & FORWARD RATE AGREEMENTS

Following topics have been considered in this hand out:

- CF – future receipt in FCY
- Forward contract vs. currency futures
- Interest rate risk
- Hedging against interest rate
- Forward rate agreements
- Decision rule

CF – Future Receipt in FCY

When a firm is expecting a FCY receipt in future, the risk, contrary to payment scenario, is the fall in the exchange rate below the current spot rates. A hedge would be to sell the FCY future today and the position will be closed by buying the futures in future – when FCY receipt is expected. However, you must remember that currency futures are settled on specified dates during a year. So the time factor should also be considered.

Once the hedge has been established, if the spot rate moves adversely up to the time the currency is received, the loss from adverse spot rate movement will be off set by gains on future trading.

On the other side, if spot rate moves favorable to the time currency is received, the profit from favorable movement in spot rate will be reduced by the amount of loss on future trading.

Future contracts do not provide perfect or clean hedge normally. The reason is that contract size normally does not equalize the FCY involved.

The first step, in establishing hedge, would be to work out the contracts needed to hedge the currency exposure. This can be computed by dividing currency involved by the contract size. As stated above the number of contracts should be in whole number, which will not result in clean hedge.

Then, once the number of contracts that have been sold (in this scenario) there will be a pause until the time position is closed. If the spot rate has weakened or strengthened, calculation will be made to find out the net gain or loss of the hedge.

It would be much helpful in understanding this concept by looking at the following example:

Note: this example has been especially constructed in foreign currencies – US$ & GBP, due to the reason that currency future are not available in Pak rupees. This is again being done to aid your understanding of international business environment.

In January, a UK company sold goods to a US customer and later promised to pay after 3 months. The total value of goods is US$ 1,202,500.00. The current spot rate for GBP/US$ is $1.5000 and early April GBP future contract are being traded at $1.4800 on a contract size of GBP 62,500.

UK supplier is exposed to exchange risk on future income of $1,202,500.00. If sterling weakens, UK trader will gain but if sterling strengthens, he will lose.

The UK supplier can set up a futures position by hedging the risk of strengthening of sterling or weakening of US$.

To do this the UK seller will sell US$ using sterling futures. A sterling future is for GBP 62,500/- and the buyer of the sterling future is buying sterling or selling US$

Buyer needs to buy sterling future.

At the future price of $1.4800 the $ receipt after 3 months will be worth:

= $1,202,500.00 /1.4800 = GBP 812,500

The UK trader needs to buy:

812,500 / 62,500 per contract = 13 contracts

The overall financial position will be:

Income from trading		$ 1,202,500/=
Profit on future selling:		
400 ticks x 6.25 x 13	=	$ 32,500/=
Total value	=	$ 1,235,000/=

Exchange into sterling at spot rate of $1.52/GBP:

$1,235,000/1.52 = GBP 812,500

Effective ex rate is

$1,202,500 / 812,500 = $1.48

Forward contract vs. Currency future

In currency futures, commodity exchanges are involved and credit risk is eliminated. However, a forward contract is made between parties and each party needs to confirm the credit worthiness of each other.
Reversal of currency future is very simple. Large buyers and sellers exist. Reversing forward contract is difficult. Original parties have to set off the deal. Future currency contract become a "commodity" and reversing does not require original parties.
Size of contract: no size restriction is placed in forward contract and is up to parties to deal or contract in the magnitude they like. However, in future currency contract the size is pre-determined or fixed. In this scenario, perfect hedge is not possible.
In forward contract, no margin is required but in currency future parties have to put an initial margin.

Interest Rate Risk Management:

Apart from exchange rate fluctuations, another source of risk in foreign exchange market is interest rate risk.
It is the risk of incurring losses or gains due to adverse / favorable movements in interest rates.
For example, a firm is expecting FCY receipts / payment and this income/payment will depend on interest rate at that time.
The firm's assets (some) whose value is sensitive to interest rates.
Firms and companies dealing in money market hedges are the most effected by the interest rate variations.
Most of banks and financial institutions have significant exposure based on short-term floating interest rates.
For example, some large companies have forecasts of receiving handsome amounts of cash, or have forecasted surplus cash in short term. Income from short-term investments will be dependant upon the interest rates and if the short-term interest rates are falling then there will be a loss in terms of lower interest income from investment.
The other side, if a company is planning to borrow at variable rate of interest, the interest amount charged each time varying according to whether short-term interest rates have risen or fallen since the previous payment.
To quote another example how interest rate fluctuations affect the financials of the company, a company may have invested in bonds and any change in interest rate will affect the value of investment in balance sheet.
Examples of interest rate risk – short term investments, investment in bonds, borrowings in short term – variation in short term interest rate.
Interest rate risk is higher when interest rates are extremely sensitive and their future direction is unpredictable.
Hedging against the interest rate risk
1) Forward rate agreements
2) Interest rate futures
3) Interest rate options
4) Interest rate swaps
We shall discuss these individually.

