

**MAKERERE UNIVERSITY
COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES (CoBAMS)
SCHOOL OF BUSINESS**

BACHELOR OF COMMERCIAL (EXTERNAL)

FOURTH YEAR

CORPORATE FINANCE (COX 4131) LECTURE NOTES

PREPARED BY

MR. TWINOBUHUGIRO MEDARD

&

MR. TUHIRIRWE INNOCENT

COURSE OUTLINE

Course Description

Corporate finance and investment decisions deals with advanced financial management skills needed in larger corporations. It considers the use of further investment appraisal techniques and share valuations in listed corporations.

Objectives or Aims

The course is designed to make students understand different categories of corporate stakeholders, financial objectives, capital structure theories and cost of capital, further aspects of investment appraisals, mergers and takeovers of business corporations, share/bond valuations and financial distress

Learning Outcomes

Upon completion of this course, students will be able to complete the following key tasks:

- Describe corporate stakeholders, financial objectives and reconciling multiple objectives.
- Discuss theories of capital structure.
- Determine cost of capital of any given business venture.
- Describe further aspects of investment appraisal like use of sensitivity analysis and expected values, inflation and interest rates and issues of capital rationing.
- Discuss various aspects of business mergers and takeovers
- Explain aspects of share/bond valuations.
- Discuss different aspects of financial distress and corporate restructuring

Intellectual, practical and transferable skills

- Problem solving skills
- Team work
- Analytical

Teaching and Learning Patterns

- Use of case studies
- class discussions
- straight lecture
- Group presentations

COURSE CONTENT

1. INTRODUCTION TO CORPORATE FINANCE

- Decision making and Corporate objectives
- Profit maximization and managerial objectives
- Reconciling multiple objectives
- Investment appraisal using NPV, IRR, PI, CB ratio
- Investment appraisal and sensitivity analysis
- The relationship between inflation rates and interest rates
- Dealing with inflation in NPV calculation
- Dealing with tax in NPV calculation
- Capital allowances/ WDA's and tax savings
- Asset replacement decisions
- Capital rationing

2. FINANCE IN A WORLD OF UNCERTAINTY

- Risk- return tradeoff
- Attitudes of risk
- Expected Net Present Value
- Introduction to Portfolio theory

3. SHORT/ MEDIUM AND LONG TERM FINANCIAL DECISIONS

- Sources of short and medium term finance
- long term sources of finance

4. DIVIDEND AND CAPITAL STRUCTURE DECISIONS

- Dividend decisions and shareholder value
- Capital structure and the required return
- Modigliani and Miller models of capital structure

5. CAPITAL MARKET THEORY

- Introduction to capital markets
- Operations of capital markets
- The Uganda securities exchange

- Financial markets hypothesis
- Empirical testing of efficient market hypothesis

6. COMPANY ANALYSIS ASSET VALUATION, MERGERS AND ACQUISITION

- Company analysis and valuation
- Analysis and valuation of stocks
- Analysis and valuation of fixed income securities
- Mergers and acquisitions

Assessment Method

The assessment method is structured to include coursework and final examination. Coursework consists of assignments, presentations and tests.

Course work assessment: 30%

Final Examination: 70%

Total Mark: 100%

The minimum mark required to pass is **50%**, this includes course work and final examination.

REFERENCES:

- ACCA Reading Text (Paper F9) on Financial Management 2007-2008
- Brealey, R and Myers, S (2003): Principles of corporate Finance. 7th edition McGraw Hill/Irwin
- Pike, R and Neale, B (1999): Corporate finance and investments: Decisions and strategies. 3rd edition prentice hall.
- Van Horne, J (2001): Financial Management and Policy .12th edition Prentice Hall
- Tony Davies, Tony Boczko and Jean Chen (2008) *Strategic Corporate Finance*. International Edition. UK, McGraw Hill Publishing.
- Richard A. Brealy and Stewart C. Myers (2008) *Principles of Corporate Finance*. International Edition. Athens, Greece, McGraw Hill Publishing.
- Stephen A. Ross and Randolph W. Westerfield (2008) *Essentials of Corporate Finance*. International Edition. Athens, Greece, McGraw Hill Publishing.

TOPIC ONE

INTRODUCTION TO CORPORATE FINANCE

LEARNING OUTCOMES:

At end of this topic a student will be able to:

- Explain the term finance and its functions
- Discuss the objective of decision making in corporate finance
- Explain the role of finance manager, financial controller and treasurer, the agency theory and Corporate Governance
- Discuss the goals of a firm.

PREAMBLE

Corporate finance is the field of finance dealing with financial decisions that business enterprise make and the tools and analysis used to make these decisions. The primary goal of corporate finance is to maximize corporate value while managing the firm's financial risks.

Although it is in principle different from managerial finance which studies the financial decisions of all firms, rather than corporations alone, the main concepts in the study of corporate finance are applicable to the financial problems of all kinds of firms. The discipline can be divided into long-term and short-term decisions and techniques. Capital investment decisions are long-term choices about which projects receive investment, whether to finance that investment with equity or debt, and when or whether to pay dividends to shareholders. On the other hand, short term decisions deal with the short-term balance of .current assets and current liabilities; the focus here is on managing cash, inventories, and short-term borrowing and lending.

Corporate finance covers every decision a firm makes that may affect its finances which can be grouped into five areas for the conceptual understanding.

1. The first is the objective function, where we define what exactly the objective in decision making should be.
2. The second is the investment decision, where we look at how a business should allocate of resources across competing uses.
3. The third is the financing decision, where we examine the sources of financing and whether there is an optimal mix of financing.
4. The fourth is the dividend decision, which relates to how much a business should reinvest back into operations and how much should be returned to the owners.
5. Finally, there is valuation, where all of the decisions made by a firm are traced through to a final value

Functions of Corporate Finance:

1. Acquisition of Resources: Acquisition of resource indicates fund generation at the lowest possible cost. Resource generation is possible through:

- (a) Equity: This includes proceeds received from retained earnings, stock selling, and investment returns.
- (b) Liability: This includes warranties of products, bank loans, and payable account.

2. Allocation of Resources: Allocation of resources is nothing but investment of funds for profit maximization. Investment can be categorized into 2 groups:

- (a) Fixed Assets – Buildings, Land, Machinery etc.
- (b) Current Assets – cash, receivable accounts, inventory, etc. Broad Functions of Corporate

Finance are:

- (1) Raising of Capital or Financing
- (2) Budgeting of Capital
- (3) Corporate Governance
- (4) Financial management
- (5) Risk Management

Decision making in corporate Finance:

1. Long term decisions: This includes capital investment decisions like viability assessment of projects, financing it through equity and/or debt, pay dividend or reinvest the profit. Long term corporate finance decisions that are normally related to fixed assets and capital structure are known as Capital Investment Decisions. Senior management always targets to maximize the value of the firm by investing in projects having positive Net Present Value. If such opportunities are not arising then reinvestment of profits should be stalled and excess cash should be returned to shareholders in form of dividends. Thus, Capital Investment Decisions constitute 3 decisions:

- (a) Decision on Investment
- (b) Decision on Financing
- (c) Decision on Dividend

2. Short term decisions:

These are also called working capital management decisions which try to strike a balance between current assets such as cash, inventories, etc and current liabilities i.e. a company's debts/obligations impending for less than a year.

1. Investment Decision: The firm has limited resources that must be allocated among challenging uses. On the one hand the funds may be used to generate added capacity which in turn generates additional revenue and profits and on the other hand some investments results in lesser costs. In financial management the returns, from a proposed investment are compared to a minimum acceptable hurdle rate in order to accept or reject a project. The hurdle rate is the minimum rate of return below which no investment proposal would be accepted.

2. Financing Decision: Another important area where financial management plays an important role is in deciding when, where, from and how to acquire funds to meet the firm's investment needs. These aspects of financial management have acquired greater importance in recent times due to the multiple avenues from which funds can be raised. Some of the widely used instruments for raising funds are ADRs, GDRs, ECBs Equity Bonds and Debentures etc. The core issue in financing decision is to maintain the optimum capital structure of the firm that

is in other words, to have a right mix of debt and equity in the firm's capital structure. In case of pure equity firm the shareholders returns should be equal to the firm's returns. The use of debt affects the risk and return of shareholders. In case, cost of debt is used the firm's rate of return the shareholder's return is going to increase and vice versa. The change in shareholders return caused by change in profit due to use of debt is called the financial leverage.

3. Dividend Decision: Dividend decisions is the third major financial decision The share price of a firm is a function of the cash flows associated with the share. The share price at a given point of time is the present value of future cash flows associated with the holding of share. These cash flows are dividends. The finance manager has to decide what proportion of profits has to be distributed to the shareholders. The proportion of profits distributed as dividends is called the dividend payout ratio and the retained proportion of profits is known as retention ratio.

4. Liquidity Decision: A firm must be able to fulfill its financial commitments at all points of time. In order to ensure this the firm should maintain sufficient amount of liquid assets. Liquidity decisions are concerned with satisfying both long and short-term financial commitments. The finance manager should try to synchronize the cash inflows with cash outflows. An investment in current assets affects the firm's profitability and liquidity. A conflict exists between profitability and liquidity while managing current assets. In case, the firm has insufficient current assets it may default on its financial obligations. On the other hand excess funds result in foregoing of alternative investment opportunities.

Role of finance manager, financial controller and treasurer, The agency theory and Corporate Governance

Role of Shareholders and the Role of Managers

Although ordinary shareholders are the owners of the company to whom the board of directors are accountable, the actual powers of shareholders tend to be restricted, except in companies where the shareholders are also the directors. They have no right to inspect the books of account, and their forecasts of future prospects are gleaned from the annual report and accounts, stock brokers, journals and daily newspapers.

The day to day running of a company is the responsibility of the directors and other management staff to whom they delegate, not the shareholders. For these reasons, therefore, there is potential for conflicts of interest between management and shareholders.

Shareholders used to take a passive role in the affairs of the company. It was once common to play down their influence, though legally the owner of the business, it was assumed that they did not much concern themselves with the way that the company was run. The result has changed partly because of a change in the type of shareholder, partly due to result of takeover activity and partly because of social pressures. Shareholding has changed from private investors to institutional investors, who are able to employ experts to advice on the investment funds. The company must accordingly be run in a way that guarantees the satisfaction of the shareholder- an increasing sophisticated shareholder, who will both be competent and keen to assess for himself the truth behind any optimistic statements.

The power that the institutional shareholders have over a company rests on the effect that their investment decisions can have on the share price of a company, on the fact that at times of takeover bid the decision of a few shareholders can have a major influence on whether the bid succeeds or fail, and on the fact that the institutions have large amount of funds that can be made available to a company. The type of shareholders and the way they behave is changing. Traditional relationships are changing. The institution needs the companies, as they need good investment opportunities in a healthy economic climate, in order to be able to meet their future pension and assurance obligations. The relationship between the shareholders of a company and the management is one which is complex.

Agency Theory and Agency Problems

The relationship between management and shareholders is sometimes referred to as an agency relationship, in which managers act as agents for the shareholders, using delegation powers to run the affairs of the company in the best interest of the shareholders.

Agency problem: a potential conflict of interest between the agent (manager) and the outsider shareholders. (i.e. those not involved in running the business) and the creditors. For example, if managers hold none or very little equity shares of the company they work for, what is to stop them from working inefficiently, not bothering to look for profitable new investments opportunities, or giving themselves high salary or perks?

Agency theory: proposes that, although the individual members of the business team act in their own self interest, the well being of each individual depends on the well being of other team members and on the performance of the team in competition with other teams. One power that shareholders possess is the right to remove the directors from office but shareholders have to take initiative to do this, and in many companies, the shareholders lack energy and organization to take such a step. Even so, directors will want the company's report and accounts, and the proposed final dividend, to meet with the shareholders' approval at annual general meeting.

Another reason why managers might do their best to improve the financial performance of their company is that managers' pay is often related to the size or profitability of the company. Managers in very big companies, or in very profitable companies, will normally expect to earn higher salaries than managers in smaller or less successful companies.

Another source of conflict between managers and shareholders is that they have different attitude towards risk. A shareholder can spread his risk by investing his money in a number of companies; one company may go into liquidation but the shareholders' financial security is not threatened. A manager's financial security however, usually depends on what happens to the one company that employs him. The manager could therefore be less inclined than the shareholder to invest company's funds in a risky investment.

A further situation in which conflict can arise is when a company is subject to takeover bid. The shareholders of the acquired firm very often receive above normal gains for the share price while managers loose their job, if lucky they may be picked by the new shareholders. It can therefore

be argued that it is therefore not always the shareholders interest for the sought-after companies put up such a defense to drive the bidder away.

Agency theory suggests that audited accounts of a limited company are an important source of post- decision information minimizing investors' agency costs, in contrast to the alternative approaches which see financial reports as primarily a source of 'pre-decision' information for the equity investors.

Goal Congruence

Goal congruence is accordance between the objective of agents acting within an organization and the objectives of the organization as a whole. Managers can be encouraged to act in shareholders' best interests through incentives which reward them for good performance but punish them for their poor performance. Examples of such rewards or incentives are:

- **Profit related pay:** If management are rewarded according to the level of profit made they will strive to achieve high profit levels, so that they should earn more. Shareholders wealth is going to increase, so too is the value of the firm. Sometimes such act might just encourage creative accounting whereby management will distort the reported performance of the company in the service of the managers' own ends.
- **Rewarding managers shares:** This might be done when a public company goes public and managers are invited to subscribe for shares in the company at an attractive offer price. Managers will have a stake in the business and will venture only into those projects which enhance the share value of the business.
- **Direct intervention by shareholders.** As outlined above the pattern of shareholding has changed from passive private investors to aggressive intuitional investors. These shareholders have direct influence over the performance of an enterprise and take active role in checking the performance of the company and are very quick to lobby other small shareholders when they suspect poor service or any malpractice by the directors.
- **Threat of firing.** Shareholders can take a direct approach by threatening the managers with dismissal if they put their personal interest above that of maximizing the value of the firm. The increase in institutional investors has improved the shareholders powers to

dismiss directors as they are able to dominate but also lobby other shareholders in decision making.

- **Threats of takeover:** As stated managers would do everything possible to frustrate takeovers as they are aware that they are going to lose their job. To promote goal congruence the share holders may threaten to accept takeover bid if their set targets are not met by managers.

Goals of a firm.

A corporate chief executive encompasses the final responsibility for a successful company development. He sets the objectives for the business and specifies strategies for their achievement. In this unique role he is also responsible for the funding of the business. Being under the pressure of different interest groups the question arises which interest should be given priority? Creating real wealth for *all* stakeholders.

- ***Shareholder wealth maximization***
- ***Profit maximization***
- ***Sales maximization***
- ***Survival***
- ***Environmental protection***
- ***The Growth of Corporate Responsibility: Corporate responsibility'*** is the phrase used to describe businesses which have decide to behave in a deliberately socially responsible manner. Obeying the strict letter of the law doesn't always solve these problems, although it does keep the business out of trouble with the authorities. Laws are general, and don't always act as a good guide to decisions in any one individual case. Laws have to interpreted by courts, and it is not always obvious what is illegal until the case goes to court. Laws don't cover all the areas that people consider important in ethical behavior. For example, it may be perfectly legal to dump waste at sea, but many people would consider this to be unacceptable behavior.
-
- In many cases different ethical principles pull in opposite directions. For example, closing a polluting factory may be good for the environment, but it is not going to help the local community who need the jobs and the incomes. What should the business do? Whatever it does, it is going to

upset one group of people or another, because society at large cannot clearly answer these questions, and there is no clear guide to the business how to behave.

Profit Maximization and Managerial Objectives

In the conventional theory of the firm, the principle objective of a business firm is to maximize profit. Under the assumptions of given taste and technology, price and output of a given product under competition are determined with the sole objective of maximization of profit.

Profit maximization refers to the maximization of income of the firm. Under profit maximization objective, business firms attempt to adopt those investment projects, which yields larger profits, and drop all other unprofitable activities. In maximizing profits, input-output relationship is crucial, either input is minimized to achieve a given amount of profit or the output is maximized with a given amount of input. Thus, this objective of the firm enhances productivity and improves the efficiency of the firm.

The conventional theory of the firm defends profit maximization objective on the following grounds:

- * In a competitive market only those firms survive which are able to make profit. Hence, they always try to make it as large as possible. All other objectives are subjected to this primary objective.
- * Profit maximization objective is a time-honored objective of a firm and evidence against this objective is not conclusive or unambiguous.
- * Though not perfect, profit is the most efficient and reliable measure of the efficiency of a firm.
- * Under the condition of competitive market, profit can be used as a performance evaluation criterion, and profit maximization leads to efficient allocation of resources.
- * Profit maximization objective has been found extremely accurate in predicting certain aspect of firm's behaviour and trends; as such the behaviour of most firms are directed towards the objective of profit maximization.

Managerial Objectives

Small-business management must achieve strategic objectives with limited resources. The objectives provide a company its identity, direct the organization's efforts and motivate employees. The objectives are the basis of managerial functions and the criteria incorporated in organizational controls. The manner in which managers accomplish such objectives varies from one company to another. However, a large majority of businesses, regardless of industry, company size or location, adopt profitability, productivity, survival and growth objectives.

Profitability

Profit is a small-business manager's major incentive. Managers do what is necessary for a company's revenues to be sufficient not only to earn profits in the present, but the long term as well. Such leaders view profits as a means to finance company growth, provide employee benefits and finance the company's social responsibilities. In addition, managers view profits as a quantitative measure of a company's operational efficiency. Therefore, these leaders work to make the most of current revenue-generating business opportunities while identifying future profit-earning prospects. For example, a company might implement a new production line to manufacture custom products with less scrap or introduce new products and expand current markets. Business leaders also carefully manage expenses to increase profits. For example, a company might contract with lower-cost vendors or form a joint venture to control costs.

Productivity

As a company's use of resources becomes more efficient, the greater its productivity and profitability should become. As a result, management is concerned not only with output per man hour, but also the productive use of other resources as well. For example, management focuses on ways to make production, distribution and administration processes more efficient. In doing so, production cost per unit declines, which can lead to lower prices and a competitive advantage. A company also might become more productive by implementing materials requirements, planning to ensure required production materials are available as needed or instituting quality controls to minimize defect costs.

Growth

The primary intent of business is to grow market share, revenues and profits. As a result, a key managerial objective is to increase the sales of existing products and services in current markets. To do so, a company might implement a market penetration strategy by promoting a new use of a product or attempt to attract non-users and competitors' customers to the company's brands. For example, customers use pegboard for tool storage in garages and craft supplies in a workroom. Managers may also support the development of new products that reflect current consumer demand, such as gluten-free foods, or develop new markets to achieve growth. For example, a company might promote the use of garden fixtures as home or holiday decor or offer computers and peripheral devices, which are traditionally, manufactured using black exterior materials for corporate use, in neon colors for personal use

Survival

Managers recognize that a company survives only if it produces and distributes products at price greater than its variable and fixed costs. Therefore, company survival is a critical managerial objective. Managers must identify ways to fend off the negative effects of environmental issues, such as recession, changes in customer preferences and antiquated technology. Managers also must avoid the negative effects of a lack of materials availability and issues with production facilities. If leaders are effective in meeting such changes in their operating environment, a company will recover its costs, meet its obligations to creditors, suppliers and employees, and remain a going concern. If not, the company will not survive.

CAPITAL INVESTMENT APPRAISAL

Introduction

An investment is any expenditure in the anticipation of future benefits. Such expenditure can be divided into two categories, capital expenditure and revenue expenditure.

Capital expenditure is one, which results in the Acquisition of fixed assets or an improvement in the earning capacity.

Revenue expenditure is that incurred for the purpose of trade and to maintain the existing earning capacity of fixed assets.

Capital Expenditure Appraisal Methods.

Capital expenditure unlike revenue expenditure is non routine, irregular and usually involves large amounts. Due to this, before its incurred, the organisation should go through a capital budgeting process which entails.

- ⇒ Identification of a need (problem Definition)
- ⇒ Generating possible courses of action
- ⇒ Appraisal/ Evaluation of possible courses of Action
- ⇒ Selection of the best alternative
- ⇒ Implementation of selected alternative
- ⇒ Monitoring and control

In order to appraise projects, one needs to forecast the cash flows expected from and to be incurred on the project over its life span. When forecasts of costs and benefits have been made for a capital project, the estimates must be analysed to establish whether the projects should go ahead.

There are various methods of carrying out a capital expenditure appraisal. The methods include:-

- Return on Capital Employed /Accounting Rate of Return (ARR)
- Pay back Period method
- The Net present value method (NPV)
- Internal rate of return method (IRR)
- *Profitability index (PI)*

*NB ARR and Pay back Period method are referred to as types of non Discounted cash flow techniques while NPV, IRR and PI are types of Discounted Cash flow Techniques***Non Discounted Cash flow Techniques**

Accounting Rate of Return /Return on Capital employed.

This method estimates the Accounting rate of return for a project which is then compared with the target rate of return to decide whether the project is viable or not.

It is given by

$$\text{ARR} = \frac{\text{Estimated average profits}}{\text{Estimated average investment}}$$

Or

$$\text{ARR} = \frac{\text{Average Annual profit before interest and tax but after Depreciation}}{\text{Initial Capital}}$$

Illustration.

R plc's target accounting rate of return is 20%. The Company is considering a project with the following cash flows.

Cost of Assets (investment)	£80,000
Estimated life	4years

Estimated profit before depreciation

Year 1	£20,000
Year 2	£25,000
Year 3	£35,000
Year 4	£25,000

The capital asset would be depreciated by 25% of its cost each year – straight line method.

