

# CPA

**Certified Public Accountant Examination**

**Stage: Intermediate Level I1.1**

**Subject Title: Managerial Finance**

**Study Manual**



INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS OF RWANDA  
*Driving Sustainable Performance*

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**INSTITUTE OF  
CERTIFIED PUBLIC ACCOUNTANTS  
OF  
RWANDA**

**Intermediate Level**

**I1.1 MANAGERIAL FINANCE**

First Edition 2012

**This study manual has been fully revised and updated  
in accordance with the current syllabus.**

**It has been developed in consultation with experienced lecturers.**

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# **INTRODUCTION TO THE COURSE**

## **Stage: Intermediate Level 1**

### **Subject Title: I1.1 Managerial Finance**

#### **AIM**

The aim of this subject is to ensure that students understand the nature and scope of financial management. They should be able to assess an entity's funding requirements, calculate the cost of the available sources of finance, and advise on the optimum financing structure for an entity. Students should be able to evaluate the role of, and apply, corporate planning and budgetary control techniques. They are also expected to demonstrate excellent written communication skills and the ability to integrate learning from the syllabi of this and other subjects.

#### **MANAGERIAL FINANCE AS AN INTEGRAL PART OF THE SYLLABUS**

Managerial Finance develops the knowledge of students with respect to the financial management of organisations and builds on the Formation 2 Stage Management Accounting subject. This subject is an essential underpinning for Strategic Corporate Finance, Strategic Performance Management and Strategy, Leadership & Knowledge Management at Advanced 2 Stage.

#### **LEARNING OUTCOMES**

On successful completion of this subject students should be able to:

- Interpret, and critically appraise corporate objectives (including shareholder value, stakeholder value, value creation, investment policy and long and short-term financing);
- Analyse and evaluate the main financial management decisions of a company (including capital budgeting, investment appraisal, working capital management, capital structure and dividend decisions).
- Describe and discuss the relationship between risk and return and demonstrate its application to portfolio theory and the Capital Asset Pricing Model (CAPM).
- Apply, evaluate and compare common business valuation models.
- Evaluate the role of corporate planning and budgetary control as key elements in managerial finance including the preparation and utilisation of performance measurement statements.
- Prepare and present quantitative and qualitative information for management decision-making integrating analysis, argument, and commentary in a form appropriate to the intended audience.

## **Syllabus:**

### **1. Financial Environment**

- Aims and objectives of profit seeking and non-profit seeking organisations.
- The inter-relationship between financial management, management accounting and financial accounting.
- Interests and influence of key stakeholder groups.
- Ethics and corporate governance issues in Managerial Finance.

### **2. Sources Of Finance**

- Equity / debt financing and associated risks.
- Short, medium and long term finance.
- The nature and importance of internally generated funds.
- Determinants of capital structure.
- The nature and role of capital markets, - types of share capital including: rights issues, convertibles, warrants, etc.
- Sources of government finance including: grants, national aid schemes, tax incentives etc.
- Venture capital financing, nature, benefits and risks.

### **3. Investment Appraisal**

- Time Value of Money, present values of cash flows, use of Present Value and Annuity Tables.
- Identification of relevant cash flows.
- Non-financial factors relevant to investment decisions.
- Investment appraisal techniques including:
  - Net Present Value
  - Adjusted Present Value
  - Internal Rate of Return
  - Payback.
- Lease or buy decisions.
- The effects of inflation, taxation and capital rationing on the investment decision.

### **4. Working Capital Management**

- Effective working capital management strategies and corporate survival.
- Cash budgets/cash-flow forecasts.
- The operating cycle.
- Debtor and creditor management techniques including: credit evaluation, terms of credit, settlement discounts, debt collection techniques, factoring and invoice discounting.
- Inventory management techniques, including EOQ and JIT.
- Overtrading - symptoms, causes and remedies.

## **5. Cost of Capital**

- Cost of equity, Dividend growth and Capital Asset Pricing (CAPM) methods.
- Cost of redeemable and irredeemable debt.
- WACC – Calculation, application and interpretation.
- Systematic and unsystematic risk.
- Portfolio diversification.
- Portfolio theory and its application in practical financial management.
- Dividend decisions.
- Calculate and interpret the risk and return of a two asset portfolio.

## **6. Business Valuations**

- Methods of valuing a business, including:
  - Asset bases.
  - Earnings bases.
  - Discounted cash flow.
  - Dividend yield.
  - Dividend growth.

## **7. Budgetary Planning and Control**

- Budgetary planning and control.
- Incremental, zero-based and activity based approaches to budget formulation.
- Functional budgets, including cash flow (linked to syllabus area 4), projected statements of comprehensive income and statements of financial position.
- Behavioural aspects of budgeting.
- The government budgeting process

## **8. Management Accounting in Decision Support**

- Variance calculation and analysis including fixed overhead capacity and efficiency variances.
- Target costing.
- Relevant costs in decision making.
- Pricing decisions:
  - Price / demand relationships.
  - Cost plus pricing.
  - Market driven pricing.
- Limiting factors (including linear programming - with two decision variables. Using either the graphical and simultaneous equation approaches).
- Make or buy decisions.
- Qualitative factors relevant to specific decisions:
  - Internal
    - H.R. / Motivational.
    - External
      - Competitor Activity.
      - Social and environmental considerations.
      - Impact on stakeholder groups including: customers, employees, investors, suppliers and society.
- Simulation

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# **Study Unit 1**

## **Objectives of Financial Management**

### **Contents**

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#### **A. Introduction**

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#### **B. Agency Theory**

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#### **C. Public Sector/Not-For-Profit Organisations**

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#### **D. Corporate Social Responsibility (CSR)**

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#### **E. Impact of Government on Activities**

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#### **F. Composition of Shareholders**

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## A. INTRODUCTION

It is often assumed that the single objective of commercial entities is:

To Maximise the **Value** of the Firm

Or

To Maximise the **Wealth** of the Shareholders

In reality, firms have multiple, and often conflicting, objectives and will seek to optimise among those. The modern corporation is a complex entity which is responsible not only to shareholders but to all *stakeholders*.

The main stakeholders are:

1. **Shareholders**
2. **Loan Creditors** – seek security, repayment of loan interest and principal.
3. **Employees** – seek fair wages, promotional opportunities, welfare & social facilities => improved motivation.
4. **Management** - job security, fair reward, job satisfaction.
5. **Trade Creditors** - payment within credit terms.
6. **The Community** – sponsorship, charities, install environmental measures.
7. **The Government** - payment of taxes, rates, provide employment.
8. **Customers** - provision of service/goods at fair price, quality, on time etc.

The relative importance of the various groups may differ, possibly depending on company size and management style.

Management will be concerned with the value of the firm as it satisfies one of the important stakeholders (shareholders). A low valuation may increase the possibility of an unwanted takeover bid. Also, finance must be adequately rewarded and its market value maintained, so that further finance is obtainable when required.

**Non-financial** objectives may conflict with financial objectives – e.g. provision of staff recreational facilities; modern, safe working environment etc.

## B. AGENCY THEORY

The managers/directors act as **agents** for the shareholders (owners) in running the company. This separation of ownership from control may lead to certain problems if managers are not monitored or constrained - e.g. management working inefficiently; adopting risk adverse policies such as 'safe' short-term investments and low gearing; empire building for power/status; rewarding themselves with high salaries and fringe benefits; increased leisure time etc.