Forward Rate Agreements – FRA

This is a contract and a financial instrument that is used has hedge against interest rate adverse fluctuations on deposit or loans starting in near future. This resembles to forward exchange rate agreements to fix the exchange rates.
Features of FRAs:
It is between a bank and a client for fixing future interest rate on notional amount of loan or deposit. The loan or deposit is for a stated period starting on a specified time in future.
The size of the notional loan or deposit is agreed between the bank and the client.
FRAs are cash settled.
At settlement date buyer and seller must settle the contract.
The FRA rate for three months loan/deposit starting in a 6 months time is normally expressed as 6v9 FRA.
The buyer of a FRA agrees to pay fixed interest rate (FRA rate) on notional loan/deposit. At the same buyer will receive interest on notional loan/deposit at benchmark rate of interest.
On the other side, seller of FRA agrees to pay interest on the notional amount at benchmark rate and receives interest at a fixed rate.

Decision Rule:

When a FRA reaches its maturity – the settlement date, both the seller and buyer must settle the contract. If the fixed rate in the agreement is higher than the reference rate (may be KIBOR), the buyer of the FRA makes a cash payment to the seller. The payment is for the amount by which the FRA rate exceeds the reference rate.

If the fixed rate in the agreement is lower than the reference rate, the seller of the FRA makes a cash payment to buyer – exactly the reverse of above. The payment is for the amount by which the FRA rate is less than the reference rate.

FRA offer companies the facility to fix future interest today either on short-term borrowing or deposit for an agreed future period. An effective interest rate can be fixed on future short-term borrowing by buying an FRA. Alternatively, an effective interest rate can be fixed on short-term deposit or investment by selling FRA.

Mechanism:

Step 1: Understand the scenario confronted to the company. This means that weather the company plans to borrow or will have surplus cash to invest. The hedge will depend on that scenario. If the company plans to borrow in future then it will need to buy FRA and if company intends to put some investment in short term deposit, it needs to sell FRA.

Step 2: The bank or some vendor will be identified who trades in FRAs and terms are negotiated. Terms generally include the duration of notional deposit, amount of notional deposit and rate.

Step 3: On the settlement date, there will be cash payment / receipt from/to bank to company based on the prevalent rate. Calculations will return the amount to be paid or received.

LESSON 41

INTEREST RATE FUTURES

We shall cover following topics in this hand out:

- Interest rate future
- Prices in futures
- Hedging – short term interest rate (STIR)
- Scenario – Borrowing in ST and risk of rising interest
- Scenario – deposit and risk of lowering interest rates on deposits
- Options and Swaps
- Features of options
- Option terminology

Interest Rate Future:

Interest rate futures are also contracts, which have following features:

- These contracts are similar to currency futures.
- These are traded in standardized form on future exchanges.
- Settlement dates on future exchanges are calendar quarters.
- Each future contract is for standardized quantity of underlying security.
- Price of the future is expressed in terms of underlying item.
- Interest rate future, like currency futures may be settled before the maturity date.
- Short Term Interest Rate futures – STIRs are cash settled.

Long-term interest rate futures are settled through physical delivery of bonds.
STIRs: is a type of standardized interest rate future on a notional deposit (for 3 months) of standard amount of principal.
Bond futures: these are based on standard quantity of notional bonds. If buyer or seller does not close his position before the final settlement date, then the contract is settled through physical delivery.
Prices of interest rate future are determined as follows:

Bond futures: these are priced exactly the same way as normal bonds.

For example, an interest rate future may be priced at 109.50 per 100 nominal value of underlying notional bonds.

Short-term interest rate futures are price in unusual way: the price is calculated by deducting interest rate from 100. For example, if the interest rate is 6%, price will be 94. If 8%, price is 92. It means that if interest rate rises, the price will fall and vice versa.

Hedging with Short Term Interest Rates:

A company intends to borrow short term in future may be concerned about the rising short-term interest rates.
Or
A company planning to place an amount in a short-term deposit may anticipate drop in deposit interest rates.
The hedge is to establish a notional position to fix the interest rate in short term.

Scenario: a firm plans to borrow in short term and risk of rising short-term interest rates

A notional position is established with future. If the interest rate goes up, it will earn profit.

This profit will be used to offset the higher interest rate on loan when it is taken.
On the other side, if interest rates go down, it will result in loss with stirs, and this will be added to the interest on loan cost when loan will actually be taken out.
The hedge will be to sell short-term interest rate future.
If interest rates go up, it will result in profit. Price of future will fall. The future will be closed by selling at higher prices and then buying at lower price.

If interest rates move down, it will result in loss. Price of future will increase. The future will be closed by buying at higher price and selling at lower price.

Risk of fall in short term interest and firm plans to invest
If the short term interest rates fall the firm will make profit and this profit will be added to the interest earned by deposit to arrive at net return on deposit.
The loss of return on deposit due to fall in short term interest rates is off set by the profit on futures.
If interest rates go up, there will be loss on future contract but the same will be off set by higher interest rate on deposit.
The hedge can be created by buying short-term interest future.
Future position should be closed when actual deposit period begins by selling the same number of interest rate futures.
If interest rate rise, price will fall, loss will incur.
If interest rate fall, price will rise, profit will be generated.