You are required to assess whether the project should be undertaken

Solution.

Year	Profit after depreciation
1	0
2	5,000
3	15,000
4	<u>5,000</u>
Total	<u>25,000</u>

Using the formula

$$\text{APR} = \frac{\text{Estimated average profit}}{\text{Estimated initial investment}} \times 100$$

$$\text{Estimated average Profit} = \frac{25,000}{4}$$

Initial Investment = 80,000

$$\begin{aligned} \text{ARR} &= \frac{6250}{80,000} \\ &= 7.8\% \end{aligned}$$

Pay Back Period Method

Pay back method determines the time it takes the cash inflows from an investment to equal the cash outflows spent on the investment.

Given two projects which are both viable, the one with a shorter payback period is preferred to the other.

For a project with uniform Cash flow, The Payback period is given by

Initial outflow

Annual cash inflows

But for a project with non-uniform cash flows, the best method is to subtract the cash inflows from the cash out flows until the out flow are Exhausted.

Discounted Cash flow Techniques(DCF)

Discounted cash flow Techniques are those investment appraisal techniques that take into account both the timing of cash flows and also the total profitability over a project's life.

There are 2 main discounted cash flows Techniques that is Net present value (NPV) and internal rate of return (IRR)

Using DCF techniques, all expected payments and Receipts from a capital investment are discounted to a present value using the formula:

$$\text{PV} = \frac{\text{FV}}{(1 + r)^n}$$

Where

PV is present value FV is future value r is the cost of capital n is the period

Therefore the present value for a future cash flow is calculated by multiplying future cash flow by a factor

$$\frac{1}{(1 + r)^n}$$

Net Present Value – NPV

Net present value is the value obtained by discounting all cash out flows and inflows of a capital investment project by a chosen target rate of return (cost of capital).

The NPV method compares the present value of all the cash in flows from an investment with the present value of all cash outflows from the same project. The NPV is thus calculated as the Present value of cash inflows minus the present value of cash outflows.

If NPV is positive then the cash flows from capital investment will yield a return in excess of the cost of capital. In this case, the project should be undertaken.

If NPV is negative, then the cash flows from capital investment will yield a return below the cost of capital. The project should be rejected.

If NPV is zero, then the cash flows from the capital investment will yield a return exactly equal to the cost of capital and the decision in this case will depend on the circumstances at hand.

Assumptions in DCF about the timing of cash flows.

As a general rule the following assumption are taken

- a) A cash outlay to be incurred at the beginning of an investment project 'now' occurs in year 0 and the present value of £1 now is £1 regardless of the value of r .
- b) A Cash out lay or inflow which occurs during the course of the period is assumed to occur all at once at the end of the time period e.g. receipts of £5,000 during year 2 are therefore assumed to occur at the end of year 2.

- c) If a cash outlay or receipt occurs at the beginning of a time period it is taken to occur at the end of the previous period. Therefore a cash outlay of £10,000 at the beginning of year 2 is taken to occur at the end of year 1.

Illustration.

S Ltd is considering a capital investment, where the estimated cash flows are as follows

Year	Cash flows in £
0	(100,000)
1	60,000
2	80,000
3	40,000
4	30,000

The company's cost of capital is 15%. You are required to calculate the NPV of the project and assess whether it should be undertaken

Solution

Year	Cash flows in £	discounted factor at 15%	Present value in £
0	(100,000)	1	(100,000)
1	60,000	0.870	52,200
2	80,000	0.756	60,480
3	40,000	0.658	26,320
4	30,000	0.572	17,160
NPV			56,160

Use Of Annuity Factors

Where there is a constant/uniform cash flow from year to year, the present value/discount factor can be found by summing the discount factors for all those years and multiplying this with the constant cash flow. This can also be read from the annuity factor table.

Illustration

EL Limited is considering the manufacture of a new product. Which would involve the use of both a new machine costing £150,000 and an existing machine which cost £80,000 two years ago and has a current net book value of £60,000. There is sufficient capacity on this machine which has so far been under-utilised. Annual sales of the product would be 5,000 units selling at £32 per unit.

Unit costs would be as follows

	£
Direct Labour – 4 hours at £2 per hour	8
Direct materials	7
Fixed costs including Depreciation	<u>9</u>
	<u>24</u>

The project would have a five year life after which the new machine would have a net residual value of £10,000. Because direct labour is continuously in short supply, labour resources would have to be diverted from other work which currently earns a contribution of £1.50 per direct labour hour. The fixed overhead absorption rate would be 2.25 per hour (£9 per unit) but actual expenditure on fixed overhead would not alter:

Working capital requirements would be £10,000 in the first year, raising to £15,000 in the second year and remaining at this level until the end of the project, when it will all be recovered. The company's cost of capital is 20%. Ignore taxation.

Assess whether the project is worthwhile.

Solution

Relevant cash flows are as follows

a) Year 0.	purchase of machine	£150,000
b) Year 1-5	contribution from new product [5000 x (32-15)]	85,000

Less contribution foregone

[5,000 X (4x 1.5)]

30,000

55,000

c) The project requires £10,000 of working capital at the end of year 1, a further 5000 at the start of year 2.

Year	Equipment	Working capital	Contribution	Net cash flow	Discount factor	PV of net cash flow
	£	£	£	£	20%	£
0	(150,000)			(150,000)	1.00	(150,000)
1		(10,000)		(10,000)	0.833	(8,333)
2		(5,000)		(5,000)	0.694	(3,470)
1-5			55,000	55,000	2.991	164,505
5	10,000	15,000		25,000	0.402	10,050
					NPV	

Annual cash flows in perpetuity.

The PV of cash flow in perpetuity is given by $\text{Future Value} / r$ i.e. $(\text{Future Value}) \times 1/r$

Illustration

PQ Ltd's cost of capital is 14% and its managers are considering investing in a project costing £500,000 that would yield cash flows of £100,000 per annum in perpetuity.

Required

Assess whether the project is viable or not Solution

Year	Cash flow	Discount factor	Present value
	£	14%	£
0	(500,000)	1.00	(500,000)
1- ∞	100,000	7.143	7143,000
			214300

Internal Rate of Return Method

This method determines the DCF rate of return at which the NPV is zero. If the expected rate of return exceeds target rate of return, then the project would be worth undertaking. On the other hand if the IRR is less than the target rate of return, then the project is not worthwhile financially.

The computation of IRR is by use of interpolation. The interpolation method produces an estimate of the IRR.

Procedure followed when estimating IRR

- 1) By trial and Error calculate a net present value using a rate which is likely to give an NPV close to zero.
- 2) After calculating the first NPV,
 - a) If the NPV is positive, use a second rate which is higher than the first one to compute NPV again.
 - b) If the NPV is negative, use a second rate which is lower than the first one to compute NPV again.
 - c) Make sure that you have 2 rates and 2 NPVs (ideally one positive and one negative).

Then use the 2 sets to estimate the IRR using the formula.

$$\text{IRR} = a + [A / (A-B) \times (b-a)]$$

Where

a is the lower rate b is the higher rate A is NPV obtained using lower rate

B is NPV obtained using higher rate.

OR

$$\text{IRR} = \frac{N_1 R_2 - N_2 R_1}{N_1 - N_2}$$

Where N_1 is the NPV at rate R_1 N_2 is the NPV at rate R_2 R_1 is the lower rate R_2 is the higher rate.

Illustration

A company is trying to decide whether to buy a machine for £80,000 which will save costs of £20,000 per annum for 5 years and which will have a resale value of £10,000 at the end of year

5. It is the company's policy to undertake projects only if they are expected to yield a DCF return of 10% or more, ascertain whether this project should be undertaken.

Solution

At rate of 9%.

Year	Cash flow	PV factor at 9%	PV of cash flow
0	(80,000)	1.000	(80,000)
1-5	20,000	3.890	77800
5	10,000	0.650	6500
		NPV	4300

At rate of 12%

Year	Cash flow	PV factor at 12%	PV of cash flows
0	80,000	1.000	(80,000)
1-5	20,000	3.605	72100
5	10,000	0.567	5670
		NPV	(2230)

Using the formula

$$IRR = a + [A/(A-B) \times (b-a)]$$

$$= 9\% + [4300/4300 + 2230 \times 3\%]$$

$$= 0.1098 \sim 11\%$$

OR, using

$$\frac{N_1 R_2 - N_2 R_1}{N_1 - N_2}$$

$$N_1 - N_2$$

$$\frac{(4300 \times 0.12 + 2230 \times 0.09)}{4300 + 2230}$$

$$= 0.1098 \sim 11 \%$$

NB

- 1) IRR of a project with cash flows to perpetuity is given by

$$\frac{\text{Annual inflow}}{\text{Initial investment}} \times 100$$

- 2) NPV is a superior technique compared to IRR. So in case of conflict, the NPV indicator should be taken.

Read about

1. *Comparing NPV and IRR where*
 - *There are Non-conventional cash flow*
 - *The projects are not all exclusive*
 - *The Re investment assumptions*
2. *The advantages and disadvantages of NPV and IRR.*

ALLOWING FOR INFLATION IN INVESTMENT APPRAISAL

As the inflation rate increases, so will the minimum return required by an investor.

In general there are two effects of inflation on project appraisal.

- a) The discount rate will be affected by the inflation
- b) The cash flows will also be affected by the inflation over time.

Effect of Inflation on the Discount Rate

Since the discount rate reflects the funds providers' required rate of return, in terms of inflation, the fund providers will require a return that

- 1. Compensates them for the inflation to maintain their purchasing power – inflation rate.
- 2. A return for the use of their funds i.e. real return.

A rate that combines the two elements is called the money rate of return/ Nominal rate of return. The money rate of return is the summation of the real rate of return and the inflation rate. The money rate of return is given by the formula.

$$(1 + \text{money rate}) = (1 + \text{real rate}) \times (1 + \text{inflation rate})$$

$$(1 + m) = (1 + r) \times (1 + i)$$

$$1 + r = \frac{1 + m}{1 + i}$$

$$1 + i$$

For example given that an investor's expected rate of return (Real rate) is 10% and the inflation rate is 5%. The money rate that compensates this investor for the inflationary tendency would be

$$1 + m = (1 + r) \times (1 + i)$$

$$1 + m = (1 + 0.1) \times (1 + 0.05)$$

$$1 + m = 1.155$$

$$m = 1.155 - 1$$

$$m = 0.155 \approx 15.5\%$$

When discounting cash flows with inflation you can use either the real rate or the money rate as long as the real rate is used on the real cash flows and the money rate is used on the money cash flows. Money cash flows refer to cash flows expressed in term of actual number of pounds that will be received or paid on the various future dates, while

Real cash flows are those expressed in terms of the value of the pound at time 0 (at constant price level terms).

Illustration

K Ltd is considering a project which would cost £7,500 now. The expected annual returns for its life span of 4 years are £3750. The project will cause savings of £750 a year in year 1 rising by 5% each year because of inflation. The running costs will be £1500 in the first year but would increase at 10% each year because of inflating labour costs. The general rate of inflation is expected to be 7.5% and the company's required money rate of return is 16%. is the project worthwhile? **Solution**

Year	Cash flow	Discount factor	PV Cash flows
	£	At 16%	£
0	(7,500)	1.000	(7,500)
1	3,000	0.862	2,586
2	2,888	0.743	2,146
3	2,762	0.641	1,770
4	2,621	0.552	1,447
		NPV	449

Working

Year	Fixed Income	Savings	Running Cost	Net Cash Flows
1	3750	750	1500	3000
2	3750	788	1650	2888
3	3750	827	1815	2762
4	3750	868	1997	2621

Illustration

A Company is considering investing in a project which will require purchasing a machine at 750,000. The project will result in following cost savings before allowing for inflation.

Year	Materials £	Wages £	Total savings £
1	220,000	110,000	330,000
2	140,000	102,000	242,000
3	380,000	152,000	532,000

The general inflation rate is expected to remain constant at 5%. Given that the shareholders required rate of return is 10% before considering inflation, evaluate the project in terms of

- a) Real cash flows and discount rates
- b) Money cash flows and discount rates

a) The real cash flows and discount rate are given.

Year	Cash flow £	PV factor at 10%	PV cash flows £
0	(750,000)	1.000	(750,000)
1	330,000	0.909	299970
2	242,000	0.826	199892
3	532,000	0.751	399532
		NPV	149,394

b) Money cash flows and discount rate

From $1 + m = (1 + r) \times (1 + i)$

$$1 + m = (1 + 0.1) \times (1 + 0.05)$$

$$1 + m = 1.155$$

$m = 0.155 = 15.5\%$. In order to generate money cash flows, we increase the real cash flows by the percentage rate of inflation.

Year	Real cash flow	Inflation factor	Money cash flow	Discount factor at 15.5%	PV cash flows
0	(750,000)	1	(750,000)	1.000	(750,000)
1	330,000	$(1.05)^1$	346,500	0.866	297,990
2	242,000	$(1.05)^2$	266,805	0.750	200,104
3	532,000	$(1.05)^3$	615,856	0.649	399,691
				NPV	147,785

ALLOWING FOR TAXATION IN INVESTMENT APPRAISAL

Taxation affects the investment appraisal in two ways.

- a) Tax charged on the company's profit will affect the cash flows depending on when it is actually paid. Generally cash receipts /payments will give rise to tax payable /tax relief
- b) Tax relief in interest which a firm pays and hence the opportunity cost of capital.

N.B. Tax relief gives rise to tax savings and hence cash inflows.

Assumptions normally adopted where taxation is relevant

- Taxable profits are the net project cash flows
- Current tax rate applies
- Where a tax loss arises from the project, there are sufficient taxable profits elsewhere in the organisation to allow the loss to reduce any relevant tax payment
- The first capital allowance claim is immediate, with the first benefit one year later.
- The company has sufficient profits to obtain full benefit from capital allowances, and there are balancing adjustments on the disposal of all assets.

Illustration

PL Ltd is considering the purchase of a machine costing £40,000. It would have a life of 4 years after which it would be sold for £5,000. The machine would create annual cost savings of £14,000. It would also attract writing down allowance of 25% on reducing balance basis which would be claimed against taxable profits of the current year which is soon to end. A balancing allowance or charge would arise on disposal. The rate of corporation tax is 30% and tax is payable one year in arrears. The after tax cost of capital is 8%. Assume that tax payments occur in the year following the transactions.

Solution

Computation of capital allowance

Year	Allowance	Balance
0- 25% x 40,000	10,000	30,000
1- 25% x 30,000	7,500	22,500
2- 25% x 22,500	5,625	16,875
3 - 25% x 16,875	4,219	12,656
4- 25% x 12,656	3,164	9,492

Sales process	5,000
Less Net book value	<u>9,492</u>
Balancing allowance	<u>4,492</u>

COMPUTING THE NPV

Yr	Equip	Savings	Tax on saving	Tax saved on capital allow	Net cash flows	Discount factor at 8%	PV of cash flows
	£	£	£	£	£	£	£
0	(40,000)				(40,000)	1.000	(40,000)
1		14,000		3,000	17,000	0.926	15,742
2		14,000	(4,200)	2,250	12,050	0.857	10,327
3		14,000	(4,200)	1,688	11,488	0.794	9,121
4	5,000	14,000	(4,200)	1,266	16,066	0.735	11,809
5		-	(4,200)	2,297	1,903	0.681	1,296
						NPV	5703

Alternatively

The tax computation can be as follows

Year	0	1	2	3	4
Cost savings	-	14,000	14,000	14,000	14,000
Capital allowance	(10,000)	(7,500)	(5,625)	(4,219)	(7,656)
Change in Taxable profits	(10,000)	6,500	8,375	9,781	6,344
Tax at 30%	3,000	1,950	2,512	2,934	1,903

Net cash flows would be as follows

Year	Equipment	Savings	Tax effect	Net cash flow
	£	£	£	£
0	(40,000)			
1		14,000	3000	17,000

2		14,000	(1950)	12,050
3		14,000	(2512)	11488
4	5000	14,000	(2934)	16,066
5			(1903)	(1903)

NB. When tax is ignored in DCF calculations, the discount rate will reflect the pre tax rate of return required on capital investments. When taxation is included in the cash flows, a post-tax required rate of return should be used

PROJECT APPRAISAL UNDER UNCERTAINTY

The cash flows used in the evaluation of projects are normally generated through forecasts and so are the other variables like inflation. Due to this, there is a lot of uncertainty surrounding the viability of a project.

There are a number of techniques that can be used to reduce on the uncertainty. These include.

- Setting a maximum payback period
- Using a high discounting rate
- Making prudent estimates of cash flows to assess the worst possible situation.
- Use of sensitivity analysis
- Use of certainty equivalent approach
- Use of simulation model

Sensitivity Analysis

This is a method of analysing the risk surrounding a capital expenditure project and enables an assessment to be made of how responsive the project's NPV is, to changes in the variables that are used to calculate NPV.

The basic approach of sensitivity analysis is to calculate the project's NPV under alternative assumptions to determine how sensitive it is to changing conditions. An indication is thus provided of those variables to which the NPV is most sensitive, these are the critical variables. Sensitivity analysis then determines the extent to which these variables may change before the investment results in a negative NPV. The task for management is to then assess whether or not there is possibility of events occurring which will lead to a negative NPV. Management should

also pay special attention towards the control of those variables to which NPV is particularly sensitive if a project is accepted.

Illustration

K Ltd is considering a project with the following cash flows.

Year	0	1	2
Initial investment	(7,000,000)	-	-
Variable costs		(2,000,000)	(2,000,000)
Cash inflows (650,000 units at £10 per unit)		6,500,000	6,500,000
Net cash flows	7,000,000	4,500,000	4,500,000
Cost of capital is 8%			

Measure the sensitivity of the project to changes in the variables given.

Year	Investment £	Variable costs	Cash flows £	PV factor at 8%	PV flows £
0	(7,000,000)	-	-	1.000	(7,000,000)
1-2		2,000,000		1.783	(3,566,000)
1-2			6,500,000	1.783	11,589,500
				NPV	£1,023,500

Without further analysis, the project is worthwhile. Changes in cash flows would need to occur before the project can be rejected

Using the breakeven point for sensitivity analysis,

- a) **Initial investment** would have to increase by £1,023,500 for the project to have NPV of zero. Hence initial investment would increase by

$$\frac{1,023,500}{7,000,000} \times 100 = 14.6\%$$

$$\frac{1,023,500}{7,000,000}$$

b) Sales Volume

If sales volume reduces, variable costs would also have to reduce, hence we use the contribution. The present value of contribution would have to reduce to 7,000,000 before NPV becomes zero. This gives an annual contribution of

$$\frac{7,000,000}{1.783} = 3,925,967$$

The decline would be $4500,000 - 3925967 = £574032$.

This would give total revenue of $574032 \times \frac{6,500,000}{4,500,000} = £829157$

Total number of units would hence be $\frac{829156}{1} = 82916 \text{ Units}$

10

Sensitivity would be $\frac{82916}{650,000} \times 100 = 12.8\%$

650,000

OR simply

$$\frac{1,023,500}{(11,589,500 - 3,566,000)} \times 100 = 12.8\%$$

c) Selling price

If sales volume is 650,000 per annum, total sales would have to reduce to 10,566,000 for NPV to be Zero. This gives a future value of 10,566,000 per annum i.e. 5925967

1.783

This would represent a price of $5925967/650,000 = £9.12$ per unit

A reduction of $\frac{10-9.12}{9.12} \times 100 = 8.8\%$

1

Using the breakeven point for sensitivity analysis,

a) **Initial investment** would have to increase by £1,023,500 for the project to have NPV of zero. Hence initial investment would increase by

$$\frac{1,023,500}{7,000,000} \times 100 = 14.6\%$$

b) **Sales Volume**

If sales volume reduces, variable costs would also have to reduce, hence we use the **contribution**. The present value of contribution would have to reduce to 7,000,000 before NPV becomes zero.

$$\frac{1,023,500}{(11,589,500 - 3,566,000)} \times 100 = 12.8\%$$

c) **Selling price**

If sales volume is 650,000 per annum, total sales would have to reduce to 10,566,000 for NPV to be Zero.

$$\frac{1,023,500}{11,589,500} = 0.088$$
$$0.088 \times 100 = 8.8\%$$

1

d) **Variable costs**

Total variable cost would have to increase by 1,023,500 for NPV to be zero that is an annual increase of

$$\frac{1,023,500}{3,566,000} = 0.2870$$
$$0.2870 \times 100 = 28.7\%$$

e) **Variable costs**

Total variable cost would have to increase by 1,024,000 for NPV to be zero that is an annual increase of $\frac{1,024,000}{1.783} = 574,033$

1.783

$$\text{That would be an increase of } \frac{574,033}{2,000,000} \times 100 = 28.7\%$$

f) **Cost of capital**

To determine the sensitivity of cost of capital, we calculate the IRR of the project. Trying discount rates 15% and 20%.