Managers' and shareholders' interests can be aligned by a number of measures - introducing profit-related remuneration for management, offering bonus shares, share option schemes,

scrutiny of performance by the board of directors and banks who provide finance etc. However, care must be taken to ensure that management does not take action to boost performance in the short-term to the detriment of the long-term wealth of the shareholders (**‘short-termism’**).

### **C. PUBLIC SECTOR/NOT-FOR-PROFIT ORGANISATIONS**

The objectives of public sector/not-for-profit organisations are likely to be strongly influenced by the government/promoters and not primarily financial. These organisations exist to provide a service (e.g. Rwanda Partners or Public Service Commission etc.) and to ensure that social needs are satisfied and financial requirements may be seen as **constraints** and not objectives. They are not usually profit maximising, although subsidiary objectives may be concerned with earning an acceptable return on capital employed.

In the private sector the effects of investments (and associated financing and dividend decisions) on share price and shareholder wealth will be considered. As there are no share prices in not-for-profit organisations and investor wealth maximisation is not the assumed objective, some private sector investment appraisal techniques will not be appropriate. However, some private sector financial management techniques can be used - e.g. discounted cash flow is often used.

### **D. CORPORATE SOCIAL RESPONSIBILITY**

Corporate Social Responsibility is often used to describe the actions of a private, commercial organisation assuming a responsible view of its wider obligations to society. Corporate Social Responsibility has been otherwise defined as:

“fulfilling a role wider than your strict economic role” or: “acting as a good corporate citizen”.

The theory of business finance is that the prime objective of management of a listed company is to maximise the wealth of its ordinary shareholders. Agency theory dictates that management, as agents of the company’s owners, must act in their best interests and, thus, strive to maximise shareholders wealth at all times. In their attempt to achieve this prime objective management will set financial objectives, including:

- Profit levels
- Sales and profit growth
- Margin improvement
- Cost releasing efficiency savings
- EPS growth

Management will also set non-financial objectives, which should complement and support the financial objectives. These may include:

- Brand awareness levels
- Research & development successes

- New product development
- New markets entered
- Customer satisfaction levels
- Employee motivation levels

Such objectives may also include the following:

- Providing for the welfare of employees and management
- Upholding responsibilities to customers and suppliers
- Provision of a service.
- Contributing to the welfare of society as a whole
- Environmental protection

Which, may be loosely described as acting in a socially responsible manner. This has led to the development of the concept of Corporate Social Responsibility

Likewise, companies have been alleged to have acted in a less than socially responsible manner.

The extent to which organisations subscribe to Corporate Social Responsibility varies greatly both ideologically and in practice. Recent research in Ireland has shown that 90% of companies believed that Corporate Social Responsibility should be part of a company's DNA, yet only 30% thereof actually did anything about it.

Many organisations view Corporate Social Responsibility as a strategic investment and consider it necessary in order to achieve the reputation that is gaining importance in attracting and retaining key staff and to winning and retaining prestigious contracts and clients. Many such companies have moved to adopt Corporate Social Responsibility formally. This has been achieved in many ways including:

- Incorporating Corporate Social Responsibility in their mission statements
- Appointing a 'champion' of Corporate Social Responsibility
- Formally incorporating Corporate Social Responsibility objectives into its strategic planning process
- Dissemination of Corporate Social Responsibility targets and reporting of key performance indicators
- Retaining consultants to advise on existing performance and to recommend improvements
- Appointment of committees to implement and reviews Corporate Social Responsibility related policies.

Whilst, some organisations see social responsibility as a passing trend and are content to get by with a bit of 'lip service' and tokenism, other organisations view Corporate Social Responsibility as the preserve of multinationals and government. Part of the challenge in



pursuing Corporate Social Responsibility related objectives lies in the relative novelty of the concept. The critical debate is whether or not Corporate Social Responsibility detracts from the objective of maximising shareholder wealth. As with all debates there are opposing views including:

Arguments in favour of Corporate Social Responsibility include that it:

- Creates positive Public Relations for the organisation, or, as a minimum avoids bad public relations.
- Helps attract new and repeat custom
- Improves staff recruitment, motivation and retention
- Helps keep the organisation within the law,

All of which may be considered to support the drive to optimise profits.

However, there are many writers who vigorously oppose the notion that private organisations should embrace social responsibility. Some of the main arguments against Corporate Social Responsibility are:

- Market capitalism is the most equitable form of society that has ever appeared
- The ethics of doing business are not those of wider society
- Governments are responsible for the well- being of society
- An organisation's maximum requirement is to remain within the law, no more than this is required.

Ultimately, they argue that business organisations are created and run in order to maximise returns for their owners and that Corporate Social Responsibility detracts from the profit maximisation

### **Conclusion**

The broad philosophical debate on the role of companies in society is still in its early days. Depending on your viewpoint, Corporate Social Responsibility may be considered to support or detract from the objective of maximising shareholder wealth. Neither viewpoint is definitive.

As the public debate on Corporate Social Responsibility and the changing role of business in society intensifies, companies will need to determine their own view on Corporate Social Responsibility and adopt their own stance on the subject. Ultimately, they will have to make policy decisions that are in the best interests of the company and its owners, their shareholders.

## **E. IMPACT OF GOVERNMENT ON ACTIVITIES**

There are a number of areas where the Government plays a role in the financial arena:

- **Taxation** - Corporate (Capital Allowances etc.) & Personal **Monetary Policy** – Rates of Inflation, Interest Rates, Exchange Rates etc.

- **Investment Incentives Offered** - Grants, Subsidies etc.
- **Legislation** – Company Law, Monopolies, Competition, Environmental etc.
- **Duties, Tariffs** etc.

## **F. COMPOSITION OF SHAREHOLDERS**

Is there anything to be gained from a company knowing the composition of its shareholders?. Generally, it is useful as it may assist the company in framing its policy/approach in a number of areas e.g.

- **Dividend** Policy
- Attitude to **Risk/Gearing**
- **Unwelcome Bid** - support critical
- How **Performance** is Measured
- Recent Shareholder **Changes** => Price Movements

## **Study Unit 2**

### **Corporate Governance**

#### **Contents**

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##### **A. Introduction**

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##### **B. Best Practice**

## **A. INTRODUCTION**

Corporate Governance can be defined as the system by which organizations are directed and controlled.

## **B. BEST PRACTICE**

A “Code of Best Practice” should outline the recommendations listed below:-

Some of the main recommendations are:

1. The roles of chairman and chief executive should generally be separate. Whether or not the roles are combined, a senior non-executive director should be identified.
2. Non-executive directors should comprise at least one-third of the membership of the board and the majority of non-executive directors should be independent.
3. Boards should establish a Remuneration Committee, made up of independent non-executive directors, to develop policy on remuneration and devise remuneration packages for individual executive directors.
4. Each company should establish an Audit Committee of at least three non-executive directors, at least two of them independent. The audit committee should keep under review the overall financial relationship between the company and its auditors, to ensure a balance between the maintenance of objectivity and value for money.
5. Disclosure of directors’ total emoluments, including pension contributions and stock options. Separate figures for salary and performance-related elements and the basis on which performance is measured.
6. Directors should report on internal controls.
7. The accounts should contain a statement of how the company applies the corporate governance principles and explain the policies, including any circumstances justifying departure from best practice.