We can now note two important issues while deciding to hedge using STIRs:
A hedge can be created by buying and selling the exact number of contract but in real life this is not the case and the hedge is not perfect. If the number of contracts needed to buy or sell is not a whole number then the company has to buy or sell to the nearest whole number. This hedge is not perfect. For example, a hedge would need 7.6 contracts to be bought or sold, and you cannot trade this number because contracts are available in whole number. The firm will be buying or selling seven or eight contracts.

If the intended loan or deposit period is less than three months or longer than three months, a different situation will arise. In these situations, where STIR contract is less than three months interest rate, the hedge will be created by adjusting the number of futures contracts required by a factor of X/3, where X, is the planned borrowing or investment period.
Options:
An option is a contract that confers a right to buy or sell a specific quantity or asset – but not the obligation, at agreed price on or before the specified future date.
Options are available for commodities (like wheat, coffee, sugar, etc) and financial assets like currency or bank deposits.
Features of Options:
It is a contractual agreement.
The holder of option exercises his/her right only if it is in his/her favours.
Option writer is seller and must honor his side of contract. (Sell or buy at agreed price).
Options like futures are standardized transaction in terms of size & duration.
Options are Exchange traded
These agreements are easy to buy & sell
Options either are call options or put options.
The option purchase price is called option premium.
Call option gives its holder a right (not obligation) to buy underlying item at the specified price.
Put option gives its holder a right (not obligation) to sell underlying item at specified price.

Expiry date:
Each option has expiry date and the holder must exercise his/her right before this date otherwise, it will lapse.
Strike or exercise price:
The price mentioned in option at which the holder exercises his right is known as exercise or strike price.

Options pricing
The strike price may be higher, lower or equal to the current market price of underlying item.

For example, a call option gives the right to its holder to buy x number of shares of y company at Rs 10 per share and the current price could be greater than Rs. 10/-, less than Rs. 10/- or exactly Rs 10/- per share.
If the strike price is more favorable than the current market price of underlying asset or item, the option is termed as "in-the-money."

If the strike price is not favorable than the current market price of underlying asset or item, the option is called "out-of-money."
If the strike price and current market price are equal, then it is known as "at-the-money."

An option holder will only exercise his option if it is "in-the-money".

LESSON 42

FOREIGN EXCHANGE MARKET'S OPTIONS

- How options work?
- Exercising the option
- Calculating gains on options
- Currency options
- Hedging with currency options

How Options Work?

Options are also used to reduce the risk of unfavorable price movements in stocks or share, or any commodity. In other words, the investor is trying to fix the price of the commodity or stock by trading now. Therefore, the first objective of using options is to eliminate the risk of adverse price movement. However, there may be some gain on this transaction with some chances of loss as well.

In order to understand how option actually works, we take up the following example and see what factors we need to consider when we are going to exercise the option:

An investor buys 20 options on shares of xyz ltd at a price of Rs 500 (per share). Each option consists of 100 shares and premium paid is Rs. 5/- per share. What will happen if, at the expiry of option, the share price is?

i) 516 or

ii) 490?

Looking at the example, the investor is trying to hedge the adverse price movement of that particular stock in near future. He may not have the funds right now and expects to receive the same in near future so he is interest in "arresting" the price now by buying an option. However, this is going to cost.

You can see that there is Rs. 5/per share as option cost. If the investor does not exercise the option, he must bear this in mind that "this cost" will represent the loss. In options, the loss is normally the amount that has been paid as option cost.

Now the question is "under what circumstances" the investor will exercise the option. The investor and the option seller have agreed over a price of Rs 500/ per share meaning that the investor will buy the agreed number of shares from the option seller for this per share amount, regardless of what per share cost actually prevail in the market on that date if date is falling within the terms of agreement.

Decision Rule:

If on or before the expiry date, the price of share is greater than the agreed rate of Rs. 500 per share, then the investor will exercise it right to buy stipulated number of shares from the option seller. Nevertheless, the cost factor should also be considered by deducting the cost per share from the prevalent price of the share on the exercising date.

Calculations of gain and loss:

Now if the share price, per first scenario, is Rs. 516, which is significantly above the agreed price of Rs. 500 per share, the option should be exercised. This is because at present this particular stock is being traded at Rs. 516 per share whereas the investor will get the same for Rs. 500 per share – the agreed price. This results in a gain of Rs. 16 per share and the total gain would be Rs 16 per share multiplied by total number of shares. Remember this will be gross gain and we need to subtract the option cost of Rs 5 per share to reach at net gain.

Now consider the other scenario. If the market price of share in question is Rs. 490 per share, the question will be "is there any benefit in exercising the option?"

No is the answer. Why? Look the market price of that stock now is Rs. 490 per share and that means that investor can buy it cheap from the market instead of buying form the option seller for Rs. 500 per share. In this situation, the investor is not going to exercise it and the cost paid as option fee represents the loss to the investor and gain to the option seller.

In both the situations we can easily sum up that loss of one party is the gain of other party. This is called zero sum game. Take the second scenario the investor is confront with the loss in terms of cost of option. The total loss is the cost of Rs. 5 per share multiplied by total number of shares (Rs. 10,000), which is the gain of the option seller.