Year	Net cash flows	Discount factor at 15%	PV cash flows	Discount factor at 20%	PV cash flow

	£000	£000	£000		£000
0	(7000)	1.000	(7000)	1.000	(7000)
1-2	4500	1.626	7317	1.528	6878
		NPV	317		(124)

Using

$$\frac{N_1 R_2 - N_2 R_1}{N_1 - N_2} = \frac{(317 \times 0.2) + (124 \times 0.15)}{317 + 124} \times$$

$$\frac{82}{441} \times 100 = 18.6\%$$

$$18.6 - 8 \times 100 = 132.5\%$$

$$8$$

The NPV would therefore have to increase by

$$18.6 - 8 \times 100 = 132.5\% \quad \text{for NPV to become zero}$$

$$8$$

If we are to rank the variables in order of sensitivity, then

1. Selling price
2. Sales volume
3. Initial investment
4. Variable costs
5. Cost of capital

Illustration 2

Simple Ltd is considering a project with the following cash flows

Year	Purchase of 1 plant	Running costs	Savings
0	(7000)		
1		2,000	6,000

2		2,500	7,000

The cost of capital is 8%. Measure the sensitivity of the project to changes in the level of expected costs and savings.

SOLUTION

The PV of the cash flows is as follows:

Year	PV factors at 8%	PV of Purchase	PV of running costs	PV of savings	PV of cash flows
0	1.000	(7,000)			(7,000)
1	0.926	-	(1,852)	5,556	3,704
2	0.857	-	(2,143)	5,999	3,856
		(7,000)	3,995	11,555	560

The changes that would need to occur for NPV to be zero are:

- Plant cost would need to increase by a PV of 560 that is by $\frac{560}{7,000} \times 100 = 8\%$
- Running costs would need to increase by a PV of 560 that is by

$$\frac{560}{3,995} \times 100 = 14\%$$

$$\frac{560}{11,555} \times 100 = 4.8\%$$

- Savings would need to fall by a PV of 560, that is by $\frac{560}{11,555} \times 100 = 4.8\%$

Hence savings are the most sensitive followed by plant cost and then running costs.

Read about strengths and weaknesses of sensitivity analysis.

Certainty Equivalent Approach

Here the expected cash flows of the project are converted to risk less equivalent amounts. The greater the risk of an expected cash flow, the smaller the certainty equivalent values for receipts or the larger the certainty equivalent value for payments.

Illustration

DA Ltd, whose cost of capital is 10%, is considering a project with the following expected cash flows.

Year	Discount factor at 10%	Cash flows	PV cash flows
0	1.000	(9000)	(9000)
1	0.909	7000	6363
2	0.826	5000	4130
3	0.751	5000	3755
			5248

Due to the uncertainty surrounding the economy, managements has decided to reduce the future receipts to their certainty equivalent by taking only 70% 60% and 50% of the receipts in the years 1, 2, and 3 respectively. On the basis of this additional information, assess the viability of the project.

SOLUTION

The risk adjusted NPV of the project is as follows

Year	Cash flow	PV factor	PV cash flows
0	(9000)	1.000	(9000)
1	4900	0.909	4454
2	3000	0.826	2478
3	2500	0.751	1878
			(190)

Read about merits and demerits of certainty equivalent approach

Probability Analysis

Here you compute the Expected Values from the projected cash flows and the probabilities of achieving those projections. After Estimating various cash flows and the probability of realising those cash flows, then expected values can be computed.

Illustration

A company is considering a project involving the outlay of £300,000 which it estimates will generate cash flows over its two year life at the probabilities shown in the table below.

Year 1

Cash flow £	Probability
100,000	0.25
200,000	0.50
300,000	<u>0.25</u>
	<u>1.00</u>

The company's investment criterion for this type of project is 10% DCF.

You are required to calculate the expected value of the project

Simulation Models

The Simulation technique allows the person appraising to incorporate many combinations of variables that may cause changes in the possible outcomes. It is the equivalent of sensitivity analysis though with a number of variables changing at once. Simulation is facilitated by use of computers.

ASSET REPLACEMENT DECISIONS

Once a decision has been made to acquire an asset then we have to plan the replacement of the asset i.e. when and how frequently to replace it. When an asset is to be replaced by an identical asset, the problem is to decide the optimum interval between replacements.

Non- Identical Replacement

If an asset is to be replaced by one of a different type, then we need to decide when the existing asset should be replaced rather than how frequently it should be replaced.

In order to find the optimum date for replacement, we first calculate the annual cost and then follow the following.

- a) Calculate the NPV of the equivalent annual cost in perpetuity for the new machine.

- b) Calculate the total net present value of the various options taking into account
- i. The cost in perpetuity of the new machine
 - ii. The final expenses of the old machine and any residual sales proceeds from the old machine.

Illustration

Assume J Ltd.'s machine (Illustration on LCM) is a new machine and will be introduced to replace a non-identical machine that is nearing the end of its life and has a maximum remaining life of three years. The organisation wishes to decide when the best time to replace the old machine is and estimates of relevant costs have been drawn up as follows

Year	Residual of current machine	Extra expenditure and opportunity costs of keeping the existing machine in operation during the year
	£	£
0	8500	-
1	5000	9,000
2	2500	12,000
3	0	15,000

Calculate the best time to replace the existing machine.

Solution

The optimum replacement cycle is 3 years. Best time to replace the existing machine will be the option that gives the lowest NPV of cost in perpetuity, for both the existing machine and the machine that eventually replaces it.

Computing the NPV of the cost in perpetuity of the new machine using $\frac{a}{r}$

$$\text{PV of cost} = \frac{\text{£ } 17,625}{0.1} = \text{£ } 176,250$$

Calculating the present values of each replacement option.

These cash flows show the present value of cost in perpetuity of the new machine, the running costs of the existing machine and the resale value of the existing machine, at the end of years 0, 1, 2 or 3 as appropriate.

Year	Replace new	Replace in 1 year	Replace in 2 years	Replace in 3 years
	£	£	£	£
0	(176250)			
	8500			
1	-	(176250)		
		(9000)	(9000)	(9000)
		5000		
2	-	-	(176250)	
			(12000)	(12000)
			2500	
3				(176,250)
				(15,000)

The PV's of each replacement option are as follows:

	Year	Cash flow	Discount factor at 10%	PV
		£		£
Replace now	0	(176,250)		
		<u>8,500</u>		
		(167,750)	1.000	(167,750)
Replace in	1	(176,250)		
One year		(9,000)		
		<u>5,000</u>		
		(180,250)	0.909	(163,847)
Replace in 2 years	1	(9000)	0.909	(8,181)

	2	(185,750)	0.826	(153,430)
				(161,611)
Replace in 3 years	1	(9000)	0.909	(8,181)
	2	(12,000)	0.826	(9,912)
	3	(191,250)	0.751	(143,629)
				(161,722)

The recommended policy is to replace the existing machine in two years' time because this has the lowest total PV of cost in perpetuity.

In investment appraisal we use cash flows to determine the viability.

The Points to take into consideration in generating cash flows include

- Only relevant cash flows should be used in the Evaluation of a project/Investment. Non relevant costs such as sunk costs are irrelevant.
- Opportunity cost being a relevant cost should be considered in the Evaluation of a project.
- Interest payments should not form part of the cash flows because this is already included in the discount factor i.e. the time value of money will reflect the interest payment. Like wise any relief as a result of interest payments should also be ignored. (The exception to this is in case of leasing or hire purchase).
- Tax payments are cash flows only when they are paid. Capital allowance and tax losses are cash inflows at the time when they reduce the tax payment.
- Non cash flow charges like depreciation are not relevant costs though the tax impact should be taken into consideration.
- Dividends to be paid to shareholders are irrelevant cash flows.

CAPITAL RATIONING

Capital rationing is a situation where a company has a limited amount of capital to invest in potential projects, such that the different possible investments need to be compared with one

another in order to allocate the capital available most effectively. This means that the company will not be able to invest into all projects with positive NPVs because there is not enough capital for all the investments.

There are two causes/types of capital rationing,

- a) Soft (internal) capital rationing, which is mainly due to management's unwillingness to raise more funds to finance investments. The reasons may include fear of outsiders gaining control of a business, fear of large fixed interest payments, if the firm's budget limits spending etc. Management may adopt conservative growth and financial policies especially where an economy is facing of coming from a depression.
- b) Hard capital (external) rationing is one where the firm's ability to raise funds is limited by external factors such as where lending institutions put a limit to the amount that can be raised by a firm, where the company's share prices are depressed, where the cost of getting additional funds is too high.

The effects of these causes can be reduced by the firm through:

- i.) Seeking joint venture partners to share projects
- ii.) Licensing or franchising agreements with other enterprises
- iii.) Contracting out parts of a project to reduce the initial capital out lay required.

Other means may include

- Sale and lease back of property
- Seeking Grant aid.
- Adopting more effective capital management techniques.

Capital Rationing can occur either in a **single period** or in a **multiple periods**

Single period capital rationing is where a firm experiences a shortage of funds 'now' but funds are expected to be freely available in all later periods

When analysing a project with capital rationing, there are assumptions to take into consideration, these are

- i.) If a company does not accept and undertake a project during a period of capital rationing, the opportunity to undertake it is lost i.e. the project cannot be postponed.

- ii.) There is complete certainty about the outcome of each project, so that the choice between projects is not affected by considerations of risk.
- iii.) Either projects are Divisible or indivisible. Projects are divisible if either the whole project or part of the project can be undertaken. An indivisible project is one which either must be undertaken in its entirety or not at all.

Divisible projects

In capital rationing where projects are divisible, the approach adopted is to rank all investment opportunities so that the NPVs can be maximised from the use of the available funds. The ranking should not be based on the absolute NPVs but on the profitability index so that the most profitable projects are ranked highly.

Profitability index is the ratio of present value cash inflows to present value cash out flows.

Illustration

Stress Ltd is experiencing shortage of funds in its first year of operation; it has available funds of £60,000. The company has 3 investment opportunities whose cash flows in £ are as follows

Project	Year 0	Year 1	Year 2	Year 3	Year 4
A	(50,000)	(20,000)	20,000	40,000	40,000
B	(28,000)	(50,000)	40,000	40,000	20,000
C	(30,000)	(30,000)	30,000	40,000	10,000

The cost of capital is 10%. You are required to decide which projects should be undertaken in year 0 in view of the capital rationing, given that projects are divisible

Computing the NPV

	Out lay	Present Value Cash flows				
Project	Year 0	Year 1	Year 2	Year 3	Year 4	NPV
A	(50,000)	(18,180)	16,520	30,040	27,320	5,700
B	(28,000)	(45,450)	33,040	30,040	13,660	3,290

C	(30,000)	(27,270)	24,780	30,040	6,830	4,380
---	----------	----------	--------	--------	-------	-------

Project	PI	Ranking
A	1.114	3 rd
B	1.118	2 nd
C	1.146	1 st

The optimal investment policy would be as follows

Ranking	Project	Year 0 out lay	NPV
1	C	30,000	4380
2	B	28,000	3290
3	A	2,000	<u>228</u>
	NPV		<u>7898</u>

Where the projects are **not divisible**, then by trial and error you determine the combination of projects that best utilise the available funds and provide the highest total NPV.

Read about – Capital rationing where projects can be postponed.

Problems of using profitability index.

TOPIC TWO

FINANCE IN THE WORLD OF UNCERTAINTY

Risk is defined as the degree of uncertainty. It is the possibility of events which are likely to affect or investment in the future. Risk can be caused by a number of factors which include the following:

- ✚ Change in economic conditions
- ✚ Change in country tax rates
- ✚ Political instability in the country
- ✚ Changes in the market conditions
- ✚ Changes in the borrowing interest rates
- ✚ Changes in the global economic conditions, etc

MEASURES OF RETURN AND RISK

The first measure is the **historical rate of return** on an individual investment over the time period the investment is held (that is, its holding period). Given the measures of historical rates of return, the traditional measures of risk for a historical time series of returns (that is, the variance and standard deviation) are considered.

The second measure is the **expected rate of return** for an investment. Obviously, such an estimate contains a great deal of uncertainty.

When evaluating alternative investments for inclusion in a portfolio, you will often be comparing investments with widely different prices. As an example, you might want to compare a \$10 stock that pays no dividends to a stock selling for \$150 that pays dividends of \$5 a year. To properly evaluate these two investments, you must accurately compare their historical rates of returns.

When we invest, we defer current consumption in order to add to our wealth so that we can consume more in the future. Therefore, when we talk about a return on an investment, we are concerned with the change in wealth resulting from this investment. This change in wealth can be either due to cash inflows, such as interest or dividends, or caused by a change in the price of the asset (positive or negative).

Example

If you commit **\$200** to an investment at the beginning of the year and you get back **\$220** at the end of the year, what is your return for the period? The period during which you own an investment is called its holding period, and the return for that period is the holding period return (HPR).

$$\begin{aligned}\text{HPR} &= \frac{\text{Ending Value of Investment}}{\text{Beginning Value of Investment}} \\ &= \frac{\$220}{\$200} = 1.10\end{aligned}$$

This value will always be zero or greater that is, it can never be a negative value. A value greater than 1.0 reflects an increase in your wealth, which means that you received a positive rate of return during the period. A value less than 1.0 means that you suffered a decline in wealth which indicates that you had a negative return during the period. An HPR of zero indicates that you lost all your money.

Although HPR helps us express the change in value of an investment, investors generally evaluate returns in percentage terms on an annual basis. This conversion to annual percentage rates makes it easier to directly compare alternative investments that have markedly different characteristics.

The first step in converting an HPR to an annual percentage rate is to derive a percentage return, referred to as the holding period yield (HPY). The HPY is equal to the HPR minus 1.

$$\text{HPY} = \text{HPR} - 1$$

In our example:

$$\begin{aligned}\text{HPY} &= 1.10 - 1 = 0.10 \\ &= 10\%\end{aligned}$$

To derive an *annual* HPY, you compute an annual HPR and subtract 1. Annual HPR is found by:

$$\text{Annual HPR} = \text{HPR}^{1/n}$$

Where: **n** = number of years the investment is held

Example;

Consider an investment that cost \$250 and is worth \$350 after being held for two years:

$$\begin{aligned}\text{HPR} &= \frac{\text{Ending Value of Investment}}{\text{Beginning Value of Investment}} = \frac{\$350}{\$250} \\ &= 1.40 \\ \text{Annual HPR} &= 1.40^{1/n} \\ &= 1.40^{1/2} \\ &= 1.1832 \\ \text{Annual HPY} &= 1.1832 - 1 = 0.1832 \\ &= 18.32\%\end{aligned}$$

If you experience a decline in your wealth value, the computation is as follows:

$$\begin{aligned}\text{HPR} &= \frac{\text{Ending Value}}{\text{Beginning Value}} = \frac{\$400}{\$500} = 0.80 \\ \text{HPY} &= 0.80 - 1.00 = -0.20 = -20\%\end{aligned}$$

A multiple year loss over two years would be computed as follows:

$$\begin{aligned}\text{HPR} &= \frac{\text{Ending Value}}{\text{Beginning Value}} = \frac{\$750}{\$1,000} = 0.75 \\ \text{Annual HPR} &= (0.75)^{1/n} = 0.75^{1/2} \\ &= 0.866 \\ \text{Annual HPY} &= 0.866 - 1.00 = -0.134 = -13.4\%\end{aligned}$$

In contrast, consider an investment of \$100 held for only six months that earned a return of \$12:

$$\begin{aligned}\text{HPR} &= \frac{\$112}{\$100} = 1.12 (n = 0.5) \\ \text{Annual HPR} &= 1.12^{1/.5} \\ &= 1.12^2 \\ &= 1.2544 \\ \text{Annual HPY} &= 1.2544 - 1 = 0.2544 \\ &= 25.44\%\end{aligned}$$

Note that, we made some implicit assumptions when converting the HPY to an annual basis. This annualized holding period yield computation assumes a constant annual yield for each year. In the two-year investment, we assumed an 18.32% rate of return each year, compounded. In the partial year HPR that was annualized, we assumed that the return is compounded for the whole year.

That is, we assumed that the rate of return earned during the first part of the year is likewise earned on the value at the end of the first six months. The 12% rate of return for the initial six months compounds to 25.44 % for the full year. Because of the uncertainty of being able to earn the same return in the future six months, institutions will typically not compound partial year results.

NB: The ending value of the investment can be the result of a positive or negative change in price for the investment alone (for example, a stock going from \$20 a share to \$22 a share), income from the investment alone, or a combination of price change and income. Ending value includes the value of everything related to the investment.

COMPUTING HISTORICAL MEAN RETURNS

Single Investment:

Given a set of annual rates of return (HPY's) for an individual investment, there are two summary measures of return performance. The first is the Arithmetic Mean return, the second the geometric mean return. To find the Arithmetic Mean (AM), the sum (Σ) of annual HPY's is divided by the number of years (n) as follows:

$$AM = \Sigma HPY / n$$

Where: ΣHPY = the sum of annual holding period yields.

An alternative computation, the geometric mean (GM), is the n th root of the product of the HPR's for n years.

$$GM = [\pi HPR]^{1/n} - 1$$

where:

π = the product of the annual holding period returns as follows:

$$(HPR_1) \times (HPR_2) \dots (HPR_n)$$

To illustrate these alternatives, consider an investment with the following data:

YEAR	BEGINNING VALUE	ENDING VALUE	HPR	HPY
1	100.0	115.0	1.15	0.15
2	115.0	138.0	1.20	0.20
3	138.0	110.4	0.80	-0.20

$$\begin{aligned}
 \text{AM} &= [(0.15) + (0.20) + (-0.20)]/3 \\
 &= 0.15/3 \\
 &= 0.05 = 5\%
 \end{aligned}$$

$$\begin{aligned}
 \text{GM} &= [(1.15) \times (1.20) \times (0.80)]^{1/3} - 1 \\
 &= (1.104)^{1/3} - 1 \\
 &= 1.03353 - 1 \\
 &= 0.03353 = 3.353\%
 \end{aligned}$$

Investors are typically concerned with long-term performance when comparing alternative investments. GM is considered a superior measure of the long-term mean rate of return because it indicates the compound annual rate of return based on the ending value of the investment versus its beginning value.

Specifically, using the prior example, if we compounded 3.353 percent for three years, $(1.03353)^3$, we would get an ending wealth value of 1.104.

Although the arithmetic average provides a good indication of the expected rate of return for an investment during a future individual year, it is biased upward if you are attempting to measure an asset's long-term performance. This is obvious for a volatile security.

Consider, for example, a security that increases in price from \$50 to \$100 during year 1 and drops back to \$50 during year 2. The annual HPYs would be:

YEAR	BEGINNING VALUE	ENDING VALUE	HPR	HPY
1	50	100	2.00	1.00
2	100	50	0.50	-0.50

This would give an AM rate of return of:

$$\begin{aligned}
 [(1.00) + (-0.50)]/2 &= 0.50/2 \\
 &= 0.25 = 25\%
 \end{aligned}$$

This investment brought no change in wealth and therefore no return, yet the AM rate of return is computed to be 25%

The GM rate of return would be:

$$\begin{aligned}(2.00 \times 0.50)^{1/2} - 1 &= (1.00)^{1/2} - 1 \\ &= 1.00 - 1 = 0\%\end{aligned}$$

This answer of a **0%** rate of return accurately measures the fact that there was no change in wealth from this investment over the two-year period.

When rates of return are the same for all years, the GM will be equal to the AM. If the rates of return vary over the years, the GM will always be lower than the AM. The difference between the two mean values will depend on the year-to-year changes in the rates of return. Larger annual changes in the rates of return that is; more volatility will result in a greater difference between the alternative mean values.

EXPECTED RETURN OF AN INVESTMENT

The expected return from an investment is defined as:

$$\begin{aligned}\text{Expected Return} &= \sum_{i=1}^n (\text{Probability of Return}) \times (\text{Possible Return}) \\ E(R_i) &= [(P_1)(R_1) + (P_2)(R_2) + (P_3)(R_3) + \cdots + (P_n)R_n] \\ E(R_i) &= \sum_{i=1}^n (P_i)(R_i)\end{aligned}$$

Example One Calculate the expected return for each project in tables below:

Year One

Returns (X)	Probability (P)	
9,000	0.2	
5,000	0.3	
4,000	0.5	
Expected Return		

Year Two

Returns (X)	Probability (P)	
8,000	0.5	
7,000	0.4	
9,000	0.1	
Expected Return		

Measuring risk of expected return

We can calculate the expected rate of return and evaluate the uncertainty or risk of an investment by identifying the range of possible returns from that investment and assigning each possible return a weight based on the probability that will occur.

Although the graph can be used to visualize the dispersion of possible returns most investors want to quantify this dispersion using statistical techniques. These statistical measures allow investors to compare the return and the risk measures for alternative investments directly.

Two possible measures of risk have received support in theoretical work on portfolio theory: The *variance* and the *standard deviation* of the estimated distribution of expected returns.

Variance

$$\sigma^2 = \sum_{i=1}^n (P_i) [R_i - E(R)]^2$$

σ^2 = Variance

R_i = Return in period i

$E(R)$ = Expected Return

P_i = Probability of R_i occurring

The larger the variance for an expected of return, the greater the dispersion of expected returns and the greater the uncertainty or risk of the investment. The variance for perfect certainty example would be zero.

Standard deviation

The standard deviation is the square root of the variance:

Formula

$$\begin{aligned}\sigma &= \sqrt{\sum_{i=1}^n P_i [R_i - E(R_i)]^2} \\ &= \left(\sum_{i=1}^n P_i [R_i - E(R_i)]^2 \right)^{\frac{1}{2}}\end{aligned}$$

Standard Deviation is a measure of dispersion around the mean. The higher the standard deviation, the greater the dispersion of returns around the mean and the greater the risk

A relative measure of risk

If conditions for two or more investment alternatives are not similar that is, if there are major differences in the expected rates of return. It is necessary to use a measure of relative variability to indicate risk per unit of expected return. A widely used relative measure of risk is the Coefficient of Variation (CV), calculated as follows.