## **Study Unit 3**

### **Investment Appraisal - Introduction**

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#### **A. Nature and Stages of Investment Appraisal**

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#### **B. Investment Appraisal Techniques**

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#### **C. Relevant Cash Flows**

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## A. NATURE AND STAGES OF INVESTMENT APPRAISAL

### Nature

- Replacement Investment
- Investment for Expansion
- Product Improvement/Cost Reduction
- New Ventures
- Strategic Investment – may satisfy overall objectives but might **not** satisfy normal financial criteria.
- Statutory Requirements/Employee or Community Welfare – may not produce a positive NPV but may be essential.

### Stages

1. Identification.  
Ideas may generate from all levels of the organisation. Initial screening may reject those that are unsuitable - technically/too risky/cost/incompatible with company objectives etc. The remainder are investigated in greater depth - assumptions required regarding sales, costs etc./collect relevant data. Also consider alternative methods of completing projects.
2. Evaluation  
Identification of expected incremental cash flows. Measure against some agreed criteria - Payback/Accounting Rate of Return/Net Present Value/Internal Rate of Return. Consider effect of different assumptions - Sensitivity Analysis or other techniques. Consultation with other interested parties (particularly if great organisational and/or technological change) - accountants/production staff/marketing staff/trade unions etc.
3. Authorisation  
Submit to appropriate management level for approval/rejection/modification. The larger the expenditure, the higher the management level. Reappraise investment - reassess assumptions and cash flows (e.g. check for any "bias" in estimates)/evaluate how investment fits within corporate strategy and capital constraints (if any). If budgetary or other constraints exist, rank as to how essential (financial and non-financial considerations).
4. Monitor & Control  
Regularly review to ascertain if any major variations from cash flow estimates. If significant variations - consider continuation v abandonment. Post audits (one or two years after implementation!) are useful - encourage more realistic estimates at evaluation stage/help to learn from past mistakes/basis for corrective action to existing investments.

## B. INVESTMENT APPRAISAL TECHNIQUES

There are many techniques for evaluating investment proposals. These can be broadly classified as:

### Non-Discounting

Payback Period

Accounting Rate of Return (ARR)

### Discounted Cash Flow

Net Present Value (NPV)

Internal Rate of Return (IRR)

## Payback Period

**Definition:** The time taken **in years** for the project to recover the initial investment.

The **shorter** the payback, the more valuable the investment.

### Example

An initial investment of RWF50,000 in a project is expected to yield the following cash flows:

	<b>Cash Flow</b>
Year 1	RWF20,000
Year 2	RWF15,000
Year 3	RWF10,000
Year 4	RWF10,000
Year 5	RWF8,000
Year 6	RWF5,000

The Payback Period is 3 1/2 years - the cash inflows for that period equal the initial outlay of RWF50,000.

Is 3 1/2 years acceptable? - It must be compared to the target which management has set. For example, if all projects are required to payback within, say, 4 years this project is acceptable; if the target payback is 3 years then it is not acceptable.

Although of limited use it is the most popular technique.

It is often used in conjunction with other techniques.

It may be used as an initial screening device.

### Advantages

- Calculation is simple.
- It is easily understood

- It gives an indication of liquidity.
- It gives a measure of risk - later cash flows are more uncertain.
- It considers cash flow rather than profit – profit is more easily manipulated.

#### Disadvantages

- Cash flows after the Payback Period are ignored.
- It ignores the timing of the cash flows (“Time Value of Money”).
- No clear decision is given in an accept/reject situation.

### **Accounting Rate of Return (ARR)**

#### ***Definition:***

$$\text{ARR} = \frac{\text{Average Annual Accounting Profits}}{\text{Initial Investment}} = \%$$

(Alternative definitions may be used occasionally - e.g. ‘Average Investment’ may replace ‘Initial Investment’).

The Accounting Rate of Return is based upon accounting profits, not cash flows.

#### Example

A company is considering an investment of RWF100,000 in a project which is expected to last for 4 years. Scrap value of RWF20,000 is estimated to be available at the end of the project. Profits (before depreciation) are estimated at:

Year 1	RWF50,000
Year 2	RWF50,000
Year 3	RWF30,000
Year 4	RWF10,000

#### **Find the Accounting Rate of Return**

Total Profits Before Depreciation		RWF140,000
Less Total Depreciation		(RWF80,000)
Total Accounting Profits		<u>RWF60,000</u>

$$\text{Average Annual Profits (4 years)} = \frac{\text{RWF60,000}}{4} = \text{RWF15,000}$$

$$\text{ARR} = \frac{\text{RWF15,000}}{\text{RWF100,000}} = \mathbf{15\%}$$

To ascertain if the project is acceptable the ARR must be compared to the target rate which management has set. If this target is less than 15% the project is acceptable; if greater than 15% the project is unacceptable.



### Advantages

- Calculation is simple.
- It is based upon profits, which is what the shareholders see reported in the annual accounts.
- It provides a % measure, which is more easily understood by some people.
- It looks at the entire life of the project.

### Disadvantages

- It is a crude averaging method.
- It does not take account of the timing of the profits.
- It is based on accounting profit which can be manipulated by creative accounting. Shareholders' wealth is determined by cash.
- Varied Definitions are used.

## **Discounted Cash Flow (DCF)**

The main shortcomings of the non-discounting techniques of Investment Appraisal can be summarised as:

- They do not allow for the **timing** of the cash flows/accounting profits
- They do not evaluate cash flows **after** the payback period
- They do not allow for the changing value of money over a medium to long term

Discounted Cash Flow addresses these shortcomings, by allowing for the “**time-value of money**” and looking at **all** cash flows. So what is discounting? Discounting can be regarded as Compound Interest in reverse. To understand Compound Interest let us take a simple example.

### Example

If you invest RWF100 and are guaranteed a return of 10% per annum we can work out how much your investment is worth at the end of each year.

<u>PRESENT VALUE</u>		<u>FUTURE VALUE</u>
End of Year 1 RWF100 x (1.10)	=	RWF110.00
End of Year 2 RWF100 x (1.10)(1.10)	=	RWF121.00
End of Year 3 RWF100 x (1.10)(1.10)(1.10)	=	RWF133.10
For simplicity this can be re-written		
RWF110.00	End of Year 1 RWF100 x (1.10) <sup>1</sup>	=

*1.1 to power of 1*

$$\begin{array}{l} \text{End of Year 2} \\ \text{1.1 to power of 2} \end{array} \text{ RWF100 x } (1.10)^2 = \text{RWF121.00}$$

$$\begin{array}{l} \text{End of Year 3} \\ \text{1.1 to power of 3} \end{array} \text{ RWF100 x } (1.10)^3 = \text{RWF133.10}$$

In general terms we can express this as:

$$\mathbf{PV (1 + i)^n = FV}$$

Where: PV = Present Value

i = Rate of Interest

n = Number of Years/Periods

FV = Future Value

We are starting with a Present Value (RWF100) and depending on the rate of interest used (i) (*above 10%*) and the duration of the investment (n) we can find the Future Value, using Compound Interest.

As mentioned above, Discounting is Compound Interest in **reverse**. Thus, using the statement

$PV (1 + i)^n = FV$  we can turn it around to get

$$\frac{FV}{(1 + i)^n} = PV \quad \text{or} \quad FV \times \frac{1}{(1 + i)^n} = PV$$

Again, taking the example above, if you are given the **Future Value** and asked to find the **Present Value**

	<u>FUTURE VALUE</u>		<u>PRESENT VALUE</u>
End of Year 1	RWF110.00 x $\frac{1}{1}$	=	RWF100 (1.10)
End of Year 2	RWF121.00 x $\frac{1}{2}$	=	RWF100 (1.10)
End of Year 3	RWF133.10 x $\frac{1}{3}$	=	RWF100 (1.10)

In effect, what you are doing is ascertaining the amount which must be invested **now** at 10% per annum to accumulate to RWF110 in a year's time (or RWF121.00 in two years; or RWF133.10 in three years).