Currency Options:
Currency option is a contract like equity options that we have covered in previous section. This is a contract, which confers right to the buyer to buy or sell (but not obligation) a fixed amount of underlying currency at a fixed price (strike price) on a fixed date (expiry).
Amount of underlying currency is governed by the contract size as determined in each currency. A buyer of a call option has a right but not the obligation to buy the underlying currency. A buyer of a put option has a right but not the obligation to sell the underlying currency. Premium is charged by option writer from option holder.

Hedging with Currency Option:
To construct a hedge with currency option, one needs to consider the following:
The extent of exposure and the currency involved – future receipt and payment to be determined.
Consider the hedging tool – a call or put option will serve the purpose.
Calculate the most suitable strike price out of several available.
Option will be only exercised if it is in the money and buy or sell the currency at the strike price.
Alternatively, let the option lapse if it is out of money. Progress
Interest Rate Options:
An investment tool whose payoff depends on the future level of interest rates. Interest rate options are both exchange traded and over-the-counter instruments.
An interest rate option carries a notional amount of principal, which means that it is not the actual amount to be taken out from a account. It is used to calculate the terminal gain or loss calculation. This aspect of interest rate options is similar to FRAs and short-term interest rate futures. Such options are either over the counter or exchange traded. We shall discuss exchange-traded options only.
If the option is exercised, it is cash settled. The strike rate for the option is compared with an agreed benchmark rate of interest. Benchmark rate may be KIBOR. (Karachi Inter Bank Offered Rate)

For example, a firm buys a borrowers' option in February to borrow a notional amount of Rs. 5 million on May 31 for three months at interest rate of 5% per annum. A premium is charged for the option.
At the expiry of three months, the benchmark rate may be higher than the strike rate of 5%. If so, the borrower's option is in the money and will be exercised. However, the option holder does not receive a three-month loan at 5%. Instead, it will borrow the money it needs at the prevailing market rate. The option seller must make a cash payment to the option holder for the difference between the benchmark and strike rate at the expiry date.
And if at expiry, the three-month benchmark rate is lower than the strike rate of 5% then the borrower's option is out of the money and the option will not be exercised. The company will borrow the money it needs in the market at the prevailing rate.

LESSON 43

FOREIGN EXCHANGE MARKET'S SWAPS

We shall cover following topics in this hand out:

- Calculating financial benefit – Interest rate Option
- Interest rate caps and floor
- Swaps
- Interest rate swaps
- Currency swaps

Calculating Financial Benefit – Interest Rate Option

Almost the calculation involved to reach at the gain or loss are the same as we did in equity or stock options. As earlier stated that loss under option is generally limited to the cost of option paid to the option seller. It is of immense importance to understand the scenario to perform calculations.

We take up borrowing scenario. The company or the firm intends to borrow in near future and anticipates that interest rates will be up when it actually will utilize the loan amount. If interest rises then it will be incurring more interest cost then present. Therefore, the firm will set up or buy the option against the rise in interest rates and the option will be profitable or exercisable only if interest rate does increase.

The calculations are as under (assuming that interest rates have gone up):

Compute the interest rate using notional amount @ prevailing interest rate. This will be the rate at the time of exercising the option, which is assumed higher than the agreed rate. **(Interest Expense)**

The second component is the cost of option. **(Cost of Options)**

Third line item in this calculation will be the receipt from the option seller. The notional amount is multiplied with the difference between the prevailing interest rate and agreed rate, adjusted for the period of loan. This is income of the option holder. **(Receipt from Option)**

If we sum

(Interest Expense) + (Cost of Options) - (Receipt from Option) = Net Interest Expense.

The next step will be to calculate the effective interest expense, which can be computed by dividing **Net Interest Expense** by the loan amount. This effective interest rate is less than the rate prevailing in the market.

Interest Rate Caps and Floor

Firms may borrow from a bank or deposit funds at variable rate of interest connected to some benchmark rate like KIBOR in Pakistan or LIBOR (London Inter Bank Offered Rate) in international money markets. When borrowing on variable interest rates, a firm may want to utilize option as hedging tool against the unfavorable interest rate movements **over the full term of loan or deposit.**

Interest Rate Cap is a series of borrower option that sets a maximum interest rate for a medium term loan. The cap holder has the right to exercise the option at each interest fixing date or rollover date for the loan. Whenever an option is exercised within a cap agreement, there is cash payment from the seller of the cap to the cap holder.

Interest rate floor is an option to limit interest rate to a given minimum.

This is a series of option for lenders setting minimum interest rate for medium term deposits. The floor holder can exercise option at the dates given in the option.

Interest rate caps & floor are like normal options with a difference that in case the option is exercised the cash settlement is made at the end of interest period and not in the beginning. Secondly, more than one period is covered and this may be two to five years divided into three or six month periods. However, these are very expensive options due to high premium cost.

Swaps

A swap is a contract between to parties to exchange their cash flows related to specific obligations for an agreed period. A swap may be for interest rate or for currency.

A vanilla interest rate swap is a contract between two parties to exchange interest rates on a notional amount at regular intervals. One party opts for interest payments based on the fixed interest rate and other at variable rate. A swap may have life up to 30 years. Swaps are used to hedge interest rate risk on short term as well as long-term instruments like bonds and loans.