Formula

$$CV = \frac{\text{Standard Deviation of Returns}}{\text{Expected Rate of Return}} \\ = \frac{\sigma_i}{E(R)}$$

This measure of relative variability and risk is used by financial analysts to compare alternative investments with widely different rates of return and Standard deviation of returns.

RISK MEASURES OF HISTORICAL RETURNS

To measure the risk for a series of historical rates of returns, we use the same measures as for expected returns (variance and standard deviation) except that we consider the historical holding period yields (HPYs) as follows:

$$\sigma^2 = \sum_{i=1}^n [HPY_i - E(HPY)]^2 / n$$

Where:

σ^2 = the variance of the series

HPY_i = the holding period yield during period i

$E(HPY)$ = the expected value of the holding period yield that is equal to the arithmetic mean of the series

n = the number of observations

The standard deviation is the square root of the variance. Both measures indicate how much the individual HPYs over time deviated from the expected value of the series.

Expected return of the Portfolio

The expected return of the portfolio is calculated as;

$$E(R_P) = W_X E(R_X) + W_Y E(R_Y)$$

Where;

W_X = Weight of investment in the first project

W_Y = Weight of Investment in the second project

$E(R_X)$ = Expected return of the first project

$E(R_Y)$ = Expected return of the second project

$E(R_p)$ = Expected return of the portfolio.

COMBINED INVESTMENT (PORTFOLIO) RISK

Good combination of investment portfolio is likely to benefit the investors since risks are minimized. Wrong combination of investment portfolio will increase risks and possibility of business failure. There are three scenarios of investment correlations which can guide the investor in making proper decisions on the best combination to choose.

Positive correlation

Positive or direct correlation refers to the movement of variables in the same direction. The correlation is said to be positive or direct when the increase in the value of one variable is accompanied by an increase in the value of the other variable.

Negative correlation

Investments are negatively correlated if there is no direct relationship in their performance. *Example*, if you had shares in one company that makes Umbrella's and in another company which sells ice cream, the weather will affect the two companies differently.

No correlation

In this scenario, there is no relationship between two investments. The performance of one investment will be independent of the other.

Measuring investments relationships:

- A figure close to + 1 indicates high positive correlation
- A figure close to -1 indicates negative correlation
- A figure of 0 indicates no correlation between investments.

Coefficient of Correlation of the two Asset Case Investments (Securities (X and Y) is given by:

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2} \sqrt{n \sum y^2 - (\sum y)^2}}$$

Example one

Given two securities A and B whose returns in the possible states of the economy are as follows; calculate the co-variance between the returns of the two securities.

State	Probability (P)	Return of A (%)	Return of B (%)
1	0.5	10	5
2	0.3	8	12
3	0.2	6	7

Example Two

An investor has invested his money in two securities A and B. The expected returns under different outcomes for each of the securities are expected to have the following information.

Security A

Security B

Outcomes	Returns	Probability	Returns	Probability
Worst Outcome	31%	0.3	15%	0.3
Most likely	26%	0.4	12%	0.4
Best	35%	0.3	20%	0.3

Assume that the investor needs to invest 40% of his fund in security A and 60% in security B.

- Calculate the Expected Return of each project
- Calculate the Standard Deviation of each project
- Calculate the Coefficient of Correlation
- Calculate the Covariance between project A and B

TOPIC THREE

SOURCES OF FINANCE

LEARNING OUTCOMES:

At the end of this topic, a student will be able to:

- Explain short term sources of finance
- Explain the long term source of finance

PREAMBLE

Often the hardest part of starting a business is raising the money to get going. The entrepreneur might have a great idea and clear idea of how to turn it into a successful business. However, if sufficient finance can't be raised, it is unlikely that the business will get off the ground. Sourcing money may be done for a variety of reasons. Traditional areas of need may be for capital asset acquirement - new machinery or the construction of a new building or depot. The development of new products can be enormously costly and here again capital may be required. Normally, such developments are financed internally, whereas capital for the acquisition of machinery may come from external sources.

SHORT-TERM SOURCES OF FINANCE

a) Finance from operations/ Retained earnings

Retained earnings means that part of trading profits which is not distributed in the form of dividends but retained by directors for future expansion of the company. Retained earnings ultimately come back to the equity shares in the form of enhanced dividend or capital gains. The portion of the profits which is not distributed among the shareholders but is retained and is used in business is called retained earnings or ploughing back of profits. Companies are required to transfer a part of their profits in reserves.

Advantages of Retained Earnings

- Ready Availability: Being an internal source, these earnings are readily available to the management and directors don't have to ask outsiders for finance.

- Cheaper than external equity: Retained earnings are cheaper than external equity because the floatation costs, brokerage costs, underwriting commission and other issue expenses are eliminated.
- No ownership dilution: Relying on retained earnings eliminates the fear of ownership dilution and loss of control by the existing shareholders.
- Positive Connotation: Retained earnings carry positive connotation as compared to equity issue as far as stock market is concerned.
- No expenses are incurred when capital is available from this source. There is no obligation on the part of the company either to pay interest or pay back the money. It can safely be used for expansion and modernization of business.
- A company which has enough reserves can face ups and downs in business. Such companies can continue with their business even in depression, thus building up its goodwill.
- Shareholders may get dividend out of reserves even if the company does not earn enough profit. Due to reserves, there is capital appreciation, i.e. the value of shares goes up in the share market.
- Increase financial strength: Through ploughing back of profits, companies increase their financial strength. Companies may throw out their competitors from the market and monopolize their position.

Disadvantages of retained earnings

- Limited finance: The amount which can be raised by way of retained earnings will be limited to an extent only. Keeping in view a stable dividend policy, the directors can't exhaust the whole balance retained. As a result, the variability of profit after tax is substantially transmitted to retained earnings.
- High opportunity cost: The retained earnings are nothing but sacrifice of profits made by equity shareholders. In other words, retained earnings are dividend foregone by equity shareholders. This sacrifice increases the opportunity cost of retained earnings.
- This method of financing is possible only when there are huge profits and that too for many years.
- When funds accumulate in reserves, bonus shares are issued to the shareholders to capitalize such funds. Hence the company has to pay more dividends. By retained earnings the real capital does not increase while the liability increases. In case bonus shares are not issued, it may create a situation of under-capitalization because the rate of dividend will be much higher as compared to other companies.

- Encourage extravagant spending: Capital accumulated through retained earnings encourages management to spend carelessly.

b) Trade credit

This is always obtained when the suppliers offer credit facilities to the firm by not demanding immediate payment for the goods and services supplied to the business.

Advantages of Trade Credit

- It has no explicit costs
- It is flexible; it only needs an understanding between the firm and the supplier.
- There are no complicated modalities in securing trade credit for example collateral securities.

Disadvantages of trade credit

- Higher price may lead to charging for the goods and service just because there is no immediate payment of cash.
- The firm may forego cash discounts because of credit transactions.
- Over stretching of the credit period may lead to poor credit rating.

c) Delay deferred payments

The firm may defer or delay some payments for example wages may be paid at later date, taxation can be paid after for example six months. This is an indirect source of finance.

d) Bank credit/overdraft

A common source of short term financing for many businesses is a bank overdraft. They are normally provided by clearing banks and represent permission by the bank to write the cheque even though the firm has insufficient funds deposited in the account to meet the cheque needs. The firm is allowed to withdraw more money than what is available on the account.

Advantages of bank overdrafts

- Flexibility- they can be used as required. It is dependent on the client and the bank relationship.
- Cheapness-interest is usually 2-5% by most banks above the base rate (all loan interest is a tax deductible expense).
- There is no collateral security needed.

Disadvantages of bank overdrafts

- Interest rates vary with the bank base rates.
- Overdrafts are legally repayable on demand. Normally the bank will give customers assurance that they can rely on the facility for ascertain time period, say six months.
- Security is usually required by way of fixed or floating charges on assets or sometimes, in private companies and partnership, by personal guarantees from owners especially when large amount are overdrawn.

e) Factoring of debtors

Factoring involves taking over responsibilities for collecting the company's debts to a specialist institution (the factor). The finance house/ factor undertake to collect the amounts from debtors and bear the bad debts losses when they occur.

Advantage of debtor factoring

- Taking over the running of the client's ledgers hence reducing on the cost by the company.
- Offering 100% protection against the bad debts instead of being incurred by the company.
- Readily finance can be obtained from the factors in form advances, the security for which are the debtor's balances owing.

Disadvantages of debt factoring

- To take over the running of the sales ledger and the give bad debt protection, the factor will require a fee f about 1.5-2.5% of turnover.
- Usually not all the amount of debt will be collected and the timing of collection may be uncertain.
- Risk of exposure of the company vital information about its sales ledger accounts to the factor.

f) Money market based finance

This involves sourcing short-term finance from the money market by selling short-term securities for example bill of exchange, treasury bills, promissory notes, certificate of deposit, and short-term government bonds. For efficiency there is need for an efficiently operating market.

g) Miscellaneous and sale of assets

Other sources of short-term finance may include; loan from individuals. Sale of Assets is another internal source of finance is the sale of assets. Whenever a business sells of its assets and the cash generated is used internally for financing the capital needs, we call it an internal source of finance by sale of assets. It can work as a short term or long term finance depending on what kind of assets is sold. Say, selling a car can cater short term and smaller finance needs and selling land, buildings, or machinery can cater to long term and bigger finance needs.

h) Leasing and hire purchase finance

Leasing is a means of financing which involve the use of capital equipment and other noncurrent assets such as buildings, motor vehicles, the underlying principle being that use is more important than ownership. It is a medium term financial arrangement, usually for one to ten years. There are usually two types of lease that is to say finance and operating lease. Hire purchase agreements and leasing provide finance for the acquisition of specific assets such as cars, equipment and machinery involving a deposit and repayments over, typically, three to ten years. Technically, ownership of the asset remains with the lessor whereas title to the goods is eventually transferred to the hirer in a hire purchase agreement.

A lease is an agreement between two parties, the "lessor" and the "lessee". The lessor owns a capital asset, but allows the lessee to use it. The lessee makes payments under the terms of the lease to the lessor, for a specified period of time. Leasing is, therefore, a form of rental. Leased assets have usually been plant and machinery, cars and commercial vehicles, but might also be computers and office equipment. There are two basic forms of lease: "operating leases" and "finance leases".

Types of leases

Operating leases: Operating leases are rental agreements between the lessor and the lessee whereby:

- a) The lessor supplies the equipment to the lessee
- b) The lessor is responsible for servicing and maintaining the leased equipment
- c) The period of the lease is fairly short, less than the economic life of the asset, so that at the end of the lease agreement, the lessor can either
 - i) Lease the equipment to someone else, and obtain a good rent for it, or
 - ii) Sell the equipment secondhand.

Finance leases: Finance leases are lease agreements between the user of the leased asset (the lessee) and a provider of finance (the lessor) for most, or all, of the assets expected useful life. Suppose that a company decides to obtain a company car and finance the acquisition by means of a finance lease. A car dealer will supply the car. A finance house will agree to act as lessor in a finance leasing arrangement, and so will purchase the car from the dealer and lease it to the company. The company will take possession of the car from the car dealer, and make regular payments (monthly, quarterly, six monthly or annually) to the finance house under the terms of the lease.

Advantages of using leasing & HP as a source of finance

The use of hire purchase or leasing is a popular method of funding the acquisition of capital assets. However, these methods are not necessarily suitable for every business or for every asset purchase. There are a number of advantages to be made, as described below:

- ***Certainty:*** One important advantage is that a hire purchase or leasing agreement is a medium term funding facility, which cannot be withdrawn, provided the business makes the payments as they fall due. The uncertainty that may be associated with alternative funding facilities such as overdrafts, which are repayable on demand, is removed.
- ***Budgeting:*** The regular nature of the hire purchase or lease payments (which are also usually of fixed amounts as well) helps a business to forecast cash flow. The business is able to compare the payments with the expected revenue and profits generated by the use of the asset.
- ***Fixed rate finance:*** In most cases the payments are fixed throughout the hire purchase or lease agreement, so a business will know at the beginning of the agreement what their repayments will be. This can be beneficial in times of low, stable or rising interest rates but may appear expensive if interest rates are falling.
- ***The effect of security:*** Under both hire purchase and leasing, the finance company retains legal ownership of the equipment, at least until the end of the agreement. This normally gives the finance company better security than lenders of other types of loan or overdraft facilities. The finance company may therefore be able to offer better terms.
- ***Maximum finance:*** Hire purchase and leasing could provide finance for the entire cost of the equipment. There may however, be a need to put down a deposit for hire purchase or to make one or more payments in advance under a lease. It may be possible for the business to 'trade-in' other assets which they own, as a means of raising the deposit.

- **Tax advantages:** Hire purchase and leasing give the business the choice of how to take advantage of capital allowances. If the business is profitable, it can claim its own capital allowances through hire purchase or outright purchase.

Disadvantages of leasing and hire purchase

- However, it should be borne in mind that both hire purchase and leasing agreements are long term commitments. It may not be possible, or could prove costly, to terminate them early.
- On some agreements, such as those for a longer term, the finance company may offer the option of variable rate agreements. In such cases, rentals or installments will vary with current interest rates; hence it may be more difficult to budget for the level of payment.
- The decision to provide finance to a small or medium sized business depends on that business' credit standing and potential. Because the finance company has security in the equipment, it could tip the balance in favour of a positive credit decision.

i) Borrowing from friends and family

This is also common. Friends and family who are supportive of the business idea provide money either directly to the entrepreneur or into the business. This can be quicker and cheaper to arrange (certainly compared with a standard bank loan) and the interest and repayment terms may be more flexible than a bank loan. However, borrowing in this way can add to the stress faced by an entrepreneur, particularly if the business gets into difficulties.

j) Government assistance

The government provides finance to companies in cash grants and other forms of direct assistance, as part of its policy of helping to develop the national economy, especially in high technology industries and in areas of high unemployment.

k) Payroll Financing

Payroll lenders provide short-term loans for qualified businesses of up to \$100,000. To qualify, your business must have to have an established track record and a specific level of proven sales revenue. Money can be used for a variety of expenditures. Closely examine the repayment terms of various service providers to ensure you're selecting the best option for your business.

LONG TERM SOURCES OF FINANCE

When a company is growing rapidly, for example when contemplating investment in capital equipment or an acquisition, its current financial resources may be inadequate. Few growing companies are able to finance their expansion plans from cash flow alone. They will therefore need to consider raising finance from other external sources. Long-term source of finance is

always sought by the company capital expenditures especially to expand capacity, replacement of the existing capacity, facilitation of research and development, maintenance of the existing capacity. The main source may include;

a) Funds from operations

These are source of finance as reflected in accumulated reserves. The main advantages of reserves are that they are cheap and reliable source of long-term fund; they have no explicit costs except the indirect cost of dividends due to shareholders. They are very flexible - management has complete control over how they are reinvested and what proportion is kept rather than paid as dividends. They do not dilute the ownership of the company

Reason for paying and not paying dividends

Dividends are corporate earnings that companies pass on to their shareholders. There are a number of reasons why a corporation might choose to pass some of its earnings on as dividends. There are also a number of reasons why it might prefer to reinvest all of its earnings back into the company.

- A company that is still growing rapidly usually won't pay dividends, because it wants to invest as much as possible into further growth. Even a mature firm that believes it will do a better job of increasing its value (and therefore a better job of increasing its share price) by reinvesting its earnings will choose not to pay dividends.
- Companies that don't pay dividends might use the money to start a new project, acquire new assets, repurchase some of their shares or even buy out another company.
- Also, the choice to not pay dividends may be more beneficial to investors from a tax perspective. Dividends are taxable to investors as ordinary income, which means an investor's tax rate on dividends is the same as his marginal tax rate.
- Firms that choose to reinvest all of their earnings, instead of issuing dividends, may also be thinking about the high potential expense of issuing new stock. To avoid the risk of needing to raise money this way, they choose to keep all of their earnings.

However, for a mature company that doesn't need to reinvest as much in itself, and that has stable earnings, there are several reasons why issuing dividends can be a good idea.

- Many investors like the steady income associated with dividends, so they will be more likely to buy that company's stock. Investors also see a dividend payment as a sign of a company's strength and a sign that management has positive expectations for future earnings, which again makes the stock more attractive. A greater demand for a company's stock will increase its price.
- A company may also choose not to pay dividends because the decision to start paying dividends or to increase an existing dividend payment is a serious one. A company that eliminates or reduces its existing dividend payment may be viewed unfavorably and its stock price may decrease.

b) Ordinary share capital

These shares represent ownership and have no maturity date. Shareholders however have a voice in management (involvement in decision making). They also have a definite cost in form of dividends. These funds can only be obtained from the primary capital markets i.e. the market for original buyers and sellers of securities. Secondary, markets like the stock exchange only facilitate liquidity of these shares. These funds can be obtained through the following mechanisms: making a public offer, private placement, by action and bonus issue.

Advantages of Ordinary share capital finance

Ordinary share capital is the most important long-term source of financing. The main disadvantage to equity financing is that the investors become part-owners of the business, and thus gain a say in business decisions and thus they become decision maker for the business rather than lenders. It offers the following advantages to the company:

Permanent capital: Since ordinary shares are not redeemable, the company has no liability for cash outflow associated with its redemption. It is a permanent capital, and is available for use as long as the company goes.

Borrowing base: The ordinary share capital increases the company's financial base, and thus its borrowing limit. Lenders generally lend in proportion to the company's equity capital. By issuing ordinary shares, the company increases its financial capability. It can borrow when it needs additional funds.

Dividend payment discretion: A company is not legally obliged to pay dividend. In times of financial difficulties, it can reduce or suspend payment of dividend. Thus, it can avoid cash outflow associated with ordinary shares. In practice, dividend cuts are not very frequent. A company tries to pay dividend regularly. It cuts dividend only when it cannot manage cash to pay dividends

Disadvantages of share capital finance

Ordinary share capital has some disadvantages to the firm compared to other sources of finance;

Cost: Shares have a higher cost at least at two reasons: Dividends are not tax deductible as are interest payment, and flotation costs on ordinary shares are higher than those on debt.

Risk: Ordinary shares are riskier from investor's point of view as there is uncertainty regarding dividend and capital gains. Therefore, they require a relatively higher rate of return. This makes equity capital as the highest cost source of finance.

Earnings dilution: The issue of new ordinary shares dilutes the existing shareholders' earnings per share if the profits do not increase immediately in proportion to the increase in the number of ordinary shares. Earnings per share are higher than those on debt.

Ownership dilution: The issuance of new ordinary shares may dilute the ownership and control of the existing shareholders. While the shareholders have a preemptive right to maintain their proportionate ownership, they may not have funds to invest in additional shares. Dilution of ownership assumes great significance in the case of closely-held companies. The issuance of ordinary shares can change the ownership.

c) Issue of Preference shares

These are similar to ordinary shares only that the holders have got a preferential claim on the income and assets of the company. Preference shares are classified into cumulative and non-cumulative shares. Cumulative preference shares are shares on which the dividend can be paid in arrears in case of no sufficient fund available. While as non-cumulative preference shares the dividends can be paid in arrears. Whether there are no profits they must be paid.

Advantages of Preference share capital

- A long-term source of finance; its advantage is that shareholders cannot force the company into liquidations.

- Secondly, dividend payment can be postponed for the cumulative preference shareholders.
- Thirdly, the cost of capital for preference share is expected to be lower than individual shares as they carry less risk.

Disadvantages of Preference shares

- The preference shareholders do not participate in the management of the company and in most cases they do not share in the surplus earnings.
- The dividend can be accumulated and paid in periods of high profits. This means that the dividends will never be written off.
- During liquidation of the company they have preferential claim against the company assets

d) Long term bank loans

Long term bank loans as a source of finance is the mostly used by medium and large enterprise to finance capital projects. Usually the firm negotiates with the bank to obtain loan but on presentation of security in form of a valuable asset.

Advantages of long-term loans

- It may be easy to negotiate with the bank managers.
- The interest rate may not be so high as compared to those of debentures and bonds.
- The lenders are mere creditors and therefore they do not participate in the management of the company operations. This means that obtaining long-term loan does not affect the control of the firm as compared to ordinary shareholders.

Disadvantages of long-term loans

- The process of acquiring the long-term loans is much detailed and tedious.
- The cost of borrowing in terms of interest, commitment fees, compensating balances and the encumbrance on securities pledged can also be high.
- Interest payment obligation must be met in all circumstances otherwise, they loan lenders can force the company into liquidation.

e) Issue of bonds and debentures

Long term debt (loan stock), usually in the form of debentures or bonds, is frequently used as source of long-term finance as an alternative to equity. Bonds and debentures are certificates of indebtedness, which show when the interest and principal amount will be paid.

Advantages of Debenture/Debt for the view of the company

- Cost is limited to the stipulated interest payment.
- There is no dilution of control when debt is issued.
- Debt is cheap. Because it is less risky than equity for the investor, debenture holders will accept a lower rate of return than the shareholders.
- The debt interest is an allowable expense for tax purposes.
- Debt is more flexible because it can in general terms be borrowed, repaid and re-borrowed in variable amounts at any time.

Disadvantages of bonds/debentures

- Shareholders may be concerned that the geared company cannot pay all its interest and still pay a dividend and will raise the rate of return that they require from the company to compensate for this increase in risk.
- Interest on debt must be paid whatever the earnings of the company, unlike dividends, which can be paid in good years and not in bad years.
- Failure of the firm to meet the fixed financing charge (interest) on debentures and bonds will lead to liquidation of the firm.

f) Business Angels

Business angels are financing organizations that are willing to invest in small businesses in return for an equity stake. They can also offer the businesses the benefits of their own management expertise. A number of Business Angels' networks operate in UK to match the businesses equity finance with potential investors.