In converting the Future Value to a Present Value it is multiplied by a factor (Discount Factor), which varies depending on the discount rate (i) selected and the number of years/periods (n) into the future. Fortunately, it is not necessary individually to calculate each factor, as these can be easily obtained from **DISCOUNTING TABLES** (attached). These tables supply a factor for all % rates and periods.

The previous example is reproduced using the Discounting Tables, at 10%

	<u>FUTURE VALUE</u>			<u>PRESENT VALUE</u>
End of Year 1	RWF110.00 x	.909	=	RWF100
End of Year 2	RWF121.00 x	.826	=	RWF100
End of Year 3	RWF133.10 x	.751	=	RWF100

The compounding and discounting features shown above relate to **single** payments or receipts at different points in time. Similar calculations can be done for a series of cash flows, where a single present value can be calculated by aggregating the present value of several future cash flows.

### ANNUITIES

An annuity is where there is a **series** of cash flows of the **same** amount over a number of years.

The present value of an annuity can be found by discounting the cash flows individually (as above).

### Example

Using a discount rate of 10% find the present value of an annuity of RWF2,000 per annum for the next four years, with the first payment due at the end of the first year.

<b>Year</b>	<b>Cash Flow</b>	<b>Disc. Factor (10%)</b>	<b>Present Value</b>
1	RWF2,000	0.909	RWF1,819
2	RWF2,000	0.826	RWF1,653
3	RWF2,000	0.751	RWF1,502
4	RWF2,000	0.683	RWF1,366
		Net Present Value	<u>RWF6,340</u>

However, a much quicker approach is to multiply the annual cash flow by an **annuity factor**. The annuity factor is simply the sum of the discount factors for each year of the annuity. In this example the annuity factor is 3.17 (0.909 + 0.826 + 0.751 + 0.683). If you multiply the RWF2,000 by the annuity factor of 3.17 you get RWF6,340, which is the same Net Present Value as the longer approach adopted in the example. Annuity factors are available for all % rates and periods in **Annuity Tables** (attached) and you will see the factor of 3.17 at period 4 under the 10% column.

In the above example the first receipt arose at the **end** of the first year. If this is not the case you can still use the Annuity Tables but you must modify your approach. The present value can be found by multiplying the annual cash flow by the annuity factor for the **last** date of the annuity less the annuity factor for the year **before** the first payment.

Example

Using a discount rate of 10% find the present value of an annuity of RWF5,000 per annum, which starts in year 5 and ends in year 10.

Annuity Factor Years 1 – 10	6.145
Annuity Factor Years 1 – 4	<u>3.170</u>
Annuity Factor Years 5 – 10	<u>2.975</u>

Therefore, the Present Value is RWF5,000 x 2.975 = RWF14,875.

PERPETUITIES

A perpetuity is an annuity which continues **forever**. To find the present value of a perpetuity which starts at year 1 you use the following simple formula:

$$PV = \frac{a}{i}$$

where: a = amount for perpetuity  
i = the discount rate

**Example**

The present value of a payment in perpetuity of RWF1,000 per annum, which commences at the **end of year 1**, at a discount rate of 10% is:

$$PV = \frac{a}{i} = \frac{\text{RWF1,000}}{.10} = \text{RWF10,000}$$

If the payment commences at a time other than year 1 a further calculation is required.

**Example**

Using a discount rate of 10% find the present value of a payment in perpetuity of RWRWF1,000 per annum, if it commences (a) end of year 1, (b) immediately - year 0, or (c) end of year 6.

(a) 
$$PV = \frac{a}{i} = \frac{\text{RWF1,000}}{.10} = \text{RWF10,000}$$

(b)  $PV = \text{RWF}10,000$  as at (a) + PV of RWF1,000 in year 0  
 $= \text{RWF}10,000 + \text{RWF}1,000 = \text{RWF}11,000$

(c) We can find this in two stages.

The PV **in year 5** of a perpetuity of RWF1,000 from year 6 onwards is

$$PV = \frac{a}{i} = \frac{\text{RWF}1,000}{.10} = \text{RWF}10,000$$

We must now convert this to a **year 0** value, by discounting the RWF10,000 (year 5 value) at 10%.

$$PV = \text{RWF}10,000 \times .621 (\text{Discount Factor for year 5 @ 10\%}) = \text{RWF}6,210$$

### **Net Present Value (NPV)**

This technique converts future cash flows to a common point in time (Present Value), by discounting them. The present values of the individual cash flows are aggregated to arrive at the Net Present Value (NPV).

The NPV figure represents the change in shareholders' wealth from accepting the project. It produces an **absolute value** (RWF) and therefore, the impact of the project is identified.

For independent projects the decision rule is:

**Accept** if the NPV is **positive**

**Reject** if the NPV is **negative**

For **mutually exclusive** projects (where it is only possible to select **one** of many choices) - calculate the NPV of each project and select the **one** with the highest NPV.

In calculating the NPV, the selection of a discount rate is vitally important. It is generally taken as the cost to the business of long-term funds used to fund the project.

### **Example 1 - Independent Project**

A company is considering a project, which is expected to last for 4 years, and requires an immediate investment of RWF20,000 on plant. Inflows are estimated at RWF7,000 for each of the first two years and RWF6,000 for each of the last two years. The company's cost of capital is 10% and the plant would have zero scrap value at the end of the 4 years.

Calculate the NPV and recommend if the project should be accepted.

YEAR	CASH FLOWS	DISC. FACTOR 10%	PRESENT VALUE
0	(20,000)	1.0	(20,000)
1	7,000	.909	6,364
2	7,000	.826	5,785
3	6,000	.751	4,508
4	6,000	.683	4,098
		Net Present Value	<u>+755</u>

The project should be accepted as it produces a positive NPV. This indicates that the project provides a return in excess of 10% (the discount rate used).

### Example 2 - Mutually Exclusive Projects

A company has RWF100,000 to invest. It is considering two mutually exclusive projects whose cash flows are estimated as follows:

YEAR	PROJECT A	PROJECT B
0	(100,000)	(100,000)
1	50,000	70,000
2	60,000	50,000
3	40,000	30,000

Which project should the company select if its cost of capital is 10%

YEAR	DISC FACTOR 10%	PRESENT VALUE	
		PROJECT A	PROJECT B
0	1.0	(100,000)	(100,000)
1	.909	45,450	63,630
2	.826	49,560	41,300
3	.751	30,040	22,530
	Net Present Value	<u>+ 25,050</u>	<u>+ 27,460</u>

Project B should be selected as it has the higher NPV.

### Advantages

- Correctly accounts for the time value of money.
- Uses all cash flows.
- Is an absolute measure of the increase in wealth
- Consistent with the idea of maximising shareholder wealth i.e. telling managers to maximise NPV is equivalent to telling them to maximise shareholder wealth.
- It can be used for benchmarking in post-audit review.

### Disadvantages

- Difficult to estimate cost of capital.
- Not easily interpreted by management i.e. managers untrained in finance often have difficulty in understanding the meaning of a NPV.