A firm can use swaps to manage the mix of its fixed rate and floating rate debt obligations, without having to change the underlying loans themselves. Swap allows the company to borrow at an effective fix rate when it cannot do directly from the market due to its size.

If a firm anticipates a rise or fall in the short-term interest rates compared to long term interest rate, it may utilize swap to take more floating rate and less fixed rate debt obligations or the other way round.
In short, swap are used to exchange floating rate interest payments to fixed rate payments and fixed rate payment to floating rate payments.
Saving on the interest payment for borrowers arise because of arbitrage gains which are normally related to differential risk spreads on the floating and fixed loan in a single market where the premiums associated with fixed and floating debt are likely to differ because the markets have different characteristics.

Currency Swaps

These are similar to interest rate swaps but the underlying obligations are currencies. In currency swaps, the currencies underlying swap are exchanged at the end of the swap and may be at the beginning of the swap. When currencies are exchanged at the beginning and the end, same exchange rate is used. Putting in other words, amount exchanged at the start and end of swap is the same. Interest payments by each party could be fixed or floating.
With the standpoint of a financial manager or a treasurer, swap offer following benefits:
These provide access to greater markets where the companies have no direct approach. Particularly, large size and high rated companies have access to money market but swaps provide small companies to access this market.
It allows company to change an adverse fixed with favorable floating and vice versa.
Flexibility (not being standardized): swap can be arranged for any sum and period.
Comparatively low cost option
Off balance sheet transaction – shown as contingencies & commitments
However, there are some risks associated with swaps as well.
There may be some probability of default by either party before the swap expiry. This can be reduced by transacting with bank or using financial institution as an intermediary.
There is a market risk as well. This represents the increase in the interest rates unfavorably after the company has agreed to swap.

LESSON 44

EXCHANGE RATE SYSTEM & MULTINATIONAL COMPANIES (MNCs)

We shall take care of following topics in this hand out:

- Exchange rate determination
- Purchasing power parity theory
- PPP model
- International fisher effect
- Exchange rate system
  - Fixed
  - Floating
- Multinational companies (MNC)
- Reasons of growth in MNCs

Exchange Rate Determination:

There is no established standard or model that could measure the size of change in the exchange rate of two currencies. It is possible for a currency to depreciate relative to the other while appreciating against others. The exchange rate is normally measured against different benchmarks.

Most of our foreign exchange deals in Pak rupees are in exchange for US $ and some international trade is conducted only in US$. Pak rupees exchange rate with different currencies weighted according to the pattern of Pak trade will give a useful indication of the exchange rate of Pak rupees with rest of the currencies.

Changes and fluctuations in the exchange rate emerges from the change in the demand and supply of the currency. These fluctuations or changes are due to international trade. If our exports are more than our imports than this means the demand of our currency is rising and our currency will strengthen against the other currencies. Whereas, if our imports are greater than our exports, this means we need more foreign exchange or foreign currencies to pay import bill. Demand for foreign currencies will rise resulting in weakening of our local currency.

The exchange rate changes are also due to capital movements between economies. These transactions are effectively moving bank deposits from one currency to another. These flows are now more important than the volume of trade in goods and services. Thus, supply and demand for a currency may reflect events on the capital account.

Purchasing Power Parity Theory:

Purchasing power parity (PPP) is a theory, which states that exchange rates between currencies are in equilibrium when their purchasing power is the same in each of the two countries. This means that the exchange rate between two countries should equal the ratio of the two countries' price level of a fixed basket of goods and services. When a country's domestic price level is increasing (i.e., a country experiences inflation), that country's exchange rate must depreciated in order to return to PPP.

The basis for PPP is the "law of one price". In the absence of transportation and other transaction costs, competitive markets will equalize the price of an identical good in two countries when the prices are expressed in the same currency. For example, a particular TV set that sells for 750 Canadian Dollars [CAD] in Vancouver should cost 500 US Dollars [USD] in Seattle when the exchange rate between Canada and the US is 1.50 CAD/USD. If the price of the TV in Vancouver was only 700 CAD, consumers in Seattle would prefer buying the TV set in Vancouver. If this process (called "arbitrage") is carried out at a large scale, the US consumers buying Canadian goods will bid up the value of the Canadian Dollar, thus making Canadian goods more costly to them. This process continues until the goods have again the same price. There are three caveats with this law of one price. (1) As mentioned above, transportation costs, barriers to trade, and other transaction costs, can be significant. (2) There must be competitive markets for the goods and services in both countries. (3) The law of one price only applies to tradable goods; immobile goods such as houses, and many services that are local, are of course not traded between countries.

Purchasing power parity is an economic technique used when attempting to determine the relative values of two currencies. It is useful because often the amount of goods a currency can purchase within two nations varies drastically; based on availability of goods, demand for the goods, and a number of other, difficult to determine factors.

Purchasing power parity solves this problem by taking some international measure and determining the cost for that measure in each of the two currencies, then comparing that amount.