The main advantage of business angel is that they have knowledge about business management. However they normally require a stake the business in terms of control.

g) Venture Capital Funds

Venture capital is a general term to describe a range of ordinary and preference shares where the investing institution acquires a share in the business. Venture capital is intended for higher risks such as start up situations and development capital for more mature investments. Replacement

capital brings in an institution in place of one of the original shareholders of a business who wishes to realize their personal equity before the other shareholders. The combination of increasing the prospective marketability of Small Medium Enterprises share and tax relief schemes has lead to the proliferation of Venture Capital Fund, which provides equity capital for small and growing business. The range of possible funds includes; those run by merchants and other bank, pension's funds individuals and local authorities.

h) Grants and Soft Loans

Government, local authorities, local development agencies and the European Union are the major sources of grants and soft loans. Grants are normally made to facilitate the purchase of assets and either the generation of jobs or the training of employees. Soft loans are normally subsidized by a third party so that the terms of interest and security levels are less than the market rate.

i) Franchising

Franchising is a method of expanding business on less capital than would otherwise be needed. For suitable businesses, it is an alternative to raising extra capital for growth. Franchisors include Budget Rent-a-Car, Wimpy, Nando's Chicken and Chicken Inn. Under a franchising arrangement, a franchisee pays a franchisor for the right to operate a local business, under the franchisor's trade name. The franchisor must bear certain costs (possibly for architect's work, establishment costs, legal costs, marketing costs and the cost of other support services) and will charge the franchisee an initial franchise fee to cover set-up costs, relying on the subsequent regular payments by the franchisee for an operating profit. These regular payments will usually be a percentage of the franchisee's turnover.

The advantages of franchises to the franchisor are as follows:

- The capital outlay needed to expand the business is reduced substantially.
- The image of the business is improved because the franchisees will be motivated to achieve good results and will have the authority to take whatever action they think fit to improve the results.
- The advantage of a franchise to a franchisee is that he obtains ownership of a business for an agreed number of years (including stock and premises, although premises might be leased from the franchisor) together with the backing of a large organization's marketing effort and experience.

- The franchisee is able to avoid some of the mistakes of many small businesses, because the franchisor has already learned from its own past mistakes and developed a scheme that works.

FACTORS AFFECTING THE CHOICE OF FINANCE

1. **The purpose of the finance:** A golden rule is that sources must be matched with uses e.g. a long-term business expansion plan is not financed by a bank overdraft.
2. **The cost of the finance:** In return for providing equity capital, the owner expects a return in the form of a share of profits (dividends in the case of shareholders). In return for providing loan capital, a financial institution will charge interest on the amount borrowed (a flat rate of interest) or on the amount outstanding (a true rate of interest).
3. **The control of the business:** Issuing new voting shares in a company could lead to a change of power in the board of directors if the existing shareholders are unable to buy part of the issue. Using retained earnings does not affect control but may upset the owners if their dividends are reduced. The use of loan capital will not affect voting control but the financial institution may take control of fixed assets or impose conditions (e.g. restricting dividend payments) as part of the loan agreement.
4. **The tax benefits:** The payment of dividends is not deductible against the corporation's tax on profits whereas the interest on a loan is deductible.
5. **The exposure to risk:** Equity exposes the company to less risk as the share capital only has to be repaid when the company closes. If no profits are available, dividends do not have to be repaid. A loan on the other hand will have a repayment schedule for both the capital and the interest, which must be met if the company is to avoid receivership or liquidation

TOPIC FOUR

CAPITAL STRUCTURE DIVIDEND DECISION AND COST OF CAPITAL

LEARNING OUTCOMES

At the end of this chapter a student will be able to:

- Understand whether dividend should be paid or not
- Rationale for dividend payment
- Composition of capital
- Theories of capital structure
- Cost of capital
- Capital Asset pricing Model

DIVIDEND POLICY

Dividend decision is yet another crucial area of financial management. The important aspect of dividend policy is to determine the amount of earnings to be distributed to the shareholders and the amount to be retained in the firm. Retained earnings are the most significant internal sources of financing the growth of the firm.

The Dividend Decision is a decision made by the directors of a company. It relates to the amount and timing of any cash payments made to the company's stockholders. The decision is an important one for the firm as it may influence its capital structure and stock price. In addition, the decision may determine the amount of taxation that stockholders pay

The objective of a dividend policy should be to maximize a shareholder's return so that the value of his investment is maximized. Return has two components: dividends and capital gains as a result of changes (increases) in the share price.

Factors to consider when designing the dividend policy of a firm

- What are the preferences of the shareholders? I.e. dividend income or capital gains?
- What are the financial needs of the company? Are there any positive NPV projects to undertake?
- How much should be paid out as dividends? Constraints on paying dividends? Legal rules - net profit, capital impairment, insolvency rules and bond covenants.
- What should be the form of dividend?
- Past dividends paid out.

- Liquidity and profitability of the company as an indicator of capacity to pay.
- Tax position of shareholders – Capital gains or income tax on dividends.
- What are the competitors within the same industry paying?
- Access to capital markets for alternative sources of finance and use retained earnings to pay dividends.

IS DIVIDEND POLICY IRRELEVANT?

Modigliani and Miller (MM) argue that the dividend policy of a company is irrelevant because the value of a company is not affected by its financial policy.

In theory the level of dividend is irrelevant and in a perfect capital market it is difficult to challenge the dividend irrelevant position. The level of dividend does not matter as the funds retained would be used to finance profitable investments that would guarantee a 'fat' future dividend.

If dividend policy was irrelevant, dividend payments would have been random. However, dividend payments tend to be regular. This is due to the following reasons;

- **Dividend signaling:** One of the assumptions of MM theory is that all individuals have the same information. However, in reality, investors do not have perfect information concerning the future prospects of the company. Many authorities claim, therefore, that the pattern of dividend payments is a key consideration on the part of investors when estimating future performance. This argument implies that dividend policy is relevant. Firms should attempt to adopt a stable (and rising) dividend payout to maintain investors' confidence.
- **Taxation:** In many situations, income in the form of dividends is taxed in a different way from income in the form of capital gains. This distortion in the personal tax system can have an impact on investors' preferences. From the corporate point of view of this further complicates the dividend decision as different groups of shareholders are likely to prefer different payout patterns.
- **Preference for current income:** Many investors require cash dividends to finance (their) current consumption. This implies that many share holders will prefer companies who pay regular cash dividends and will therefore value the shares of such a company more highly.
- **Agency theory:** Dividend payments can be used to monitor managers. Companies that pay dividends without going back to the capital market are considered to be performing well. Requirement for more capital goes calls for more scrutiny.

STABILITY OF DIVIDENDS

Three distinct forms of dividends stability may be distinguished:

Constant dividend per share or dividend rate:

Those investors who have dividends as the only source of their income prefer the constant dividend policy. They are hardly concerned about the changes in their share prices. In the long run, such behavior helps to stabilize the market price of the share.

Constant pay out:

The ratio of dividend to earnings is known as a payout ratio - a fixed percentage of earnings as dividends every year. This policy is related to the company's ability to pay dividends. If the company incurs losses, no dividends will be paid regardless of the desires of the shareholders. Internal financing with retained earnings is automatic. This policy simplifies the dividend decision, and has the advantage of protecting the company against over and under payment of dividend.

Small constant dividend per share plus extra dividend:

A minimum dividend per share is paid regularly with a step up feature provided. The small amount is fixed to reduce the possibility of ever missing a dividend payment certain shareholder like this policy because of the certain cash flow in form of regular dividend and the option of earning extra dividend occasionally.

Significance of stability of dividends:

- Resolution of investors' uncertainty
- Investors desire for current income
- Institutional investors' requirements

Danger of stability of dividends:

The greatest danger in adopting a stable dividend policy is that once it is established, it cannot be changed without seriously affecting investors' attitude and the financial stand of the company.

CONSTRAINTS ON PAYING DIVIDENDS

The factors which restrict the firm's ability to declare and pay dividends are:

- **Legal restrictions in the dividend policy** - have to be evolved within the legal framework and restrictions.
- **Liquidity** – the payment of a dividend means a cash outflow.
- **Financial condition** - a highly geared firm is expected to retain more to strengthen its equity base.
- **Access to capital markets** - a company, if not sufficiently liquid, can pay dividends if it is able to raise debt or equity in the capital markets.
- **Restrictions on loan agreements** - lenders may generally put restrictions on dividend payments to protect their interests when the firm is experiencing liquidity or profitability difficulties.
- **Control** - the objective of maintaining control over the company by existing management or shareholders may influence the company dividend policy.
- **Investment opportunities** - a growing firm gives precedence to the retention of earnings over the payment of dividends in order to finance its expanding activities.
- **Inflation** – can act as a constraint on paying dividends.

FORMS OF DIVIDENDS

1. Bonus shares/Scrip dividends

An issue of bonus shares represents a distribution of shares in addition to the cash dividend to the existing shareholders. This has the effect of increasing the number of outstanding shares of the company.

Advantages of bonus shares:

To shareholders:

- Tax benefit
- Indication of higher future profits
- Psychological value

To the company:

- Conservation of cash
- Only means to pay dividend under financial difficulty and contractual restrictions
- More attractive share price

Limitations of bonus shares:

- Bonus shares do not give any extra or special benefit to a shareholder. Its proportionate ownership in the company does not change, either.
- Bonus shares are more costly to administer than a cash dividend

Conditions for the issue of bonus shares:

- Residual reserves availability
- Profitability justification

2. Cash dividend: Dividends are declared and paid in cash.

SHARE REPURCHASE

Companies may consider using cash to buy back shares as an alternative to a dividend, particularly if surplus cash available would distort normal dividend policy.

The alternative is to pay one-off surplus as a 'special dividend'.

SHARE SPLIT

A share split is a method to increase the number of shares through a proportional reduction in the par value of the share. A share split affects only the par value and the number of outstanding shares, the shareholders' total fund remains unchanged.

Reasons for share split:

- To make shares more attractive
- Indication of higher future profits
- Increased dividend (in the future)

REVERSE SPLIT

This is reduction of the number of outstanding shares by increasing the par value of share. It is seldom used to stop the market price per share below a certain level. It is generally an indication of financial difficulty, and is intended to increase the market price per share.

THEORY ABOUT DIVIDEND PAYMENT

Modigliani and Miller's hypothesis:

According to Modigliani and Miller (M-M), dividend policy of a firm is irrelevant as it does not affect the wealth of the shareholders. They argue that the value of the firm depends on the firm's earnings which result from its investment policy.

Thus, when investment decision of the firm is given, dividend decision the split of earnings between dividends and retained earnings is of no significance in determining the value of the firm. M – M's hypothesis of irrelevance is based on the following assumptions.

1. The firm operates in perfect capital market
2. Taxes do not exist
3. The firm has a fixed investment policy
4. Risk of uncertainty does not exist. That is, investors are able to forecast future prices and dividends with certainty and one discount rate is appropriate for all securities and all time periods. Thus, $r = K = K_t$ for all t .

Under M – M assumptions, r will be equal to the discount rate and identical for all shares. As a result, the price of each share must adjust so that the rate of return, which is composed of the rate of dividends and capital gains, on every share will be equal to the discount rate and be identical for all shares.

Thus, the rate of return for a share held for one year may be calculated as follows:

$$r = \frac{D + (P_1 - P_0)}{P_0} = \frac{\text{Dividends} + \text{Capital gains (on loss)}}{\text{Purchase price}}$$

Where P^0 is the market or purchase price per share at time 0, P_1 is the market price per share at time 1 and D is dividend per share at time 1. As hypothesised by M – M, r should be equal for all shares. If it is not so, the low-return yielding shares will be sold by investors who will purchase the high-return yielding shares.

This process will tend to reduce the price of the low-return shares and to increase the prices of the high-return shares. This switching will continue until the differentials in rates of return are eliminated. This discount rate will also be equal for all firms under the M-M assumption since there are no risk differences.

From the above M-M fundamental principle we can derive their valuation model as follows:

$$P_0 = \frac{D_1 + P_1}{(1+r)} \quad P_0 = \frac{D_1 + P_1}{(1+k)} \quad r = k$$

Multiplying both sides of equation by the number of shares outstanding (n), we obtain the value of the firm if no new financing exists.

$$V = nP_0 = \frac{N(D_1 + P_1)}{(1+k)}$$

If the firm sells m number of new shares at time 1 at a price of P^1 , the value of the firm at time 0 will be

$$nP_0 = \frac{ND_1 + (n+m)p_1 - mp_1}{(1+k)}$$

The above equation of M – M valuation allows for the issuance of new shares, unlike Walter's and Gordon's models. Consequently, a firm can pay dividends and raise funds to undertake the optimum investment policy. Thus, dividend and investment policies are not confounded in M – M model, like waiter's and Gordon's models.

Criticism:

Because of the unrealistic nature of the assumption, M-M's hypothesis lacks practical relevance in the real world situation. Thus, it is being criticised on the following grounds.

1. The assumption that taxes do not exist is far from reality.
2. M-M argue that the internal and external financing are equivalent. This cannot be true if the costs of floating new issues exist.

3. According to M-M's hypothesis the wealth of a shareholder will be same whether the firm pays dividends or not. But, because of the transactions costs and inconvenience associated with the sale of shares to realise capital gains, shareholders prefer dividends to capital gains.

4. Even under the condition of certainty it is not correct to assume that the discount rate (k) should be same whether firm uses the external or internal financing.

If investors have desire to diversify their port folios, the discount rate for external and internal financing will be different.

5. M-M argues that, even if the assumption of perfect certainty is dropped and uncertainty is considered, dividend policy continues to be irrelevant. But according to number of writers, dividends are relevant under conditions of uncertainty.

It's important to note that

There are four main factors that may influence a firm's dividend decision:

- Free-cash flow
- Dividend clienteles
- Information signalling
- Stability of earnings

1. The free cash flow theory of dividends

Under this theory, the dividend decision is very simple. The firm simply pays out, as dividends, any cash that is surplus after it invests in all available positive net present value projects.

A key criticism of this theory is that it does not explain the observed dividend policies of real-world companies. Most companies pay relatively consistent dividends from one year to the next and managers tend to prefer to pay a steadily increasing dividend rather than paying a dividend that fluctuates dramatically from one year to the next. These criticisms have led to the development of other models that seek to explain the dividend decision.

2. Dividend clienteles

A particular pattern of dividend payments may suit one type of stock holder more than another; this is sometimes called the clienteles effect. A retiree may prefer to invest in a firm that provides a consistently high dividend yield, whereas a person with a high income from employment may prefer to avoid dividends due to their high marginal tax rate on income. If clienteles exist for

particular patterns of dividend payments, a firm may be able to maximise its stock price and minimise its cost of capital by catering to a particular clientele. This model may help to explain the relatively consistent dividend policies followed by most **listed companies**.'

A key criticism of the idea of dividend clienteles is that investors do not need to rely upon the firm to provide the pattern of cash flows that they desire. An investor who would like to receive some cash from their investment always has the option of selling a portion of their holding. This argument is even more cogent in recent times, with the advent of very low-cost discount stockbrokers. It remains possible that there are taxation-based clienteles for certain types of dividend policies.

3. Information signaling

When investors have incomplete information about the firm (perhaps due to opaque accounting practices) they will look for other information that may provide a clue as to the firm's future prospects. Managers have more information than investors about the firm, and such information may inform their dividend decisions. When managers lack confidence in the firm's ability to generate cash flows in the future they may keep dividends constant, or possibly even reduce the amount of dividends paid out. Conversely, managers that have access to information that indicates very good future prospects for the firm (e.g. a full order book) are more likely to increase dividends. According to Grullon (2002) the information value lies in the fact that a dividend increase signals a decrease in systematic risk (a decrease in discount rate), the correlation between dividend changes and earnings changes has not been proved.

Investors can use this knowledge about managers' behavior to inform their decision to buy or sell the firm's stock, bidding the price up in the case of a positive dividend surprise, or selling it down when dividends do not meet expectations. This, in turn, may influence the dividend decision as managers know that stock holders closely watch dividend announcements looking for good or bad news. As managers tend to avoid sending a negative signal to the market about the future prospects of their firm, this also tends to lead to a dividend policy of a steady, gradually increasing payment.

Conclusion

In a fully informed, efficient market with no taxes and no transaction costs, the free cash flow model of the dividend decision would prevail and firms would simply pay as a dividend any excess cash available. The observed behavior of firm differs markedly from such a pattern. Most firms pay a dividend that is relatively constant over time. This pattern of behavior is likely explained by the existence of clienteles for certain dividend policies and the information effects of announcements of changes to dividends.

The dividend decision is usually taken by considering at least the three questions of: how much excess cash is available? What do our investors prefer? and What will be the effect on our stock price of announcing the amount of the dividend?

The result for most firms tends to be a payment that steadily increases over time, as opposed to varying wildly with year-to-year changes in free cash flow.

CAPITAL STRUCTURE

The term capital structure is used to represent the proportionate relationship between debt and equity.

The management of a company should seek answers to the following questions while making the financing decision:

- How should the investment project be financed?
- Does the way in which the investment projects are financed matter?
- How does financing affect the shareholders' risk, return and value?
- Is there an optimum financing mix in terms of the maximum value to shareholders?
- Can the optimum financing mix be determined in practice for a company?
- What factors in practice should a company consider in designing its financing policy?

The basic concern, therefore, is whether there exists an “ideal” capital structure for a company. In other words is it possible to have the lowest cost of capital?

$$\begin{aligned} \bullet \text{ Gearing} &= \frac{\text{Market value of debt (incl. preference shares)}}{\text{Market value of equity}} = D/E \end{aligned}$$

THEORIES OF CAPITAL STRUCTURE

There are three theories on capital structure:

- The traditional theory/ Conventional theory
- The Modigliani and Miller (MM) without tax and
- The Modigliani and Miller (MM) with tax

The Traditional View/ Conventional theory

The Traditional Theory of Capital Structure says that a firm's value increases to a certain level of debt capital, after which it tends to remain constant and eventually begins to decrease.

When there is only equity, WACC starts at the cost of equity. As the more expensive equity finance is replaced by cheaper debt finance, average cost of capital decreases. However, as gearing increases further, both debt holders and equity shareholders will perceive more risk, and their required returns both increase. Inevitably, WACC increases at some point. This theory predicts that there is an optimum gearing ratio at which WACC is minimised

The Traditional Theory of Capital structure tells us that wealth is not just created through investments in assets that yield positive return on investment; purchasing those assets with an optimal blend of equity and debt is just as important.

The cost of capital for a geared company (K_g) is higher than the cost of capital for an un-geared company (K_u).

The major setback for the traditional view is that

- It does not provide a solution in a situation where there are changes in the capital structure such that WACC changes.
- Secondly, the assumption that the cost of equity remains unaffected by gearing up to some reasonable limit is unrealistic.

THE MODGILIANI AND MILLER (MM) THEORY

Assumptions of the MM theory:

- Homogeneous risk classes-firms can be grouped into homogeneous risk classes. By implication, firms within the same industry constitute the homogeneous class.
- Risk- the risk of the investors is defined in terms of variability of the earnings/cash flows.
- Full pay out - firms distribute all earnings as dividend.
- Shareholders are rational (they choose the best investment opportunity).

- There is no taxation.
- Individuals and companies can borrow/lend at the same rate of interest which is equal to the so-called risk free rate.
- The risks of personal gearing and corporate gearing are equal.
- There are no costs involved if a company suffers financial distress (no bankruptcy).
- There are no transactions costs.
- Information is freely available and is costless.

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, agency 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 equity or debt. It does not matter what the firm's dividend policy is. Therefore, the Modigliani–Miller theorem is also often called the **capital structure irrelevance principle**.

The MM view is that companies which operate in the same type of business and which have similar operating risk must have the same total value irrespective of their capital structures because the value of a company depends on the present value of its operations, not on the way it is financed.

Modigliani and Miller (M&M) with tax

The cost of debt is cheaper than equity because creditors have a claim to income and assets that has preference over equity. As the company uses more debt in its capital structure, the cost of equity increases because of the seniority of debt but When taxes are introduced (specifically, the tax deductibility of interest by the firm), the value of the firm is enhanced by the tax shield provided by this interest deduction. The tax shield:

- Lowers the cost of debt.
- Lowers the WACC as more debt is used.
- Increases the value of the firm by Dt (that is, marginal tax rate times debt)

Given D as the market value of debt, K_d the interest rate upon which interest is paid and t the tax rate:
The present value of tax savings on debt will be got by discounting tax savings at the cost of debt, K_d such that:

$$\text{PV of tax savings} = K_d D t / K_d = D t$$

Therefore $V_e = V_u + D t$

Where: V_e = Market value of a geared company
 V_u = Market value of un-geared company
 $D t$ = Tax savings on debt (tax shield)

It can also be proved that under MM Theory of capital structure:

$$\text{WACC} = K_u \{1 - D t / (E + D)\}$$

This formula will be most useful where the K_d is not easy and reliable to estimate.

Example 13

Canal (U) Ltd is an all equity company with an equilibrium market value of US\$ 32.5 billion and a cost of capital of 18% per year. The company proposes to repurchase US\$ 5 billion of equity and to replace it with 13% irredeemable loan stock. Canal's earnings before interest and tax are expected to be constant for the foreseeable future. Corporate tax is at the rate of 31%. All profits are paid out as dividends.