### **Internal Rate of Return (IRR)**

The NPV method produces an absolute value in currency (RWF). A positive NPV indicates that the project earns more than the required rate of return and should be accepted; a negative NPV indicates a return less than the required rate and rejection of the proposal.

The IRR is another discounted cash flow technique. It produces a percentage return or yield, rather than an absolute value. It is the discount rate at which the NPV would be zero - where the present value of the outflows = present value of the inflows. It can, therefore, be regarded as the expected earning rate of the investment.

If the IRR exceeds the company's target rate of return it should be accepted. If less than the target rate of return it should be rejected.

The IRR can be estimated by a technique called '**Linear Interpolation**'. This requires the following steps:

1. Calculate two NPV's, using two different discount rates.
2. Any two rates can be used but, ideally, one calculation will produce a positive NPV and the other a **negative** NPV.
3. Choosing the discount rate is a 'shot in the dark.' However, if the first attempt produces a positive NPV, generally a **higher** discount rate will be required to produce a negative NPV and vice versa.

**Example 3 - Internal Rate of Return**

Using the cash flows from example 1, a discount rate of 10% produced a positive NPV of RWF755. In an attempt to find a **negative** NPV try a higher rate of 15%.

YEAR	CASH FLOWS	DISC. FACTOR 15%	PRESENT VALUE
0	(20,000)	1.0	(20,000)
1	7,000	.869	6,083
2	7,000	.756	5,292
3	6,000	.658	3,948
4	6,000	.572	3,432
		Net Present Value	<u><u>( 1,245)</u></u>

We now know that the real rate of return is > **10%** (+ NPV) but < **15%** (- NPV). The IRR is calculated by 'Linear Interpolation.' It will only be an approximation of the actual rate as it assumes that the NPV falls in a straight line (linear) from + RWF755 at 10% to - RWF1,245 at 15%. The NPV, in fact, falls in a curved line but nevertheless the interpolation method is accurate enough. In this example the IRR is:

$$10\% + \frac{755}{755 + 1,245} \times (15\% - 10\%) = \mathbf{11.9\%}$$

**Advantages**

- Often gives the same decision rule as NPV.
- More easily understood than NPV.
- Doesn't require an exact definition of "r" in advance.

- Considers the time value of money.
- Considers all relevant cash flows over a project's life.

#### Disadvantages

- Relative, not absolute return -> ignores the relative size of investments.
- If there is a change in the sign of the cash flow pattern, one can have multiple IRR's.
- NPV is much easier to use for benchmarking purposes in a post-audit situation than IRR.
- It looks at projects individually – the results cannot be aggregated.
- It cannot cope with interest rate changes.

#### **DCF Techniques v Non-DCF Techniques**

DCF techniques have advantages over non-DCF techniques:

1. They allow for the '*time value of money.*'
2. They use *cash flows*, which result from an investment decision. The ARR technique is affected by accounting conventions (e.g. depreciation, deferred expenditure etc.) and can be susceptible to manipulation.
3. They take account of *all cash flows*. The Payback Period disregards cash flows after the payback period.
4. **Risk** can be easily incorporated by adjusting the discount rate (NPV) or cut-off rate (IRR).

#### **Advantages of IRR Compared To NPV**

It gives a *percentage rate or return*, which may be more easily understood by some.

To calculate the IRR it is *not necessary to know in advance* the required rate of return or discount rate, as it would be to calculate the NPV.

#### **Advantages of NPV Compared To IRR**

It gives an absolute measure of profitability (RWF) and hence, shows immediately the change in shareholders' wealth. This is consistent with the objective of shareholder wealth maximisation. The IRR method, on the other hand, ignores the relative size of investments.

It always gives only one solution. The IRR can give multiple answers for projects with non-conventional cash flows (a number of outflows occur at different times).

It *always* gives the correct ranking for mutually exclusive projects, whereas the IRR technique may give conflicting rankings.

Changes in *interest rates* over time can easily be incorporated into NPV calculations but not IRR calculations.



## C. RELEVANT CASH FLOWS

In an examination question you will be given much information regarding the impact on the organisation of a new investment proposal etc. Some of the information may not be relevant to the decision and it is important that you are able to figure out which flows are relevant and should be included in an investment appraisal calculation.

For example, suppose you were asked to evaluate whether a U.K. organisation should establish a subsidiary in the USA and the following paragraph appeared halfway through the question:

‘...The company currently exports to the USA, yielding an after-tax net cash flow of GBP100,000. No production will be exported to the USA if the subsidiary is established. It is expected that new export markets of a similar worth in Southern Europe could replace exports to the USA. Home production is at full capacity and there are no plans for further expansion in capacity’.

This lengthy paragraph is, obviously, designed to confuse you. If we analyse it further we find that it is merely saying that the organisation currently exports GBP100,000 worth of goods to the USA which will be replaced by GBP100,000 of new exports to Southern Europe, if we establish the subsidiary. Thus, it has a neutral impact on our decision and can be omitted from the appraisal.

The following pointers and simple examples should assist in coping with the various items which are presented to you in an examination:

### 1. CASH FLOWS v PROFITS

Shareholders' wealth is based upon the movement of cash. Accounting policies and conventions have no effect on the value of the firm and, thus, pure accounting or book entries should be excluded from calculations. The most common of these is depreciation, which should be excluded as it is a non-cash item.

#### Example

A company is considering investing in a new project which requires the expenditure of RWF12m. immediately on plant. The project will last for 5 years and at the end of the project the plant is expected to have a scrap value of RWF2m. The company normally depreciates plant over 5 years using the straight-line method.

In this simple illustration the last sentence concerning depreciation can be ignored completely as it does **not** affect the cash flows. It would be incorrect to show an outflow of RWF2m p.a. for depreciation. The relevant cash flows are the outflow of RWF12m. on plant in year 0 and the inflow of RWF2m as scrap in year 5.

### 2. CASH FLOWS SHOULD BE INCREMENTAL

The effect of a decision on the company's overall cash flows must be considered in order to determine correctly the changes in shareholders' wealth.

### Example

A company is considering a proposal which would require (amongst other cash flows) the purchase of a new machine for RWF100,000. If it proceeds with the proposal it could dispose of an existing machine which has a book written-down value of RWF30,000. This machine could be sold immediately for RWF20,000 instead of waiting for 5 years as planned and selling it for scrap value of RWF5,000. Should the existing machine be taken into account in evaluating the new proposal ?

Undertaking the new proposal requires the purchase of a new machine which, in turn, enables the existing machine to be sold, thereby generating an inflow for the organisation. Thus, the cash flows associated with the existing machine are relevant in evaluating the new proposal. The present written-down value of RWF30,000 is not relevant as it is merely an accounting book entry. The sale proceeds of RWF20,000 is obviously relevant as is the **loss** of RWF5,000 scrap value which the company would have received in year 5 if the new proposal was not undertaken.

The relevant cash flows are:

Year	New Machine	Sale – Existing Machine	Scrap Foregone Existing Machine	Net Cash Flows
0	(100,000)	20,000		(80,000)
1				
2				
3				
4			(5,000)	(5,000)
5				

### 3. OVERHEADS

Variable overheads will **always** be relevant in decision making. However, depending on the situation fixed overheads may or may not be relevant. If fixed overheads are allocated on some arbitrary basis (e.g. on the basis of machine or labour hours) they are not usually relevant. However, if the total fixed costs of the organisation are affected by the proposal then they are relevant and should be incorporated as a cash flow.