Purchasing power parity (PPP) is in economics the method of using the long-run equilibrium exchange rate of two currencies to equalize the currencies' purchasing power. It is based on the law of one price, the idea that, in an efficient market, identical goods must have only one price.
Purchasing power parity is often called absolute purchasing power parity to distinguish it from a related theory relative purchasing power parity, which predicts the relationship between the two countries' relative inflation rates and the change in the exchange rate of their currencies.
A purchasing power parity exchange rate equalizes the purchasing power of different currencies in their home countries for a given basket of goods. These special exchange rates are often used to compare the standards of living of two or more countries. The adjustments are meant to give a better picture than comparing gross domestic products (GDP) using market exchange rates. This type of adjustment to an exchange rate is controversial because of the difficulties of finding comparable baskets of goods to compare purchasing power across countries.

International Fisher Effect:
Nominal interest rates consists of two parts
- Return required by lenders
- Return to cover inflation

If real interest rates are same in all places due to free capital movement and because of law of one price, then any difference in interest rates will be due to inflation level at difference places. If the real interest rates in countries have not properly affected inflation rate, the capital will move from low to high interest country. Countries with high interest rate will register capital inflow and will result in appreciation in exchange rate.
Countries with low interest rate will experience capital outflow and will result in depreciation in exchange rate. This is known as interest rate parity model. Interest rate parity model shows that exchange rate can be predicted by taking into account the differences in nominal exchange rates.
If the forward rates for PKR against US $ is the same as spot rate between the two currencies but the nominal interest rates are higher in US then following would be the situation:
Pak investor will shift funds to US to earn higher return. There will be outflow of capital from PAK to US.
Pak interest rate will increase and spot $ rate will move up.

Exchange Rate System:
An exchange rate is the rate at which one currency can be exchanged for another. In other words, it is the value of another country's currency compared to that of your own. If you are traveling to another country, you need to "buy" the local currency. Just like the price of any asset, the exchange rate is the price at which you can buy that currency. Theoretically, identical assets should sell at the same price in different countries, because the exchange rate must maintain the inherent value of one currency against the other.

Fixed
There are two ways the price of a currency can be determined against another. A fixed, or pegged, rate is a rate the government (central bank) sets and maintains as the official exchange rate. A set price will be determined against a major world currency (usually the U.S. dollar, but also other major currencies such as the euro, the yen, or a basket of currencies). In order to maintain the local exchange rate, the central bank buys and sells its own currency on the foreign exchange market in return for the currency to which it is pegged.
If, for example, it is determined that the value of a single unit of local currency is equal to USD 3.00, the central bank will have to ensure that it can supply the market with those dollars. In order to maintain the rate, the central bank must keep a high level of foreign reserves. This is a reserved amount of foreign currency held by the central bank which it can use to release (or absorb) extra funds into (or out of) the market. This ensures an appropriate money supply, appropriate fluctuations in the market (inflation/deflation), and ultimately, the exchange rate. The central bank can also adjust the official exchange rate when necessary.

Floating
Unlike the fixed rate, a floating exchange rate is determined by the private market through supply and demand. A floating rate is often termed "self-correcting", as any differences in supply and demand will automatically be corrected in the market. Take a look at this simplified model: if demand for a currency is low, its value will decrease, thus making imported goods more expensive and thus stimulating demand for local goods and services. This in turn will generate more jobs, and hence an auto-correction would occur in the market. A floating exchange rate is constantly changing.

In reality, no currency is wholly fixed or floating. In a fixed regime, market pressures can also influence changes in the exchange rate. Sometimes, when a local currency does reflect its true value against its pegged currency, a "black market" which is more reflective of actual supply and demand may develop. A central bank will often then be forced to revalue or devalue the official rate so that the rate is in line with the unofficial one, thereby halting the activity of the black market.

In a floating regime, the central bank may also intervene when it is necessary to ensure stability and to avoid inflation; however, it is less often that the central bank of a floating regime will interfere.

Between 1870 and 1914, there was a global fixed exchange rate. Currencies were linked to gold, meaning that the value of a local currency was fixed at a set exchange rate to gold ounces. This was known as the gold standard. This allowed for unrestricted capital mobility as well as global stability in currencies and trade; however, with the start of World War I, the gold standard was abandoned.

At the end of World War II, the conference at Bretton Woods, in an effort to generate global economic stability and increased volumes of global trade, established the basic rules and regulations governing international exchange. As such, an international monetary system, embodied in the International Monetary Fund (IMF), was established to promote foreign trade and to maintain the monetary stability of countries and therefore that of the global economy.

It was agreed that currencies would once again be fixed, or pegged, but this time to the U.S. dollar, which in turn was pegged to gold at USD 35/ounce. What this meant was that the value of a currency was directly linked with the value of the U.S. dollar. So if you needed to buy Japanese yen, the value of the yen would be expressed in U.S. dollars, whose value in turn was determined in the value of gold. If a country needed to readjust the value of its currency, it could approach the IMF to adjust the pegged value of its currency. The peg was maintained until 1971, when the U.S. dollar could no longer hold the value of the pegged rate of USD 35/ounce of gold.