Required:

Using the assumptions of Modigliani and Miller explain and demonstrate how this change in capital structure will affect:

- (i) the market value;
- (ii) the cost of equity;
- (iii) the cost of capital, of Canal (U) Ltd.

Solution:

(i) Using MM theory:

$$V_e = V_u + D_t$$

$$V_e = 32.5\text{bn} + 5\text{bn} \times 0.31 = \text{US\$ } 34.05\text{bn}$$

$$D = \text{US\$ } 5\text{bn}$$

$$\text{Therefore } E = (34.05 - 5)\text{bn} = \text{US\$ } 29.05\text{bn}$$

The market value of Canal will increase by £ 1.55bn (34.05 - 32.5)

(ii) The weighted average cost of capital (WACC) can be found as follows:

$$\begin{aligned} \text{WACC} &= K_u[1 - D_t/(E + D)] \\ &= 0.18[1 - (5 \times 0.31)/34.05] \\ &= 17.18\% \end{aligned}$$

The WACC has fallen by 0.82% due to the benefit of tax relief on debt interest payments.

(iii) Cost of equity:

$$\text{WACC} = K_e E + K_d(1 - t) D$$

$$(E + D) (E + D)$$

$$17.18 = K_{eg} \times (29.05/34.05) + 13 \times (1 - 0.31) \times (5/34.05)$$

$$K_e = 18.59\%$$

The cost of capital, as expected, has increased by 0.6% as a result of the increased debt burden.

Criticisms of the MM model:

- Market inefficiencies hamper the arbitrage process.
 - Companies can often borrow on better terms than individual investors.
 - Corporate borrowing does not expose the investor to personal liability in the way that personal borrowing does.
 - Some institutional investors are prohibited from indulging in "home-made" gearing.
 - Transaction costs will restrict the arbitrage process
 - In practice, it may be impossible to identify firms with identical business risk and operating risk characteristics.
 - Some earnings may be retained.
 - Investors are assumed to act rationally which may not be the case in practice.
 - The model ignores taxation. This is a serious problem as one of the key advantages of debt is the tax relief on interest payments.
 - Under the theory risk is measured entirely by variability of cash flows ignoring the possibility that cash flows might cease because of bankruptcy and the theory may not be valid at very high levels of gearing.
-
- **THE CAPITAL STRUCTURE DECISION – HOW MUCH DEBT?**
 - From the foregoing capital structure discussions above, there is value in debt:
 - A geared company has higher value than an un-geared company.
 - A geared company has a lower WACC than one that is un-geared.
-
- Management would then be tempted to borrow as much as they can to benefit from the above advantages. As already noted the capital structure decision is a complicated one involving return-risk considerations. All in all, firms would be advised to borrow provided:
 - There is capacity to borrow – the company has adequate collateral for security against debt. Adequate collateral means fixed assets not currently used to secure other debt.
 - There is capacity to service debt – the company is earning sufficient profits to pay for interest on debt - adequate interest cover!
 - There are a number of value-adding (positive NPV) projects for the company to invest in.
 - The acquisition of debt is in line with the company's overall strategy.

- Whereas all the above conditions may have been met, the decision to acquire more debt will depend on the extent to which management views the risk involved in more debt on one hand, and the risk involved in new projects on the other. Therefore the risk averseness of management is also a key factor in taking the financing decision(s).

PECKING ORDER THEORY:

According to the pecking order theory, firms will raise capital according to how expensive (or cheap) they are. Below is the order starting with the cheapest source!

- Internal funds (including marketable securities).
- Debt.
- Equity.

COST OF CAPITAL

The project's cost of capital is the minimum acceptable rate of return on funds committed to the project. The minimum acceptable rate or the required rate of return is a compensation for time and risk in the use of capital by the project. Since projects differ in risk, each one of them will have its own unique cost of capital.

The firm, on the other hand represents the aggregate of investment undertaken by it. Therefore, the firm's cost of capital will be the overall, or average required rate of return on the aggregate of the investment projects.

The concept of cost of capital is significant in financial decision-making. It is useful as a standard for:

- **Evaluating investment decisions.** The cost of capital is the discount rate used for evaluating the desirability of the investment project.
- **Designing a firm's debt policy** i.e. the proportion of debt and equity in the capital structure, the firm aims at minimizing the overall cost of capital.
- **Appraising the financial performance of top management.** This involves comparing actual profitability of the investment projects undertaken by the firm with the overall cost of capital, and the appraisal of the actual costs incurred by management in raising the required funds.

COST OF EQUITY (K_e)

Cost of equity is the cost to the company of providing equity holders with the return they require on their investment. Dividends may be paid at a constant rate or they may grow gradually but at a constant rate.

Where dividends per share remain constant at current levels

$$P_0 = \frac{d_0(1+g)}{(K_e - g)} \quad g \text{ will equal to } 0$$

Example 1

A plc has paid a dividend of 500 per share for many years. This is expected to continue for the foreseeable future. A plc's current share price is UGX2,500 ex div. You are required to calculate the cost of equity of X plc, K_e .

Solution: $P_0 = \frac{d_0(1+g)}{(K_e - g)}$

$$2500 = \frac{500}{K_e}$$

$$K_e = \frac{500}{2500}$$

$$K_e = 20\% \text{ per annum}$$

Note: Current share price used is Ex. Div. (i.e. without the next dividend payment).

Increasing Dividends

Assuming increasing dividend streams of income (Investors' perspective), to deal with an increasing perpetuity we need a formula.

$$P_0 = \frac{d_0(1+g)}{(K_e - g)}$$

Where

- P_0 is the price per share ex-dividend
- d_0 is the dividend per share first paid
- K_e is the cost of equity

Example 2

D plc has just paid a dividend of 300 per share. Shareholders expect dividends to grow at 5% pa. The current share price is 1,800 ex div.

$$P_0 = \frac{d_0(1+g)}{(K_e - g)}$$

$$1,800 = \frac{(300 \times 1.05)}{(K_e - 0.05)}$$

$$(K_e - 0.05) = \frac{300 \times 1.05}{1800}$$

$$K_e = 22.5\%$$

Note: If the market capitalisation is given in cum div terms it will need to be converted to the ex div equivalent for use in the formula.

ESTIMATING THE RATE OF GROWTH IN DIVIDENDS

When estimating the formula for the cost of equity, we need to know the rate of dividend growth that shareholders expect in the future. If this figure is given to us in the examination then there is obviously no problem.

However, you may be expected to estimate the dividend growth rate using one of two approaches;

- Using the rate of growth in the past $D_n = D_0(1+g)^n$
- Using the rb model

Estimating growth from the Gordon model (rb model)

The approach considers the reason for growth in dividends. In order to have long term growth in dividends, the company needs to achieve long term growth in earnings. The only long term, continual source of finance that shareholders will be in position to expect is the retention of earnings. The growth can be estimated using the following formula:

$$g = rb$$

Where; b = the proportion of earnings retained in the company

r = the rate of return that the company can earn on re-investment.

Example 3

Estimate the rate of growth in dividends for the Stanbic Bank Ltd shares if the earnings per share when it declared a dividend of Ushs. 6 per share was Ushs 22. The required rate of return for financial institutions in Uganda is 20%.

Solution

It is important to realize that $\text{eps} = \text{EAT}/\text{No of Shares}$ and $\text{dps} = \text{Dividends}/\text{No of Shares}$.
Therefore:

$$b = \frac{\text{eps} - \text{dps}}{\text{eps}}$$

$$= \frac{22 - 6}{22}$$

$$= 0.727$$

Hence: $g = 20\% \times 0.727 = 14.5\%$

Limitations of this method

- The accounting ratios calculated are assumed to remain constant over time (which is illogical in reality)
- The model uses accounting data (which can be manipulated to suit management objectives)
- The model only works correctly if the company is all equity financed (assumes the company has no debt; this is not practical in most cases)

Divided Growth Model

The historical pattern method to calculating Dividend Growth rate

$$D_n = D_0(1+g)^n$$

Where

- D_n is the current (last) dividend
- d_0 is the dividend per share first paid
- g is the growth in dividend

Example 4

The dividend per share of GPS Ltd has grown from Ushs 10 per share in 2004 when it was first declared to Ushs 25 per share in 2009. Estimate the rate of growth in dividends over the same period.

Solution:

$$\begin{aligned} d_n &= d_0(1+g)^n \\ d_n &= 25; d_0 = 10; n = 2007 - 2002 = 5; g = ? \\ 25 &= 10(1+g)^5 \\ (1+g)^5 &= 25/10 = 2.5 \\ G &= (2.5)^{0.2} - 1 \\ &= 1.201 - 1 \\ &= 0.2 \text{ or } 20\% \end{aligned}$$

PREFERENCE SHARES

Therefore:

$$\begin{aligned} K_d &= D_p/P_o, \text{ implying that the market price is given by:} \\ P_o &= D_p/K_p \end{aligned}$$

Where

- P_o is the present market price of the preference shares ex- div
- D_p is the dividend paid to preference shareholders
- K_p is the cost on the preference shares

Example 5

A company has 1 million 5% preference shares outstanding, each with a nominal value of UShs 50. The preference share price 20.83. Calculate cost of preference shares.

$$\begin{aligned} P_o &= D_p/K_p & D_p &= 5\% \times 50 = \text{UShs } 2.50, & P_o &= \text{UShs } 20.83 \\ P_o &= D_p/K_p \\ 20.83 &= 2.5 / K_p \\ K_p &= 2.5 / 20.83 \\ K_p &= \mathbf{12\%} \end{aligned}$$

COST OF DEBT (K_d)

1. IRREDEEMABLE DEBT

Irredeemable debt is debt that is never repaid. It does not exist in practice, but in the examination you assume debt to be irredeemable unless told otherwise.

Therefore:

$$K_d = i(1-t)/P_o$$

Where

- P_o is the present market price of the security ex-interest
- i is the annual interest
- t tax rate
- K_d is the required return/cost on the security

The security price can be stated in 2 ways; the ex-interest price excludes the interest paid while the cum-interest price includes the interest paid on the security. The price used in the estimation of the cost of irredeemable debt is the ex-interest price.

Tax has the effect of reducing the return, interest (i) by the tax rate, t : $i = i(1-t)$.

Example 6

An issue of 14% irredeemable debentures is currently priced at UShs109,000 ex-interest. Assuming a tax rate of 35%, what is the after tax cost of the debenture, assuming that the value of one Debenture Stock is UShs 100,000

Solution

$$\begin{aligned}K_d &= i(1-t)/P_o \\i &= 14\% \times 100,000 = \text{Ushs } 14,000 \\P &= \text{Ushs } 109,000 \\K_d &= \frac{14,000(1-0.35)}{109,000} \\&= 0.0835 \text{ or } 8.35\%\end{aligned}$$

2 Redeemable debt: This has the following characteristics:

- There is fixed annual interest payments; and
- The principal is repaid, in a lump sum, at the maturity of the debt.

The repayment of the principal (technically referred to as Redemption) may take 3 forms:

- **At par** – the company will pay back (redeem) exactly what was borrowed i.e. US\$ 100,000 for every US\$ 100,000 borrowed per Stock;
- **At a premium** – the company pays back more than what was borrowed. Redemption at a premium of 5% means payment of US\$ 100,000(1+0.05) = US\$ 105,000=, for every US\$ 100,000 borrowed per Stock; and
- **At a discount** - the company pays back less than what was borrowed. Redemption at a discount of 5% means payment of US\$ 100,000(1-0.05) = US\$ 95,000=, for every US\$ 100,000 borrowed per Stock.

The return to the debt holder is twofold; fixed annual interest payments until the maturity/expiry of the debt and the lump sum repayment of the principal. Therefore the cost of finance, (or debt holders' required rate of return) is that value of discount rate, K_d that equates the present value of future interest payments, i , and the redemption price, R , to the current market price, P_o .

Estimating the Cost of Redeemable Debt

From the formula:

$$PV = \frac{i}{(1+k_d)^1} + \frac{i}{(1+k_d)^2} + \dots + \frac{i}{(1+k_d)^n} + \frac{M}{(1+k_d)^n}$$

It is very difficult to derive a direct formula for K_d . Therefore to estimate the cost of redeemable debt, we calculate the IRR. This means that the right K_d will be given when NPV = 0.

Use the formula below:

$$K_d = LR + \frac{NPV_{LR}}{NPV_{LR} - NPV_{HR}} (HR - LR)$$

- Where
- LR is the lower rate
 - HR is the higher rate
 - NPV_{LR} is the NPV at the lower rate
 - NPV_{HR} is the NPV at the higher rate

Example 7

Consider an issue of 8% debenture redeemable in 7 years' time at par and currently priced at US\$ 86,000. What is the cost of the debenture using the par value of one Stock as US\$ 100,000 and corporation tax is 30%

Coupon rate = 8%

$i = 8\% \times 100,000 (1-0.3) = \text{US\$ } 5,600$

$R = \text{US\$ } 100,000$ (at par)

$P_0 = \text{US\$ } 86,000$

$n = 7$ years

$a_n = 5.889$

$PVF_n = 0.583$

NPV at 8% Years	Cashflows	Discount factor @ 8%	PV
0	86,000	1.000	86,000
1	(5,600)	0.926	
2	(5,600)	0.857	
3	(5,600)	0.794	
4	(5,600)	0.735	
5	(5,600)	0.681	
6	(5,600)	0.630	
7	(105,600)	0.583	
NPV			

THE WEIGHTED AVERAGE COST OF CAPITAL (WACC)

There are various sources of long-term capital i.e. equity, debentures (they could vary with different terms and conditions), preference shares and term loans. The dilemma is to determine the minimum required rate of return on investments that are variously financed with differing costs of the various sources of capital.

The WACC is the effective (after tax) cost of the different sources of long term finance used by a company. It is an underlying assumption that long-term finance will be used to finance long-term capital investment projects hence matching the company's long-term assets and liabilities.

To estimate the WACC:

- Estimate the cost of each source of capital individually;
- Estimate the proportion of each source of capital to total capital on the basis of their market values (the weight); and
- Add the costs of all the sources of capital attaching an appropriate weight to each source.

Given that:

- E is the market value of equity
- D is the market value of debt
- K_e is the cost of equity of a geared company
- K_d is the cost of debt

$$\text{WACC} = \frac{K_e E}{(E+D)} + \frac{K_d D}{(E+D)}$$

Example 8

The capital structure and cost of individual sources of capital for a company are as follows:

	Market value (UGX'000)	Cost(%)
Ordinary shares	1,000	21%
Preference shares	300	14%
Debentures	500	8%

Calculate the cost of capital for the company.

Solution:

$K_e = 21\%$; $K_p = 14\%$; $K_d = 8\%$

Total capital = 1,000 + 300 + 500 = UShs 1,800 million.

Therefore:

$$\begin{aligned} \text{WACC} &= 21\% \frac{(1,000)}{1,800} + 14\% \frac{(300)}{1,800} + 8\% \frac{(500)}{1,800} \\ &= 0.162 \text{ or } 16.2\% \end{aligned}$$

WITH TAXATION:

Tax affects the interest paid on debt since interest expense is tax allowable.

Therefore:

$$\text{WACC} = \frac{K_e E}{(E+D)} + K_d(1-t) \frac{D}{(E+D)}$$

- E is the market value of equity
- D is the market value of debt
- K_e is the cost of equity of a geared company
- K_d is the pretax cost of debt
- t is the rate of corporation tax

Advantages of WACC:

- New investments must be financed by new sources of funds: retained earnings, new share issues, new loans, etc, therefore they should be appraised using a WACC.
- The cost of capital to be applied to project evaluation must reflect the marginal cost of new capital; the minimum return on the new capital.
- The WACC reflects the company's long-term future capital structure and capital costs.

Arguments against WACC:

- New investments undertaken by a company might have different business risk characteristics from the company's existing operations.
- The finance that is raised to fund a new investment might substantially change the capital structure and the perceived financial risk of investing in the company.
- Many companies raise floating rate debt capital as well as fixed interest debt capital.

CAPM AND GEARING RISK

To evaluate a project with a different risk, a company will select a suitable beta. Because beta values are not easy to obtain, they are calculated with reference to existing companies operating in those business areas. Firms with above average returns are assumed to have correspondingly higher than average systematic risk and their beta is accordingly higher than the market risk.

The systematic risk arises from 2 sources

- The risk resulting from the firm's business activities and
- The finance risk caused by the level of gearing.

If a firm is not geared (only depends on equity financing), it will have only the business risk which is likely to be lower than the systematic risk of a geared firm of comparable size. If a company is not geared, its beta is β_{Asset} reflecting only the business risk.

If a company is geared, its beta is β_{equity} reflecting the systematic risk of the business and financial risk.

Hence when given various asset betas, the following procedure is followed;

- identify the appropriate beta
- Adjust it to reflect the firm's own gearing levels i.e. – gear the beta to convert it into an equity beta.

If the beta selected is from a geared company, the following is relevant.

- identify the appropriate equity beta
- Adjust it to convert to an asset beta-degear it.

- Re-adjust the asset beta to reflect its own gearing level-gear the beta.

To gear or degear the beta, the following formula is used

$$\beta_{\text{Asset}} = \beta_{\text{Equity}} \times \frac{E}{E + D(1-t)}$$

where

E = Market value of equity

D = Market value of debt

t = corporation tax rate

Prime Ltd on the construction industry has an equity debt ratio of 5:2. The debt which is assumed to be risk free has a gross redemption yield of 11%. The beta value of the company's equity is 1.1. The average return on the stock market is 16%. The corporation tax rate is 30%.

The company is considering a project whose equity beta is 1.59 and an equity debt ratio of 2:1. Prime is to maintain its capital structure after the implementation of the new project. What is the appropriate cost of capital for this new project.

The equity beta for the new project is $\beta_{\text{Equity}} = 1.59$ with gearing ratio of **2.1**

- De-gear the β equity of the project to find only the business risk.

$$\begin{aligned} \beta_{\text{asset}} &= \beta_{\text{Equity}} \times \frac{E}{E + D(1-t)} \\ &= 1.59 \times \frac{2}{2 + (1-0.30)} \\ &= 1.18 \end{aligned}$$

β_{Equity} of the new project at Prime Ltd's gearing ration

$$\begin{aligned} \beta_{\text{asset}} &= \beta_{\text{Equity}} \times \frac{E}{E + D(1-t)} \\ 1.18 &= \beta_{\text{Equity}} \times \frac{5}{5 + (1-0.3)} \\ \beta_{\text{Equity}} &= 1.18/0.78 = 1.51 \end{aligned}$$

Cost of equity of the project

$$\begin{aligned}
K_e &= R_f + \beta (R_m - R_f) \\
&= 11\% + 1.51 (16\% - 11\%) = 18.55\%
\end{aligned}$$

$$\begin{aligned}
K_d &= 1(1-t) \\
&= 11\% (1-0.3) = 7.70
\end{aligned}$$

WACC of the project

$$\begin{aligned}
&= 18.55\% \times 5/7 + 7.70 \times 2/7 \\
&= 15.45\%
\end{aligned}$$

Honey bee an all equity food chain store is about to embark on a major diversification into the consumer electronics industry. Its current β equity is 1.2 while the average equity beta of consumer electronics is 1.6. Gearing in the electronics industry averages 30% debt 70% equity. Corporate debt is considered to be risk free. $R_m = 2.5\%$, $R_f = 10\%$ corporation tax rate = 30.

What would be the suitable discount value for the new investment if honey bee were to finance the new project in each of the following ways?

- a) entirely by equity
- b) by 30% debt & 70% equity
- c) 40% debt and 60% equity

Estimating cost of equity - using CAPM

If an investor's RRR reflects the risk they face, then their RRR will not be fixed overtime for all investments. Instead it will vary with time and the type of project. In order to reduce on the risk of one share, an investor may acquire a second share with a different risk profile. If this is repeated, an investor may diversity risk by holding a portfolio of shareholders in different industries.

As an investor acquires more and more shares in different companies, the initial diversification will bring about substantial risk reduction up to a certain point.

The risk reduction slows and eventually stops altogether once 15-20 carefully selected. Investments have been combined due to the type of risk faced.

According to the capital assets pricing Model, there are two types of risks, Systematic and non-systematic risk.

Systematic risk is that one which affects all companies in the same way but in varying degrees e.g. inflation, economic boom, interest rates, while nonsystematic risk is that one which impact each firm differently, depending on their circumstances, e.g. inefficiency of management.

In diversification, one can virtually eliminate the unsystematic risk but the systematic risk remains.

A rational investor would wish to reduce the risk faced to a minimum and would therefore try to diversify his investments. If he is successful in doing this, he will only need compensation for the systematic risk faced.

The capital assets pricing model (CAPM) assumes that all investors will hold a well-diversified portfolio of shares known as the market portfolio.

It assumes

- well diversified investors
- perfect capital market
- unrestricted borrowing or lending at the Risk free return rate of interest
- uniformity of investor expectations

The RRR of a rational, risk averse, well informed investor can therefore be found by

Required return = risk free return + risk premium

i.e RRR = $R_f + \beta (R_m - R_f)$

Where R_f = Risk free rate

R_m = average market return

$(R_m - R_f)$ = Average market risk premium or equity risk premium

Beta = Systematic risk of the investment Compared to market and therefore amount of this premium needed.

If Beta >1, the investment is riskier than an average investment

If Beta <1, the investment is less risky than the average investment

If Beta =1, the investment is risk free

This Beta is the measure of the systematic risk of a security relative to that of the market portfolio. The CAPM shows the linear relationship between the risk premium of the security and the risk premium of the market portfolio.