### Example

A company is considering the introduction of a new product to its existing range. Each product will take two hours labour to manufacture. Fixed overheads are allocated within the company on the basis of RWF1 per labour hour. Sales of the new product are estimated at 12,000 units per annum. If the new product is manufactured the company will have to employ an additional supervisor at a salary of RWF20,000 per annum.

The allocation of fixed overheads at the rate of RWF2 per unit has no effect on cash flows and is **not** relevant. It is merely an accounting entry for costing or control purposes.

The additional supervisory salary of RWF20,000 per annum **is** relevant, as it is incurred solely as a result of the new proposal and must be taken into account.

### **Example**

A company is considering the introduction of a new product to its existing range. It currently rents a factory at an annual rental of RWF100,000. Only three-quarters of the factory is used on production of its existing range of products and the remaining quarter of the factory would be adequate in which to produce the new product. However, it will be necessary to rent additional warehouse space at RWF20,000 per annum in order to store the new production.

To produce the new product the organisation can utilise factory space which is currently idle. **No additional** factory rental costs will be incurred by the company and it would be incorrect to show an annual cash outflow of RWF25,000 (one-quarter) in respect of rent when evaluating the new proposal.

On the other hand, the additional warehouse rent of RWF20,000 per annum is **incurred solely** as a result of the new proposal and must be taken into account in the evaluation process.

## **4. SUNK COSTS**

Sunk costs (or past costs) are costs which have already been incurred. When making an investment decision sunk costs can be **ignored** and you need only consider future incremental cash flows.

### **Example**

A company is considering the introduction of a new type of widget. Over the past two years it **has** spent RWF100,000 on research and development work.

The RWF100,000 spent on research and development is a sunk cost and can be ignored when evaluating the future inflows and outflows of the proposal. One way of looking at it is that whether you decide to go ahead with the new proposal or not this will not alter the position of the RWF100,000 - it **has** already been incurred.

### **Example**

A company uses a special raw material, named Zylon, in production. It currently has 5,000 tons in stock. The company is considering a once-off project which would use 2,000 tons of Zylon. The original cost of the Zylon in stock was RWF20 per ton; the current purchase price is RWF17 per ton and its resale value is RWF10 per ton.

What is the relevant cost of the Zylon for the project if :

- (a) It is **regularly used** by the company ?
  - (b) It is **no longer used** and any remaining stock will be sold off immediately ?
- 
- (a) The original cost of RWF20 per ton is **not** relevant. The 2,000 tons used on this project are taken out of stock and must be replaced at the current purchase price,

as the Zylon is regularly used by the company. Thus, **current purchase price** is the relevant cost - 2,000 tons @ RWF17 = **RWF34,000**.

- (b) Again, the original cost of RWF20 per ton is **not** relevant. If the company does not use the existing stock in the new project the next best use is to dispose of it at RWF10 per ton, as it is no longer used in production. Thus, **current resale value** is the relevant cost - 2,000 tons @ RWF10 = **RWF20,000**.

## 5. OPPORTUNITY COSTS

The use of resources for a new project may divert them from existing projects, thereby causing opportunity costs. These opportunity costs must be taken into account in evaluating any new project.

### Example

A company is considering the introduction of a new range of advanced personal computer, which will be very competitively priced. While accepting that the new machine is vital to remain competitive, the marketing manager has estimated that sales of existing models will be reduced by 100 units per annum for the next three years as a consequence. The existing model sells for RWF3,000 and variable costs are RWF1,750 per unit.

In evaluating the introduction of the new advanced machine, the **lost contribution** from reduced sales of existing models must be included as an opportunity cost. In this case the opportunity cost is RWF125,000 [100 units x (RWF3,000 - RWF1,750)] per annum for the next three years.

## 6. INTEREST COSTS

In many examination questions you will be presented with all the costs of the proposed project. These may be presented in the form of a standard Profit & Loss Account. One of these costs may be 'Interest.' The figure for interest should **not** be included as a relevant cost because the cost of finance, no matter what its source, is encompassed within the discount rate. Therefore, to include the annual interest charge as a relevant cost and to also discount the cash flows would result in double counting.

## 7. WORKING CAPITAL

Where the project requires an investment of, say RWF50,000, for working capital it should be remembered that working capital revolves around continuously in the project (e.g. purchase of raw materials, which are used to manufacture goods, sold and eventually generate cash to enable the purchase of more raw materials etc.. and continuously repeat the cycle). Thus, the RWF50,000 flows back into the organisation once the project ceases. In this example, if the project has a life of five years the cash flows relating to working capital are:

Year	Working Capital
0	(50,000)
5	50,000

## **Study Unit 4**

### **Investment Appraisal – Impact of Taxation**

#### **Contents**

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##### **A. Introduction**

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##### **B. Corporation Tax**

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##### **C. Capital Allowances**

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##### **D. Timing of Taxation Effects**

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##### **E. Worked Examples**

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## A. INTRODUCTION

To appraise fully an investment, management must take account of the impact of taxation, as it is the after-tax cash flows that are relevant to decision making.

As a result of accepting a project tax payments or savings will, generally, be made by the company. These relate to:

1. Corporation Tax payments on profits.
2. Tax benefits due to capital allowances granted on certain expenditure.

## B. CORPORATION TAX

Annual cash inflows from a project will cause an increase in taxable profits and, hence, a tax payment. Annual cash outflows (e.g. cost of materials, labour etc.) will reduce taxable profits and yield tax savings. However, tax payments or savings can be based upon the **net** cash inflows or outflows each year.

One can assume that an annual cash flow (inflow or outflow) will produce a similar change in taxable profits, unless the exam question specifically indicates otherwise. For example, you may be told that a particular item of expenditure (say, a contract termination payment of RWF100,000) is **not** allowable for tax purposes. In this instance, the RWF100,000 must be shown as an outflow of the project but it is ignored when calculating the taxation effect.

It is important to appreciate that the taxation payment or saving is the cash flow multiplied by the rate of Corporation Tax. For example, if the net cash inflow in a particular year is RWF50,000 and the rate of Corporation Tax is 40% an outflow of RWF20,000 (RWF50,000 x 40%) is shown in the taxation column.

## C. CAPITAL ALLOWANCES

The Rwandan Revenue Authority does not allow depreciation charges as a deduction in calculating the tax payable. However, it does grant capital allowances, which can be quite generous. These allowances on capital items can be set-off against taxable profits to produce tax savings (i.e. cash inflows).

The capital allowances can take various forms. The most common are:

1. **40% initial allowance**, whereby an allowance equivalent to the full cost of the item is treated as allowable depreciation in the first year.

Again, it is important to appreciate that the cash flow effect is the capital allowance multiplied by the rate of Corporation Tax. For example, if the capital expenditure (which qualifies for 40% allowances) in a particular year is RWF50,000 and the rate of Corporation Tax is 40% then a saving of RWF20,000 (RWF50,000 x 40%) is shown in the taxation column.

The eventual sale of capital items will usually cause a balancing **charge** or a balancing **allowance**, which must also be taken into account in the project appraisal.

#### **D. TIMING OF TAXATION EFFECTS**

Unless specifically advised to the contrary in an examination, assume that there is a time lag of **one** year between a cash flow and the corresponding taxation effect. Thus, expenditure on a capital item in year 0 will usually be accompanied by a tax saving in year 1.