From then on, major governments adopted a floating system, and all attempts to move back to a global peg were eventually abandoned in 1985. Since then, no major economies have gone back to a peg, and the use of gold as a peg has been completely abandoned.

Why Peg?

The reasons to peg a currency are linked to stability. Especially in today's developing nations, a country may decide to peg its currency to create a stable atmosphere for foreign investment. With a peg, the investor will always know what his/her investment value is, and therefore will not have to worry about daily fluctuations. A pegged currency can also help to lower inflation rates and generate demand, which results from greater confidence in the stability of the currency.

Fixed regimes, however, can often lead to severe financial crises since a peg is difficult to maintain in the long run. This was seen in the Mexican (1995), Asian and Russian (1997) financial crises: an attempt to maintain a high value of the local currency to the peg resulted in the currencies eventually becoming overvalued. This meant that the governments could no longer meet the demands to convert the local currency into the foreign currency at the pegged rate. With speculation and panic, investors scrambled to get out their money and convert it into foreign currency before the local currency was devalued against the peg; foreign reserve supplies eventually became depleted.

Countries with pegs are often associated with having unsophisticated capital markets and weak regulating institutions. The peg is therefore there to help create stability in such an environment. It takes a stronger system as well as a mature market to maintain a float. When a country is forced to devalue its currency, it is also required to proceed with some form of economic reform, like implementing greater transparency, in an effort to strengthen its financial institutions.

Some governments may choose to have a "floating," or "crawling" peg, whereby the government reassesses the value of the peg periodically and then changes the peg rate accordingly. Usually the change is devaluation, but one that is controlled so that market panic is avoided. This method is often used in the transition from a peg to a floating regime, and it allows the government to "save face" by not being forced to devalue in an uncontrollable crisis.

Although the peg has worked in creating global trade and monetary stability, it was used only at a time when

all the major economies were a part of it. In addition, while a floating regime is not without its flaws, it has proven to be a more efficient means of determining the long-term value of a currency and creating equilibrium in the international market.

Multinational companies (MNC):
Economists are not in agreement, as to how multinational or transnational corporations should be defined. Multinational corporations have many dimensions and can be viewed from several perspectives.
Ownership criterion: some argue that ownership is a key criterion. A firm becomes multinational only when headquarter or parent company is effectively owned by nationals of two or more countries. For example, Shell and Unilever, controlled by British and Dutch interests, are good examples. However, by ownership test, very few multinationals are multinational. The ownership of most MNCs is uni-national. Depending on the case, each is considered an American multinational company in one case, and each is considered a foreign multinational in another case. Thus, ownership does not really matter.
Nationality Mix of Headquarter Managers: An international company is multinational if the managers of the parent company are nationals of several countries. Usually, managers of the headquarters are nationals of the home country. This may be a transitional phenomenon. Very few companies pass this test currently.
In other word, a MNC is a parent company that

1. engages in foreign production through its affiliates located in several countries,
2. exercises direct control over the policies of its affiliates,
3. Implements business strategies in production, marketing, finance and staffing that transcend national boundaries.

In other words, MNCs exhibit no loyalty to the country in which they are incorporated.

A MNC is a company that generates at least 25% of its total sales from foreign countries.

A MNC has offices / production facilities/ branches / subsidiaries spread across more than one country (home country). May have capital raised in billion in more than one location, using tax heavens, employing cheap labor.

the activities of several MNCs are of prime importance because of their size and the role they play in world economy. Some of the large MNCs are operating in more than 100 countries around the globe.

MNCs have received special attention in developing and less developed countries. This is a twin face issue. On one side, they bring necessary capital need to developing countries, contributing to their growth and reducing unemployment. On the other side, these MNCs exploit cheap labor and tax heavens in these developing countries.
Reason for MNC Growth:
Analysis has focused on those factors, which need to be present if the transformation of a national company into MNC is to be successful and these will be looked at in some depth. Of course, from one point of view one could say that the MNC results from a natural expansion from one country to another. The process has been greatly facilitated by the advancement in communication, both by physical and electronic and by the international mobility of capital.

With the restriction on capital mobility were reduces the companies in US and Europe found it beneficial to move their capital to the countries, who offered protection to their investments and also provided some incentives, in order to increase the return on their investments. By reducing the payroll cost and by paying far less taxes in developing countries, MNCs made filthy profits and significant portion of these were repatriated to their home country.

During the past two decades, the developing countries have eased many of the formalities for set up new business by designing business-friendly policies and removing barriers to make their country attractive to the foreign investors. In addition, these countries have reduced the tariffs to maximum extent in order to facilitate international trade between the countries.

LESSON 45

FOREIGN INVESTMENT

We shall take care of following topics in this hand out:

- Motives for foreign investment
- Economic and other motives
- International operations
- Different forms
  - Export
  - Branch
  - Subsidiary
  - Joint venture
  - Licensing agreements
- Political risk
  - Risk of confiscation
  - Commercial risk
  - Financial risk

Motives for Foreign Investment

We can divide the motives of MNCs into two broad categories. These are:

- Strategic motives
- Economic motives

Strategic Motives:

Market Development: A MNC may invest in foreign country in order to expand to new markets. Such companies have very strong product line and have expertise in the field of sales and marketing. Car assembly plants in Pakistan are a good example of market development.