Risk premium of share – market risk premium

i.e

$$R_y = R_f + (R_m - R_f) \beta$$

$$\text{or } E(r) = R_f + B (E(R_m) - R_f)$$

Illustration

The current average market return on risky investment is 12%. Compared with 5% on treasury bills. G Company has a beta of 1.2. What is the cost of equity of equity of G Company?

$$\begin{aligned} \text{Required return} &= R_f + \beta (R_m - R_f) \\ &= 5\% + 1.2 (12\% - 5\%) \\ &= 13.4\% \end{aligned}$$

TOPIC FIVE

CAPITAL MARKET THEORY

LEARNING OUTCOMES:

At the end of this topic a student will be able to:

- Define a capital market
- Discuss the cycle operations of capital markets
- Explain the Uganda securities exchange
- Discuss the financial markets hypothesis
- Explain Empirical testing of efficient market hypothesis

PREAMBLE

The market where investment instruments like bonds, equities and mortgages are traded is known as the capital market. The primal role of this market is to make investment from investors who have surplus funds to the ones who are running a deficit.

Examples of Capital Markets

- New York Stock Exchange (NYSE)
- American Stock Exchange (AMEX)
- Chicago Board of Trade
- Chicago Board Options Exchange (CBOE)

The capital market offers both long term and overnight funds. The different types of financial instruments that are traded in the capital markets are:

- Equity instruments
- Credit market instruments,
- Insurance instruments,
- Foreign exchange instruments,
- Hybrid instruments and
- Derivative instruments.

NATURE OF CAPITAL MARKETS

The nature of capital market is brought out by the following facts:

- It has two segments
- It deals in long-term securities
- It performs trade-off function
- It creates dispersion in business ownership
- It helps in capital formation
- It helps in creating liquidity

ADVANTAGES OF CAPITAL MARKETS

- Help firms and government raise cash by selling securities
- Allow investors with excess funds to invest and earn a return
- Channel funds from savers to borrowers
- Allocate resources optimally (i.e. provide funds to those who can make the best use of them)
- Help allocate cash to where it is most productive
- Help lower the cost of exchange
- Secondary markets, where investors trade existing securities assure investors that they can quickly sell their securities if the need arises.

TYPES OF CAPITAL MARKETS

There are two types of capital market:

- Primary market,
- Secondary market

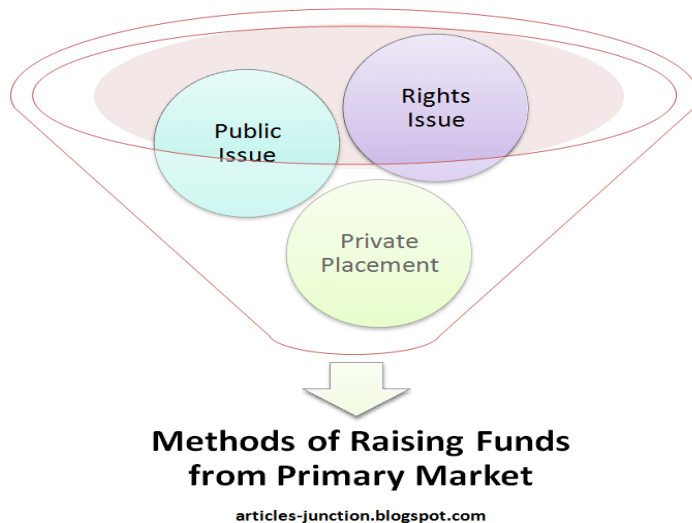
PRIMARY MARKET

It is that market in which shares, debentures and other securities are sold for the first time for collecting long-term capital. This market is concerned with new issues. Therefore, the primary market is also called **NEW ISSUE MARKET**.

In this market, the flow of funds is from savers to borrowers (industries), hence, it helps directly in the capital formation of the country. The money collected from this market is generally used by the companies to modernize the plant, machinery and buildings, for extending business, and for setting up new business unit.

METHODS OF RASISING CAPITAL IN THE PRIMARY MARKET

Methods of raising capital from primary market are given in the image below.



Methods of raising capital through primary market are:

1. Public issue,
2. Rights issue,
3. Private placement.

Different methods of raising capital in primary market are:

Public Issue: Here prospectus is issued, and a public appeal is made to subscribe the new shares / debentures issued by the company. Shares are allocated in response to application received. Some companies sell shares directly to the public while some take help of share brokers. The company appoints an advertising agency to advertise about the issue of shares.

Rights Issue: Rights issue means new shares are offered to the existing shareholders on the pro-rata basis. When company wants to raise additional capital, securities are first offered to the existing shareholders. If the shareholders do not want to buy shares, then the company can sell the shares to the outside public.

Private Placement: Private Placement of shares means the company sells its shares to a small group of investors. It can sell to banks, insurance companies, financial institutions, etc. It is an economical and quick method of selling securities. The company does not sell its shares to the public.

FEATURES OF PRIMARY MARKET

- This is the market for new long term equity capital.
- It becomes before secondary market
- The primary market is the market where the securities are sold for the first time.
- In a primary issue, the securities are issued by the company directly to investors.
- The company receives the money and issues new security certificates to the investors.
- Primary issues are used by companies for the purpose of setting up new business or for expanding or modernizing the existing business.
- The new issue market does not include certain other sources of new long term external finance
- Borrowers in the new issue market may be raising capital for converting private capital into public capital; this is known as "going public."

NEED FOR PRIMARY MARKET

- To raise funds for certain purpose.
- To create market for new issues of securities.
- To establish the magnitude of the market.
- To mobilize resource the economy.

- For overall development of companies.

SECONDARY MARKET

The secondary market, also called aftermarket, is the financial market in which previously issued financial instruments such as stock, bonds, options, and futures are bought and sold. Another frequent usage of "secondary market" is to refer to loans which are sold by a mortgage bank to investors.

The term "secondary market" is also used to refer to the market for any used goods or assets, or an alternative use for an existing product or asset where the customer base is the second market (for example, corn has been traditionally used primarily for food production and feedstock, but a "second" or "third" market has developed for use in ethanol production).

Products deal in Secondary Markets.

- Equity shares
- Government securities
- Debentures
- Bonds

FEATURES OF SECONDARY MARKET

It Creates Liquidity: The most important feature of the secondary market is to create liquidity in securities. Liquidity means immediate conversion of securities into cash. This job is performed by the secondary market.

It Comes after Primary Market: Any new security cannot be sold for the first time in the secondary market. New securities are first sold in the primary market and thereafter comes the turn of the secondary market.

It has a Particular Place: The secondary market has a particular place which is called Stock Exchange. However, it must be noted that it is not essential that all the buying and selling of securities will be done only through stock exchange.

Two individuals can buy or sell them mutually. This will also be called a transaction of the secondary market. Generally, most of the transactions are made through the medium of stock exchange.

It Encourages New Investment: The rates of shares and other securities often fluctuate in the share market. Many new investors enter this market to exploit this situation. This leads to an increase in investment in the industrial sector of the country.

FUNCTIONS OF SECONDARY MARKET

- Provides regular information about the value of security
- Helps to observe prices of bonds and their interest rates
- Offers to investors liquidity for their assets
- Secondary markets together many interested parties
- It keep the cost of transactions low

FAMOUS SECONDARY MARKETS WORLD WIDE

- New York Stock exchange
- NASDAQ
- The London Stock Exchange
- The Tokyo Stock Exchange
- Shanghai Stock Exchange

OPERATIONS OF CAPITAL MARKETS

Capital markets are markets used by companies to raise long term funds needed to finance long term investments. It is a market in which corporate equity and long term securities (those

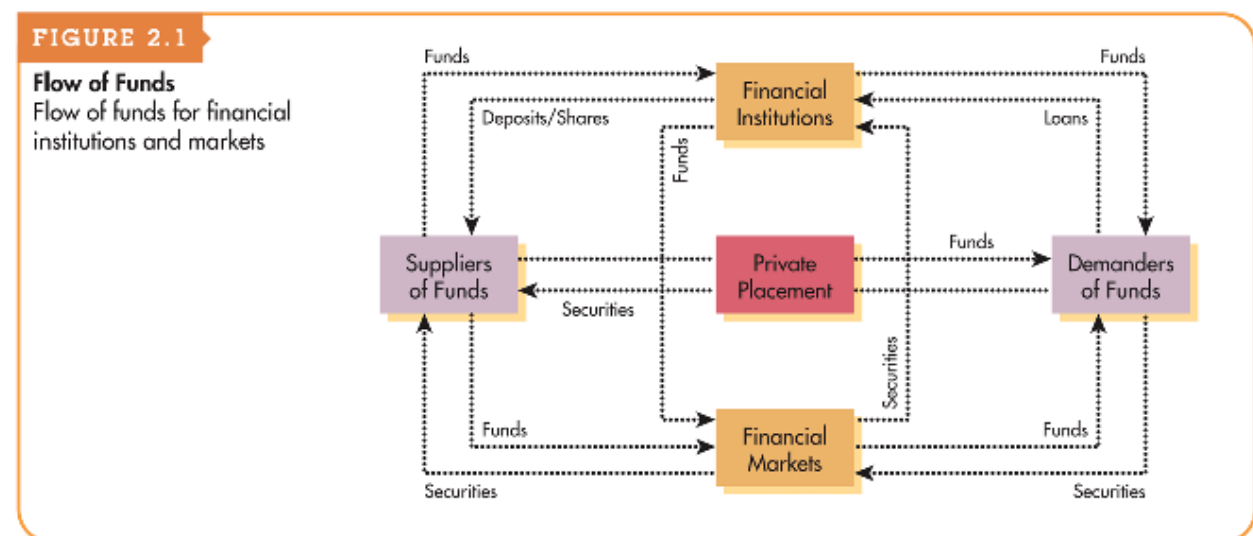
maturing in more than one year) are issues and traded. The money raised is also to conduct research and developments. Much of the funds in capital markets come from major institutions such as pension funds, insurance companies and universities, banks etc.

In US as well as other developed countries, capital markets play several roles such as sources of income to investors and providing instant feedback to corporate executives about how investors judge performance of different corporate companies. Stock/Share values in capital markets reflect investor reactions to government policy. If government adopts policies that investors believe will hurt the economy and the company profits capital markets declines and if policies will help the economy capital market rises.

To work effectively capital markets require free flow of information and numerous sources of capital market information include:

- Quarterly and annual financial reports
- Market pages of daily news papers
- Business magazines and newsletter devoted to analyzing particular stocks and capital markets.

ILLUSTRATION



UGANDA SECURITY EXCHANGE

The Uganda Securities Exchange (USE) is the principal stock exchange of Uganda. It was founded in June 1997. The USE is operated under the jurisdiction of Uganda's Capital Markets Authority, which in turn reports to the Bank of Uganda, Uganda's central bank.

The exchange's doors opened to trading in January 1998. At the time, the exchange had just one listing, a bond issued by the East African Development Bank. Trading was limited to only a handful of trades per week.

As of June 2011, the USE trades fourteen (14) listed local and East African companies and has started the trading of fixed income instruments. The exchange, which is open five days a week, is a member of the African Stock Exchanges Association.

The USE operates in close association with the Dar es Salaam Stock Exchange in Tanzania and the Nairobi Stock Exchange in Kenya and plans are underway to integrate the three to form a single East African bourse

MARKET LISTING

As of August 2013

Number	Symbol	Company
1	BOBU	Bank of Baroda
2	BATU	British American Tobacco
3	DFCU	DFCU Group
4	EABL	East African Breweries
5	JHL	Jubilee Holdings
6	KA	Kenya Airways
7	KCB	KCB Group
8	NVL	New Vision Group
9	SBU	Stanbic Bank Group
10	UCL	Uganda Clays Limited
11	EBL	Equity Bank Group

12	NIC	National Insurance Corporation
13	HFB	Housing Finance Bank
14	UCHU	Uchumi Supermarkets
15	NMG	National Media Group
16	CENT	Centum Investment Company Limited
17	UMEME	Umeme
18	CRANE	Crane Bank

FUNCTIONS OF UGANDA SECURITY EXCHANGE

The basic function of USE is to provide a facility for raising funds for investment in long-term assets. While this is extremely important as the engine through which the stock exchange is driven, there are other important functions of the USE:

The mobilization of savings

The mobilization of savings for investment in productive enterprises as an alternative to putting savings in bank deposits, purchase of real estate, and outright consumption. It is an addition to the Banking System as it provides more diversity to the already available financial instruments.

Improvement of access to finance for new and smaller companies

This is futuristic in most developing countries because venture capital is mostly unavailable. The listing requirements of USE have been specially designed to meet the needs of this sector.

Creation of Liquidity

The creation of liquidity, this is the ability of securities to be converted into cash at a market price. Acquiring and selling of shares is fairly simple, inexpensive and swift and can be done at any time to suit the investor's convenience.

The growth of the related financial services sector

Institutions like the insurance, pension and provident fund schemes nurture the spirit of savings. USE provides an avenue through which financial securities can be traded by such institutions in order to facilitate their activities as financial intermediaries.

Encouragement of higher standards of accounting, resource management and public disclosure

Institutions like the insurance, pension and provident fund schemes nurture the spirit of savings. USE provides an avenue through which financial securities can be traded by such institutions in order to facilitate their activities as financial intermediaries.

Facilitation of equity financing as opposed to debt financing

Equity financing has a component of flexibility. The company pays holders depending on its performance; whereas debt financing requires that the holder of the security be entitled to a fixed sum in interest disregarding the performance of the company.

Divestiture of Government Owned Companies

The USE assists in the divestiture of government owned companies. The privatization process through capital markets includes the flotation of shares and needs a secondary market for its success. Through this process indigenous people are able to attain a stake in the privatized companies.

Price Discovery

Providing a mechanism for price discovery through open market operations at the Exchange. The price at which a deal is made indicates not only the value of the shares in question but also the value the market is willing to pay for the shares in question.

EFFICIENT MARKETS HYPOTHESIS

The concept of an efficient Market

An efficient market is one in which security prices fully reflect all the available information in the market. In an efficient market new information is rapidly and rationally incorporated into share prices in an unbiased way.

Benefits of efficient markets

An efficient market is needed to:

Ensure investor confidence: Investors need to know they will pay and receive a fair price when they buy and sell shares. If shares are incorrectly priced, many savers would refuse to invest this seriously reducing the availability of funds. Investor confidence in the pricing efficiency is essential.

Motivation and control: The primary objective of directors is to maximize shareholders wealth i.e. maximizing the share price. In implementing a positive **(NPV)** decision directors can be assured that the decision once communicated to the market will result in an increased share price will fall. Like all feedback systems the stock market has dual function. It motivates directors to maximize share price while providing early warning system of potential problems.

Assumptions of Efficient Market Hypothesis

- There are perfect capital markets
- Information about the companies is available to all at no cost
- There is no inside trading
- No investor is large enough to influence market prices
- Investors behave rationally
- There are no transaction costs in the market.

TYPES OF MARKET EFFICIENCY

WEAK FORM

It assumes that current stock prices reflect all security market information including historical information. In this form, the efficient market, all past price movements are already incorporated into the share price. The form contends that past information cannot be used to predict the future. The form implies that there is no relationship between past/historical information (historical price changes and future changes). Therefore any trading rule that enables an investor to predict the future security prices in the past data are useless and no value.

SEMI STRONG FORM

This hypothesis centres on how rapidly and efficiently market prices of shares can be adjusted to new publicly available information. Share prices react not only on released information but also to the expectation to changes in the company's fortunes. Investors will be able to see beyond creative accounting or window dressing by companies in an attempt to overstate profits, e.g. contents of future financial reports such as changes in earnings per share, payment of dividends etc.

Evidence from European stock markets has indicated that; share prices react within 5 -10 minutes of any new information released and share prices will;

- Rise in response to breaking news
- Fall in response to breaking bad news

The theory of semi strong market efficiency concludes that:

- Fundamental analysts who examine publicly available information will not provide opportunities to consistently beat the market.
- Only those trading in the first few minutes after the news breaks can beat the market
- Since published information includes past share prices, a semi strong form efficient market is also weakly efficient.

STRONG FORM EFFICIENCY

In this form of the market, the share price incorporates all the information whether public or private, including information that is not yet published. This type of the market efficiency includes the assumptions made in both the weak and semi strong market efficiency. The form requires the market not only to be efficient but perfect where all the information is available to everyone at the same time.

CONCLUSIONS

- Inside dealers are normally fined and imprisoned for making money by trading in shares before the news affecting them are made public.
- The stock exchange normally encourages quick release of new information to prevent insider trading opportunities.
- Insiders are forbidden from trading in their shares at crucial times.

LIMITATIONS OF EFFICIENT MARKET HYPOTHESIS

- It assumes that all capital markets are developed as in developed countries like UK, US etc, which is not true.
- It ignores the impact of information in influencing the market outcome ie markets tend to over react to both good and bad news.
- The hypothesis ignores the main objective of the business which is profit maximization i.e. every one will always strive to earn higher profit than the rest.
- The capital markets ignore shares of small companies or small volumes of the share. This limits the growth of capital markets by ignoring potential entrants to the market.
- It assumes that all days of trading are good and the same which is not true because there are times when it's more advantageous to buy or sell shares and there are other days when it's better to avoid trading altogether.
- It is not important to acquire and analyze public information.

TOPIC SIX

CORPORATE RESTRUCTURING AND COMPANY VALUATION

LEARNING OUTCOMES:

At the end of this topic a student will be able to:

- Explain company analysis and valuation
- Analyze and value of stocks
- Analyze and value of fixed income securities
- Distinguish between mergers and acquisitions

PREAMBLE

Corporate restructuring is the process of redesigning one or more aspects of a company. The process of reorganizing a company may be implemented due to a number of different factors, such as:

- Positioning the company to be more competitive,
- Survive a currently adverse economic climate, or
- Poise the corporation to move in an entirely new direction.

Restructuring a corporate entity is often a necessity when the company has grown to the point that the original structure can no longer efficiently manage the output and general interests of the company. For example, a corporate restructuring may call for spinning off some departments into subsidiaries as a means of creating a more effective management model as well as taking advantage of tax breaks that would allow the corporation to divert more revenue to the production process. In this scenario, the restructuring is seen as a positive sign of growth of the company and is often welcome by those who wish to see the corporation gain a larger market share.

Corporate restructuring *may take place as a result of the acquisition of the company by new owners*. The acquisition may be in the form of a leveraged buyout, a hostile takeover, or a merger of some type that keeps the company intact as a subsidiary of the controlling corporation.

When the restructuring is due to a hostile takeover, corporate raiders often implement a dismantling of the company, selling off properties and other assets in order to make a profit from the buyout. What remains after this restructuring may be a smaller entity that can continue to function, albeit not at the level possible before the takeover took place.

In general, *the idea of corporate restructuring is to allow the company to continue functioning in some manner.* Even when corporate raiders break up the company and leave behind a shell of the original structure, there is still usually the hope that what remains can function well enough for a new buyer to purchase the diminished corporation and return it to profitability.

However, financial restructuring may take place in response to a drop in sales, due to a sluggish economy or temporary concerns about the economy in general. When this happens, the corporation may need to reorder finances as a means of keeping the company operational through this rough time. Costs may be cut by combining divisions or departments, reassigning responsibilities and eliminating personnel, or scaling back production at various facilities owned by the company. With this type of corporate restructuring, the focus is on survival in a difficult market rather than on expanding the company to meet growing consumer demand.

Financial restructuring is the reorganization of the financial assets and liabilities of a corporation in order to create the most beneficial financial environment for the company. The process of financial restructuring is often associated with corporate restructuring, in that restructuring the general function and composition of the company is likely to impact the financial health of the corporation. When completed, this reordering of corporate assets and liabilities can help the company to remain competitive, even in a depressed economy.

The process of financial restructuring may be undertaken as a means of eliminating waste from the operations of the company. For example, the restructuring effort may find that two divisions or departments of the company perform related functions and in some cases duplicate efforts. Rather than continue to use financial resources to fund the operation of both departments, their efforts are combined. This helps to reduce costs without impairing the ability of the company to still achieve the same ends in a timely manner.

In some cases, financial restructuring is a strategy that must take place in order for the company to continue operations. This is especially true when sales decline and the corporation no longer

generates a consistent net profit. A financial restructuring may include a review of the costs associated with each sector of the business and identify ways to cut costs and increase the net profit. The restructuring may also call for the reduction or suspension of production facilities that are obsolete or currently produce goods that are not selling well and are scheduled to be phased out.

Financial risk is the amount of chance that is present with any type of financial investment. Typically, the goal is to secure investments that appear to have a low amount of risk since these are more likely to earn a return. Both individual and corporate investors assess the degree of risk present before executing an order to buy shares on any investment market.

MAJOR CATEGORIES OF RESTRUCTURING

A. EXPANSIONS:

Expansions include mergers, consolidations, acquisitions and various other activities which result in an enlargement of a firm or its scope of operations. There is a lot of ambiguity in the usage of the terms associated with corporate expansions.

- A **Merger** involves a combination of two firms such that only one firm survives. Mergers tend to occur when one firm is significantly larger than the other and the survivor is usually the larger of the two. A Merger can take the form of
 - **Horizontal merger** involves two firms in similar businesses. The combination of two oil companies or two solid waste disposal companies, for example would represent horizontal mergers.
 - **Vertical mergers** involves two firms involve in different stages of production of the same end product or related end product.
 - **Conglomerate mergers** involve two firms in unrelated business activities.
- A **consolidation** involves the creation of an altogether new firm owning the assets of both of the first two firms and neither of the first two survive. This form of combination is most common when the two firms are of approximately equal size.