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## **Study Unit 5**

### **Investment Appraisal – Impact of Inflation**

#### **Contents**

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#### **A. Introduction**

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#### **C. Real v Nominal/Money Discount Rates**

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#### **C. Handling Different Rates of Inflation**

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#### **D. General Considerations - Inflation**

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## A. INTRODUCTION

To illustrate how inflation should be handled in Investment Appraisal we shall take a simple example, under two different scenarios – an environment with no inflation and an environment where inflation is present:

1. **No Inflation** – suppose you are considering the purchase of a television for RWF1,000. I am undertaking a simple one-year project and I require RWF1,000. I approach you and guarantee you a return of 5% on your investment. Your investment will have grown to RWF1,050 at the end of the year and, in theory, because there has been no inflation the price of the television should still be RWF1,000. Thus, you have made RWF50 in the process and also got your television. Therefore, you have achieved a **real return** of 5%.
2. **Inflation (assume 20% per annum)** – using the same example as number 1. If you had given me the RWF1,000 this would be worth RWF1,050 at the end of the year but the price of the television would probably have risen to RWF1,200 (+20%) because of inflation, so you would not be able to afford it. The value of your savings has been eroded because of inflation – you have got a return of 5% in money terms but inflation has been running at 20%. Therefore, you have not got a **real return** of 5% - this is only a **nominal (or money) return**. In this instance, with inflation of 20% you would require a nominal (money) return of 26% in order to obtain a real return of 5%.

Obviously, there is a link between the nominal (or money) rate of return (**26%**), the real rate of return (**5%**) and the rate of inflation (**20%**). This relationship may be expressed as follows:

$$(1 + \text{Real Rate}) = \frac{(1 + \text{Nominal Rate})}{(1 + \text{Inflation Rate})}$$

Using the figures in the above example:

$$\frac{1.26}{1.20} = 1.05$$

If you have any two variables you can find the third. For example, if you require a real return of 5% from an investment and you estimate inflation to be 20% you can work out the required nominal return at 26% as follows:

$$\begin{array}{rclcl} (1 + \text{Real Rate}) & \times & (1 + \text{Inflation Rate}) & = & (1 + \text{Nominal Rate}) \\ (1.05) & \times & (1.20) & = & (1.26) \end{array}$$

## B. REAL v NOMINAL (MONEY) DISCOUNT RATES

Now that you know the difference between a real and a nominal rate of return (or discount rate) which rate should be used in discounting the cash flows of a project? This really depends on how the **cash flows** are expressed. They can be stated either as:

1. **Real Cash Flows** – stated in today’s prices and **exclude** any allowance for inflation.
2. **Nominal/Money Cash Flows** – these **include** an allowance for inflation and are stated in the actual RWF’s receivable/payable.

As a very simple illustration, an examination question might state (amongst other things) ...”materials for the project cost RWF10 per unit in terms of today’s prices. Inflation is expected to run at the rate of 10% per annum and the project will last for three years.”

We can express the cash flows in either real or nominal terms:

<b>YEAR</b>	<b><u>REAL</u> CASH FLOWS</b>	<b><u>MONEY</u> CASH FLOWS</b>
1	RWF10	RWF10 x (1.10) = RWF11.00
2	RWF10	RWF10 x (1.10) <sup>2</sup> = RWF12.10
3	RWF10	RWF10 x (1.10) <sup>3</sup> = RWF13.30

The rules for handling inflation are quite straightforward:

If the cash flows are expressed in **real terms** (today’s money), use the **real discount** rate.

If the cash flows are expressed in **money terms** (the actual number of RWF that will be received/paid on the various future dates), use the **nominal/money discount rate**.

No matter which approach is used you should get the same result.

**Example:**

A company is considering a project which will last for three years. The initial cost is RWF100,000 and cash inflows of RWF60,000, RWF50,000 and RWF40,000 respectively are anticipated for the three years. These inflows are expressed in **current values** and do not take account of any projected inflation. It is estimated that inflation will be 20% per annum for the life of the project. The investment will have no residual value at the end of the project. The company’s required rate of return in money terms is 26%.

**First Approach – Real Cash Flows & Real Discount Rate**

$$(1 + \text{Real Rate}) = \frac{(1 + \text{Nominal Rate})}{(1 + \text{Inflation Rate})}$$

$$\frac{1.26}{1.20} = 1.05$$

Year	Real Cash Flows	Dis. Factor 5%	Pres. Value
0	(100,000)	1.000	(100,000)
1	60,000	.952	57,120
2	50,000	.907	45,350
3	40,000	.864	34,560
			<u>37,030</u>

### Second Approach – Money Cash Flows & Money Discount Rate

We already have a money rate (26%) but we need to re-express the cash flows in money terms by inflating them at 20% per annum.

Year	Real Cash Flows	Money Flows	Dis. Factor 26%	Pres. Value
0	(100,000)	(100,000)	1.000	(100,000)
1	60,000	x 1.20 = 72,000	.794	57,168
2	50,000	x (1.20) <sup>2</sup> = 72,000	.630	45,360
3	40,000	x (1.20) <sup>3</sup> = 69,120	.499	34,491
				<u>37,019</u>

Allowing for some rounding, the same answer is produced under each approach.

So which approach should be used? In most cases it is probably best to inflate the cash flows to money cash flows and then discount at the money required rate of return. Among the reasons for suggesting this are:

Different inflation rates may apply to different variables. For example, raw materials may inflate at 5% per annum, labour at 3% per annum etc. Thus, in converting a money rate to a real rate, which inflation rate do you divide by – 5% or 3%?

When converting a money rate to a real rate you often end up with fractions. For example, where the money rate of return is 15% and inflation is expected to be 5% per annum, this translates to a real rate of 9.52%. This rate may be difficult to handle as Discount Tables tend to be produced for whole numbers only.

When taxation is included in the appraisal capital allowances are based on **original**, rather than replacement cost and do not change in line with changing prices. Therefore, if the cash flows are left in terms of present day prices and discounted at the real discount rate it would understate the company's tax liability.

### **C. HANDLING DIFFERENT INFLATION RATES**

Where different inputs inflate at different rates the best approach is to inflate each element by the appropriate inflation rate and then to discount the net cash flows (which are now in money terms) by the money rate of return.

**Example:**

A company is considering a new project which would cost RWF60,000 now and last for four years. Sales revenue is expected to be RWF50,000 per annum. Raw materials will cost RWF10,000 in the first year and will rise thereafter by 5% per annum because of inflation. Labour costs will be RWF15,000 in year 1 and agreement has just been concluded, whereby increases of 4% per annum will apply for the following three years. No residual/scrap value will arise at the end of the project. Due to the current competitive environment it will not be possible to increase selling prices.

The general rate of inflation is expected to be 8% per annum for the next few years. The company's required money rate of return is 15%. Should the project be undertaken?

Year	Investment	Sales (Fixed)	Material (+5%)	Labour (+4%)	Net	D.F. 15%	Pres. Value
0	(60,000)				(60,000)	1.000	(60,000)
1		50,000	(10,000)	(15,000)	25,000	.870	21,750
2		50,000	(10,500)	(15,600)	23,900	.756	18,068
3		50,000	(11,025)	(16,224)	22,751	.658	14,970
4		50,000	(11,576)	(16,873)	21,551	.572	12,327
							<u>7,115</u>

As the project produces a positive NPV it should be accepted.