Backward Integration: companies may be stretching to other countries in search and import to the home country cheap raw materials.

Cheap inputs: labor and raw materials in developing countries provide MNCs an opportunity to reduce the cost of sales, as labor is expensive in developed countries. This results in larger profit margin.

Political safety: Political stability and non-interference is what a MNC is looking for. Above all every company will ensure the safety of its investment.

Economic motives:

MNCs have competitive edge over the local companies due to their strengths.

Financial Strength: MNCs have much liquidity and funds available to invest internationally. Further, they have the ability to raise the money internationally at cheap rates compared to local companies. This is because of their ability to generate future cash flow. They have strong products, huge marketing network and efficient human resources to influence the money market. They can also raise capital by issuing shares and debt instruments because they have expertise with them.

Technological strength: MNCs are using latest and state of the art technology in the business. The ability to use technology to achieve the business efficiencies manifest cost control and profit enhancement.

Economies of scale: As the MNCs are operating all over the world having strong distribution network, the economies of scale is achieved by efficient utilization of fixed cost. This is the greatest advantage over the local companies.

Human resources: MNCs can hire and do have the best managerial and marketing capabilities. The human resources they employee are the world's best having diverse and inter-culture experience, which a local company cannot afford to have.

International Operations:

A company can kick start international operation in many ways. The option that a company would select is primarily dependent upon the surrounding circumstances. Most important factor would be the tax position of the entity because a company may be exposed to double taxation – in its home country and in the country of operation.

Different Ways to Commence International Operations:

Export

A company can feel its presence in the other country by exporting its products. This is probably a cheapest and in-expensive way to begin international operation because the company does not even set up any office in that country. It can tap the customers by approaching them online or through an agent. Although is cost effective way but this may not prolong because customers normally do not attach value to such a company who is "not" present physically in their country. They may feel the company will be able to meet its after sales commitments and warranty issues. Further, the company is not in a position to seek market related knowledge required to develop and improve markets and products. A company making export to other countries is always at risk of being exposed to protective tariffs that may result in loosing the competitiveness of the products in terms of price.

Branch

A company can commence it overseas operations swiftly by setting up a branch in other country. This will result in corporate presence in the country and will remove the issues we discussed in the above paragraph. A branch may have some staff members but a distribution network must exist. Even with the establishment of branch, the customers show less loyalty to the company's product because it is not very time taking issue to wind up the branch. Companies can close their branch with out any long proceedings. So starting operations through branch is a short-term option. As stated earlier, there are some tax consequences in running an overseas branch – it is likely that the profit of the branch would be treated as profit s of the parent company.

Subsidiary

A subsidiary is a legal entity in other country like the parent company. This represents long-term commitment to foreign country and increases the business reputation. There is a tax advantage, as the home country tax will only be levied until profits are repatriated to home. However, this is very expensive option in terms of upfront cost and working capital.

Joint venture

A jointly controlled entity by two or more venturer having a joint motive. Normally one venturer comes of local market or country of JV operations. Local venturer is considered expert and knowledgeable person as far as local market is concerned. This will help managing the business like obtaining loans, statutory regulation compliance, local laws, taxes etc.

Less risky as compared to subsidiary options.

A joint venture is a legal organization that takes the form of a short-term partnership in which the persons jointly undertake a transaction for mutual profit. Generally each person contributes assets and share risks. Like a partnership, joint ventures can involve any type of business transaction and the "persons" involved can be individuals, groups of individuals, companies, or corporations.

Joint ventures are also widely used by companies to gain entrance into foreign markets. Foreign companies form joint ventures with domestic companies already present in markets the foreign companies would like to enter. The foreign companies generally bring new technologies and business practices into the joint venture, while the domestic companies already have the relationships and requisite governmental documents within the country along with being entrenched in the domestic industry.

Licensing agreements

Such agreements are cheap, as these do not require any capital expenditure to expand to foreign lands. In other words, these are less risky. The license issuer receive fixed amount as a percentage of sales for granting license to the licensee. However, the licensor has little control over the licensee as far as the quality of goods is concerned. The licensor cannot exercise control over the licensee.

The licensee may transfer industrial secrets to another independent firm, thereby creating a rival.

Political risk:

Political risk can be divided into following categories:

1) Confiscation risk

The risk of loss of control, business may be taken over by the local govt. or intervention and interference by the local authorities. This risk can be reduced by insurance policies.

A JV would be preferable in less or developing country. A subsidiary would be preferable in stabled and developed countries. Even then, this risk is present and can be reduced by:

- High gearing
- High local loans/finances
- Share in equity from local resources

2) Commercial risk
- There may be discriminative laws for foreign companies – wages level or lower prices for products, repatriation of profits and more emphasis to use local resources.
3) Financial risk

- Restricted access to local resources – loans etc
- Terms of maximum foreign equity
- Restrictions on repatriation of capital and dividend
- Exchange and currency risk
- Measurement & management of political risk
- Comparative techniques like rating mapping
- Analytical techniques – special reports, expert opinion

**********THE END**********