The **joint ventures**, in which two separate firms pool some of their resources, is another such form that does not ordinarily lead to the dissolution of either firm. Such ventures typically involve only a small portion of the cooperating firms overall businesses and usually have limited lives.

The term **acquisitions** means an attempts by one firm, called the acquiring firm to gain a majority interest in another firm called the target firm. The effort to gain control may be a prelude to a subsequent merger to establish a parent subsidiary relationship, to break up the target firm and dispose of its assets or to take the target firm private by a small group of investors. There are a number of strategies that can be employed in corporate acquisitions like friendly takeovers, hostile takeovers etc.

B) CONTRACTIONS:

Contraction, as the term implies, results in a smaller firm rather than a larger one. If we ignore the abandonment of assets, occasionally a logical course of action, corporate contraction occurs as the result of disposition of assets. The disposition of assets, sometimes called sell-offs, can take either of three broad form:

(i) **A sell-off**, also known as a divestiture, is the outright sale of a company subsidiary. Normally, sell-offs are done because the subsidiary doesn't fit into the parent company's core strategy. The market may be undervaluing the combined businesses due to a lack of synergy between the parent and subsidiary. As a result, management and the board decide that the subsidiary is better off under different ownership. Besides getting rid of an unwanted subsidiary, sell-offs also raise cash, which can be used to pay off debt.

(ii) **Spin-offs** A spinoff occurs when a subsidiary becomes an independent entity. The parent firm distributes shares of the subsidiary to its shareholders through a stock dividend. Since this transaction is a dividend distribution, no cash is generated. Thus, spinoffs are unlikely to be used when a firm needs to finance growth or deals. Like the carve-out, the subsidiary becomes a separate legal entity with a distinct management and board.

(iii) **Divestitures** **divestment** or **divestiture** is the reduction of some kind of asset for either

financial or ethical objectives or sale of an existing business by a firm. A divestment is the opposite of an investment. First, a firm may divest (sell) businesses that are not part of its core operations so that it can focus on what it does best. A second motive for divestitures is to obtain funds. Divestitures generate funds for the firm because it is selling one of its businesses in exchange for cash. A third motive for divesting is that a firm's "break-up" value is sometimes believed to be greater than the value of the firm as a whole. In other words, the sum of a firm's individual asset liquidation values exceeds the market value of the firm's combined assets. This encourages firms to sell off what would be worth more when liquidated than when retained.

(iv) **Carve outs.** More and more companies are using equity carve-outs to boost shareholder value. A parent firm makes a subsidiary public through an initial public offering (IPO) of shares, amounting to a partial sell-off. A new publicly-listed company is created, but the parent keeps a controlling stake in the newly traded subsidiary. A carve-out is a strategic avenue a parent firm may take when one of its subsidiaries is growing faster and carrying higher valuations than other businesses owned by the parent. A carve-out generates cash because shares in the subsidiary are sold to the public, but the issue also unlocks the value of the subsidiary unit and enhances the parent's shareholder value.

The new legal entity of a carve-out has a separate board, but in most carve-outs, the parent retains some control. In these cases, some portion of the parent firm's board of directors may be shared. Since the parent has a controlling stake, meaning both firms have common shareholders, the connection between the two will likely be strong.

Spin-offs and carve outs create new legal entities while divestitures do not.

(3) OWNERSHIP AND CONTROL

The third major area encompassed by the term corporate restructuring is that of ownership and control. It has been wrested from the current board; the new management will often embark on a full or partial liquidating strategy involving the sale of assets. The leveraged buyout preserves the integrity of the firm as legal entity but consolidates ownership in the hands of a small group.

In the 1980s, many large publicly traded firms went private and employees a similar strategy called a leveraged buyout or LBO.

Whether a purchase is considered **a merger or an acquisition** really depends on whether the purchase is friendly or hostile and how it is announced. In other words, the real difference lies in how the purchase is communicated to and received by the target company's board of directors, employees and shareholders.

Synergy

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.

Other takeovers are *strategic* in that they are thought to have secondary effects beyond the simple effect of the profitability of the target company being added to the acquiring company's

profitability. For example, an acquiring company may decide to purchase a company that is profitable and has good distribution capabilities in new areas which the acquiring company can utilize for its own products as well.

A target company might be attractive because it allows the acquiring company to enter a new market without having to take on the risk, time and expense of starting a new division.

An acquiring company could decide to take over a competitor not only because the competitor is profitable, but in order to eliminate competition in its field and make it easier, in the long term, to raise prices.

Also a takeover could fulfill the belief that the combined company can be more profitable than the two companies would be separately due to a reduction of redundant functions.

How to resist a hostile takeover bid.(Please read)

- i)** revaluing the company to a very high value to scare off predator
 - ii)** arranging an MBO or Buy in
 - iii)** inviting another company to make a counter offer
 - iv)** convincing shareholders to refuse the offer
 - v)** paying high dividends to shareholders so they don't see reason for selling their share holding
- **A reverse takeover** can occur in different forms:
 - a smaller corporate entity takes over a larger one.
 - a private company purchases a public one.
 - a method of listing a private company while bypassing most securities regulations, in which a shell public company buys out a functioning private company whose management then controls the public company.

There are a variety of reasons that an acquiring company may wish to purchase another company. Some takeovers are *opportunistic* - the target company may simply be very reasonably priced for one reason or another and the acquiring company may decide that in the long run, it will end up making money by purchasing the target company.

Merging

In business or economics a **merger** is a combination of two companies into one larger company. Such actions are commonly voluntary and involve stock swap or cash payment to the target. A merger can resemble a takeover but result in a new company name (often combining the names of the original companies) and in new branding; in some cases, terming the combination a "merger" rather than an acquisition is done purely for political or marketing reasons.

- Horizontal mergers take place where the two merging companies produce similar product in the same industry.
- Vertical mergers occur when two firms, each working at different stages in the production of the same good, combine.
- Conglomerate mergers take place when the two firms operate in different industries.

Motives behind Mergers

- ***Economies of scale:*** *This refers to the fact that the combined company can often reduce duplicate departments or operations, lowering the costs of the company relative to theoretically the same revenue stream, thus increasing profit.*
- Increased revenue/Increased Market Share: This motive assumes that the company will be absorbing a major competitor and increasing its power (by capturing increased market share) to set prices.
- Cross Selling: For example, a bank buying a stock broker could then sell its banking products to the stock broker's customers, while the broker can sign up the bank's **customers** for brokerage accounts. Or, a manufacturer can acquire and sell complementary products.
- Synergy: Better use of complementary resources.
- Taxes: A profitable company can buy a loss maker to use the target's **tax write-offs**.

MERGERS AND ACQUISITIONS: VALUATION MATTERS

Investors in a company that is aiming to take over another one must determine whether the purchase will be beneficial to them. In order to do so, they must ask themselves how much the company being acquired is really worth.

Naturally, both sides of an M&A deal will have different ideas about the worth of a target company: its seller will tend to value the company at as high of a price as possible, while the buyer will try to get the lowest price that he can.

Reasons for Share Valuations

- a) For Quoted companies** when there is a takeover bid and the offer price is an estimated 'Fair Value' in excess of the current market price of the shares. Otherwise the share price is determined by market conditions on the stock exchange. A takeover is an acquisition by the company of a controlling interest in the voting shares of another company, usually achieved by the purchase of the majority of the voting shares.
- b) For Un-quoted companies, When**
 - (i)** The company wishes to get floated on stock exchange and must fix an issue price for its shares.
 - (ii)** There is a proposal scheme for a merger
 - (iii)** Shares are to be sold
 - (iv)** Shares need to be valued for purposes of taxation.
 - (v)** Shares are pledged as collateral for a loan.
- c) For Subsidiary companies**, when the holding company is negotiating the sale of the subsidiary to a management Buyout team or to an external buyer.

There are, however, many legitimate ways to value companies. The most common method is to look at comparable companies in an industry, but deal makers employ a variety of other methods and tools when assessing a target company. Usually, valuing unquoted companies presents some special considerations. For example,

- It may not be sensible to use a P/E ratio of a quoted company for comparative purposes because the market value of a quoted company is likely to include a premium to reflect marketability of its shares.
- It may not be sensible to use the Cost of Equity of a quoted company to compare because the Cost of capital for a quoted company is likely to be much lower to reflect the fact that it is viewed as less risky by investors.

COMMON BASES FOR VALUING SHARES

- Asset Based
- Earnings Based – P/E Ratios, Earnings Yield, ARR
- Cash flow Based- Dividends DCF
- Dividends Growth model

1) Asset Valuation Bases

Using this method of valuation, the value of a share in a particular class is equal to the ***net tangible assets attributable to that class, divided by the number of shares in that class.*** Intangible assets should be excluded, unless they have a market value (for example patents and copyrights which could be sold.)

- Goodwill if shown in accounts, is unlikely to be shown at a true figure for purposes of valuation and so the value of goodwill should not be reflected in net assets method.
- Development expenditure if shown in accounts would have a value which is related to future profits rather than the worth of the company's physical assets.

Example of net asset method

The Summary balance sheet of Katwe Car Manufacturers is shown below

	Shs '000,000'	Shs '000,000'	Shs '000,000'
Fixed Assets			
Land and Buildings			160,000
Plant			80,000
Vehicles			<u>20,000</u>
			260,000
Goodwill			20,000
Current Assets			
Stocks	80,000		
Debtors	60,000		
Short Investments	15,000		
Cash	<u>5,000</u>		
	160,000		
Current Liabilities			
Creditors	60,000		
Taxation	20,000		
Proposed	<u>20,000</u>	(100,000)	
			<u>60,000</u>
			<u>340,000</u>
12% debentures			60,000
Deferred Tax			10,000
Ordinary shares of 1000 @			80,000
Reserves			140,000
14% Preferred shares of 1000@			<u>50,000</u>
			<u>340,000</u>

What is the value of an ordinary share using the net assets method of valuation?

The difficulty with asset based measures is establishing the asset values to use. Values ought to be realistic. Possibilities include;

- Historic basis – unlikely to give a realistic measure of the real value of the asset
- Replacement Basis – if the asset is to be used on an ongoing basis
- Realisable Value – If the Asset is to be sold or the business as a whole broken up.

Some times the assets may need Professional valuation, which can be an additional cost.

The Net Asset method may be used in the following circumstances

- a) AS a measure of the security in a share value. A share could be measured using an earnings basis and this valuation could be:
 - Higher than the net asset value per share, i.e if the company went into liquidation, the investor could not expect to receive the the full value of his shares from sale of underlying assets.
 - Lower than the net asset value per share i.e if the company is sold, the investor could expect to receive the full value of his shares and perhaps much more, when underlying assets are sold.
- b) As a measure of comparison in a merger scheme. A merger is basically a business combination between two or more companies, of which none obtains control over any other.
- c) As a 'Floor value' or reserve value for a business that is up for sale. Shareholders will be reluctant to sell at a value less than Net asset value.

2. EARNINGS VALUATION BASES

A. The P/E Ratio method

This is a common method of valuing a controlling interest in a company, where the owner can decide on a dividend and retention policy.

Since P/E ratio = $\frac{\text{Market Value (p)}}{\text{EPS}}$

EPS

Then the Market price per share = EPS x P/E ratio

NB Please recall that $EPS = \frac{\text{Profit/Loss attributable to ordinary share holders}}{\text{Weighted Average number of ordinary shares in the year}}$

Weighted Average number of ordinary shares in the year

The P/E ratio produces an earnings based valuation of shares. The higher the P/E ratio, the higher will be the price. A high P/E ratio indicates;

- a) **Expectations that EPS will grow rapidly.** In other words, a high price is being paid now for future profit prospects. Many small but successful companies are valued on stock market at higher P/E ratio on the strength of expected future earnings.
- b) **Security of Earnings,** - a well established low-risk company would be valued on a higher P/E Ratio than a similar company whose earnings are subject to high uncertainty.
- c) **Status;** If a quoted company (the predator) made a share for share take over bid, for an unquoted company(the target), it would normally expect its own shares to be valued on a higher P/E ratio than the target company's shares. This is because a quoted company ought to be a lower risk company; and in addition there is an advantage in holding shares which are quoted on the stock exchange, as these can be readily sold on the secondary market.

The P/E ratio of an unquoted company's share could be about 50%-60% of the P/E ratio of a similar Quoted company. This ought to be considered in exam calculations. Please remember to adjust the P/E downwards if valuing an unquoted company using the P/E of a quoted company

Example

Waks plc is considering the takeover of an unquoted company, Seya Ltd. Waks shares are quoted on the stock exchange at 320shs per share and since the most recent published EPS of the company is 20 shs, the P/E ratio for Waks is 16. Seya ltd has 100,000 shares and current earnings of 50,000,000 shs. How much should Waks plc pay for seya ltd?

When a company is thinking of taking over an unquoted company, the final price will be agreed by negotiation after taking into consideration factors such as economic and financial conditions, asset backing and liquidity, the size and status of industry.

For exam purposes, a figure around 2/3 to 1/2 of the industry average P/E should be taken when valuing an unquoted company.

Forecast growth in earnings

When a company is thinking of taking over another, it should look at the target company's forecast earnings, not just its historical results.

Forecasts of earnings should only be used if;

- a) There are good reasons to believe that earnings growth will be achieved.
- b) A reasonable estimate of growth can be made
- c) Forecasts supplied by the target company's directors are made in good faith.

B. ARR method

This method considers the ARR which will be required from the company whose shares are to be valued. It is different from the P/E ratio which is concerned with the market rate of return required. The following formula should be used;

$$\text{Value} = \frac{\text{Estimated future Profits}}{\text{Required return on capital employed}}$$

For a takeover bid valuation, it is often necessary to adjust the profits figure to allow for expected changes after the takeover. For example some changes in exam questions will be;

- New levels of director's remuneration
- New levels of interest charges (for example if predator will be able to replace existing loans at lower interest rates or because the previous owners had lent the company money at noncommercial rates.
- Effects of product rationalization and improved management.

Example

Chambers ltd is considering acquiring hall ltd. At present, Hall ltd is earning on average 480,000,000 shs after tax. The directors of chambers feel that after re-organization, this figure could be increased to 600,000,000 shs. All companies in chambers group are expected to yield a post-tax ARR of 15% on capital employed. What should Hall ltd be valued at?

Solution

$$\text{Valuation of Hall} = \frac{600,000,000}{15\%} = 4,000,000,000/=$$

This is the maximum that chamber would be prepared to pay. The first offer could be probably much lower than this.

An ARRR Valuation could be used in a takeover when the Acquiring Company is trying to assess the maximum amount it can afford to pay.

Valuing Bonds

Bonds, particularly those which are traded in secondary markets, are priced according to supply and demand. The main influences on the price of a bond will be the general level of interest rates for securities of that risk level and maturity. If the coupon is less than the current interest rate the bond will trade at less than the par value (say, of \$100).

Example

1

Take the case of an irredeemable bond with an annual coupon of 8%. This financial asset offers to any potential purchaser a regular \$8 per year forever. When the bond was first issued general interest rates for this risk class may well have been 8% and so the bond may have been sold at \$100. However interest rates change over time. Suppose that the rate demanded by investors is now 10%.

Investors will no longer be willing to pay \$100 for an instrument which yields \$8 per year. The current market value of the bond will fall to \$80 ($\$8/0.10$) because this is the maximum amount needed to pay for similar bonds given the current interest rate of 10%. If the coupon is more than the current market interest rate the market price of the bond will be greater than the nominal (par) value. Thus, if market rates are 6% the irredeemable bond will be priced at \$133.33 ($\$8/0.06$).

The formula relating the price of an irredeemable bond, the coupon and the market rate of interest is:

$$P_D = \frac{i}{k_D}$$

where:

P_D = price of bond

i = nominal annual interest (the coupon rate x nominal value of the bond)

k_D = market discount rate, annual return required on similar bonds (redemption yield)

Also:

$$V_D = \frac{I}{k_D}$$

where:

V_D = total market value of bonds

I = total annual nominal interest

We may wish to establish the market rate of interest represented by the market price of the bond.

Example 2

If an irredeemable bond offers an annual coupon of 9.5% and is currently trading at \$87.50, with the next coupon due in one year, the rate of return is:

$$k_D = \frac{i}{P_D} = \frac{9.5}{87.5} = 0.1086 \text{ or } 10.86\%$$

Variable rate bonds are coupon-paying bonds where the coupon interest rate (and dollar coupon) is tied to a common market rate such as the current interest rate on Treasury bonds.

Relative to fixed coupon rate bonds, variable rate bonds protect the lender from rising interest rates.

A *puttable bond* gives the owner the right to sell the bond back to the issuer before maturity at a pre-specified price.

Typically investors will exercise their put option when interest rates have risen.

A *junk bond* (a high yield bond) is a bond that is rated below investment grade.

Junk bonds reflect the return/risk tradeoff in that a higher return is required by the investor to compensate for increased default risk.

An *international bond* is one sold in a country different from the issuing company. An international bond can be denominated in the domestic currency of the issuing country (a Eurobond) or the local currency of the foreign country.

3. CASH FLOW VALUATION METHODS

The Dividend yield method of share valuation

The Dividend yield method is suitable for the valuation of small share holdings in unquoted companies. It is based on the principle that small shareholders are mainly interested in dividends, since they cannot control decisions affecting the company's profits and earnings. A suitable offer price would therefore be one which compensates them for future dividends they will be giving up if they sell their shares.

$$\text{Dividend yield} = \frac{\text{Dividend per share}}{\text{Market Value per share}} \times 100\%$$

$$\text{Market value} = \frac{\text{Dividend}}{\text{Dividend yield}}$$

This method and earnings yield method have same problems. The determination of a suitable earnings/dividend yield and the appropriate level of sustainable dividends/earnings to use remains a major setback.

The Dividend Valuation Model

The dividend valuation model assumes that the value of a share will be the discounted present value of all expected future dividends on the share, discounted at the shareholder's cost of Capital.

- When a company is expected to pay a constant dividend every year into the future, in perpetuity, the following formula applies

$$P_0 = d/k_e \quad \text{where } P_0 \text{ is market price, and } d \text{ is dividend.}$$

When a company is expected to pay a dividend which increases at an average constant rate g , every year, the following dividend growth model will be used.

$$P_0 = \frac{D_1}{K_e - g} = \frac{D_0(1+g)}{K_e - g} \text{ or } \frac{D_1}{r - g}$$

From paper 14 it can be recalled that D_0 is the dividend in current year and D_1 or $D_0(1+g)$ is the expected next dividend.

Example

Target Ltd paid a dividend of 25,000,000 this year. The current return to shareholders of companies in the same industry as Target plc is 12%, although it is expected that an additional risk premium of 2% will be applicable to Target, being a smaller and unquoted company. Compute the value of Target Ltd

- i) If the current level of dividend is to continue in perpetuity
- ii) If the dividend is expected to grow at a rate of 4% pa.

Solution.

$$K_e = 12\% + 2\% = 14\% \text{ or } 0.14 \quad D_0 = 25,000,000 \quad g \text{ in ii) } = 4\%$$

$$\text{i) } P_0 = D_0 / K_e = \frac{25,000,000}{0.14} = 178,571,400/=$$

$$\text{ii) } \frac{D_0(1+g)}{K_e - g} = \frac{25,000,000(1+0.04)}{0.14 - 0.04} = 260,000,000/=$$

What are limitations of dividends valuation model?

Discounted cash flow method of share valuation

This method is most appropriate when one company intends to buy the assets of another company and to make further investments in order to improve cash flows in future. (Recall all NPV fundamentals from paper 9 and 14. Positive NPV, negative NPV, Acceptance criteria and Discounting).

Example

Diversification ltd wishes to make a bid for Tadpole ltd. Tadpole makes an after tax profit of 40,000,000 a year. Diversification believes that if further money is spent on additional investments, the after tax cash flows (ignoring purchase consideration) would be as follows

Year	Cash flow '000 (net of tax)
0	(100,000)
1	(80,000)
2	60,000
3	100,000
4	150,000
5	150,000

The After tax cost of capital of Diversification ltd is 15% and the company expects all its investments to pay back, in discounted terms, within five years. What is the maximum price that company should be willing to pay for Tadpole?

Soln.

The maximum price is one which would make the return from the total investment exactly 15% over the five years so that the NPV at 15% would be zero.

Year	Cash flow '000(net of tax)	PV factor (15%)	PV '000
0	(100,000)	1.000	(100,000)
1	(80,000)	0.870	(69,600)
2	60,000	0.756	45,360
3	100,000	0.658	65,800
4	150,000	0.572	85,800
5	150,000	0.497	<u>74,550</u>
<u>Maximum purchase price</u>			<u>101,910</u>

REFERENCES

- ACCA Reading Text (Paper F9) on Financial Management 2007-2008

- Brealey, R and Myers, S (2003): Principles of corporate Finance. 7th edition McGraw Hill/Irwin
- Pike, R and Neale, B (1999): Corporate finance and investments: Decisions and strategies. 3rd edition prentice hall.
- Van Horne, J (2001): Financial Management and Policy .12th edition Prentice Hall
- Tony Davies, Tony Boczko and Jean Chen (2008) *Strategic Corporate Finance*. International Edition. UK, McGraw Hill Publishing.
- Richard A. Brealy and Stewart C. Myers (2008) *Principles of Corporate Finance*. International Edition. Athens, Greece, McGraw Hill Publishing.
- Stephen A. Ross and Randolph W. Westerfield (2008) *Essentials of Corporate Finance*. International Edition. Athens, Greece, McGraw Hill Publishing.