**D. GENERAL CONSIDERATIONS - INFLATION**

- **Planning** – more difficult
- **Project Appraisal** – another complication
- **Interest Rates** – higher nominal rates
- **Capital** – additional capital required
- **Borrowings** – extra borrowings => increased financial risk for shareholders
- **Nature of Borrowings** – long v short; fixed v floating; foreign borrowings?
- **Selling Prices** – can increase in costs be passed on?
- **Impact on Customers** – delayed payment; bad debts; liquidations etc.

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## **Study Unit 6**

### **Asset Replacement**

#### **Contents**

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##### **A. Introduction**

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##### **B. Equivalent Annual Cost**

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## A. INTRODUCTION

An organisation may be faced with a decision on the best policy regarding the replacement of assets. If the asset is to be replaced with an “identical asset” the question is how long to retain the asset and the optimum interval between replacement ?

When making this decision the cash flows which must be considered are:

- Capital Cost – the more frequent the replacement cycle, the more frequently this will be incurred.
- Maintenance/Running Cost – this tends to increase with the age of the asset.
- Resale/Residual Value – this tends to decrease with the age of the asset.

## B. EQUIVALENT ANNUAL COST

One method of identifying the optimum replacement cycle for an asset is to calculate the Equivalent Annual Cost (EAC).

This technique examines the various replacement options and calculates the present value of the total costs, over one cycle only. For example, if a machine has a life of three years there are only three options – replace every year, every two years or every three years. For each option identify the cash flows over one cycle:

- Replace **every** year - identify cash flows over a one year cycle
- Replace every **two** years – identify cash flows over a two year cycle
- Replace **every** three years – identify cash flows over a three year cycle

Finally, having obtained the present value of the cash flows over each cycle, convert them to an Equivalent Annual Cost by dividing the total costs by the appropriate annuity factor (one year; two year or three year).

### Example

A machine has a life of three years and the following running costs and resale value are estimated:

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Running Costs	15,000	20,000	25,000
Resale Value	35,000	25,000	15,000

The machine costs RWF50,000 and the company’s cost of capital is 10%. Identify how frequently the asset should be replaced.



The Cash Flows for each cycle are:

<b>Year</b>	<b>Replace Every Year</b>	<b>Replace Every 2 Years</b>	<b>Replace Every 3 Years</b>
0	(50,000)	(50,000)	(50,000)
1	20,000	(15,000)	(15,000)
2		5,000	(20,000)
3			(10,000)

The Present Values of the Cash Flows at 10% are:

<b>Year</b>	<b>Replace Every Year</b>	<b>Replace Every 2 Years</b>	<b>Replace Every 3 Years</b>
0	(50,000)	(50,000)	(50,000)
1	18,180	(13,635)	(13,635)
2		4,130	(16,520)
3			(7,510)
<b>PV Total Costs</b>	<b><u>(31,820)</u></b>	<b><u>(59,505)</u></b>	<b><u>(87,665)</u></b>
Equivalent Annual Cost	<u>(31,820)</u> 0.909	<u>(59,505)</u> 1.736	<u>(87,665)</u> 2.487
	= <b>(35,005)</b>	<b>(34,227)</b>	<b>(35,249)</b>

The optimum replacement cycle is every two years as this has the lowest cost.

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## **Study Unit 7**

### **Capital Rationing**

#### **Contents**

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##### **A. Introduction**

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##### **B. Ranking of Projects**

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##### **C. Possible Ways of Solving Capital Rationing**

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## A. INTRODUCTION

Capital Rationing is a situation where a company has insufficient capital to complete all projects which it would like to undertake (e.g. those with a positive NPV).

Broadly, Capital Rationing can be described as:

- **Soft Capital Rationing** – due to factors internal to the organisation. For example, projects are limited to funds available from retentions; management are unwilling to commit to additional debt due to the risk involved; the capacity of management to undertake many projects etc.
- **Hard Capital Rationing** – due to factors external to the organisation. For example, restrictions imposed on further borrowing due to a credit squeeze or lenders unwilling to provide further funds due to risk factors; stock market depressed and share issue not acceptable etc.

## B. RANKING OF PROJECTS

### Example

A company is reviewing its capital expenditure budget and has identified five projects. Its cost of capital is 10% and it has calculated the NPV of each project as follows:

Project	Capital Investment	NPV
A	100,000	10,000
B	400,000	36,000
C	300,000	21,000
D	600,000	51,000
E	700,000	62,000

The company only has RWF1.6m available for investment. Assume that the projects are divisible and calculate the optimum solution.

If capital was not rationed the company should undertake all projects because they all have positive NPV's. As capital is rationed (RWF2.1m. required to undertake all projects but only RWF1.6m. available) it is necessary to use a technique which links the NPV with the Capital Investment – calculate the **Profitability Index** (NPV per RWF of investment) and then rank the projects by their Profitability Index.

Project	Investment	NPV	Prof. Index			Ranking
A	100,000	10,000	10,000/100,000	=	0.10	1
B	400,000	36,000	36,000/400,000	=	0.09	2
C	300,000	21,000	21,000/300,000	=	0.07	5
D	600,000	51,000	51,000/600,000	=	0.085	4
E	700,000	62,000	62,000/700,000	=	0.088	3

### Optimum Solution

<b>Project</b>	<b>Investment</b>	<b>NPV</b>
A	100,000	10,000
B	400,000	36,000
E	700,000	62,000
D	400,000 (2/3 <sup>rd</sup> )	34,000 (2/3 <sup>rd</sup> )
	<u>1,600,000</u>	<u>142,000</u>

Thus, undertake all of projects A, B, and E and 2/3<sup>rd</sup> of project D. Project C is not undertaken. By doing only 2/3<sup>rd</sup> of project D (the projects are divisible) the entire RWF1.6m. of available funds are used.

If the projects are not divisible we must deal in whole projects. Calculate by “trial and error” the combination of various projects which will use up to RWF1.6m. and select the combination with the highest NPV. For example,

<b>Projects</b>	<b>Investment</b>	<b>NPV</b>
A, B, C, D	1,400,000	118,000
A, B, C, E	1,500,000	129,000
C, D, E	1,600,000	134,000

Thus, by undertaking projects C, D and E the highest combined NPV of RWF134,000 is achieved.

### **C. POSSIBLE WAYS OF SOLVING CAPITAL RATIONING**

1. Defer one or more projects to a later period when capital is not rationed
2. Share project(s) with another partner
3. Outsource part of a project (e.g. component)
4. Consider licensing/franchising
5. Seek alternative sources of funding (e.g. venture capital, sale & leaseback)

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## **Study Unit 8**

### **Working Capital Management**

#### **Contents**

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#### **A. Overview of Working Capital Management**

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#### **B. Cash Management**

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#### **C. The Management of Debtors**

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#### **D. The Management of Creditors**

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#### **E. The Management of Stocks**

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## A. OVERVIEW OF WORKING CAPITAL MANAGEMENT

### Definition of Working Capital

Working Capital (Net Current Assets) = Excess of Current Assets over Current Liabilities.

Current Assets: Stock (Finished Goods, WIP and Raw Materials), Debtors, Marketable Securities and Cash/Bank.

Current Liabilities: Creditors Due Within One Year, Trade Creditors, Prepayments received, Tax Payable, Dividends Payable, Short-term Loans and Long-term Loans Maturing Within the Year.

It may be regarded loosely as: **STOCKS + DEBTORS - CREDITORS**.

Working Capital Management is basically a trade off between ensuring that the business remains liquid while avoiding excessive conservatism, whereby the levels of Working Capital held are too high with an ensuing large opportunity loss. Obviously, the levels of Working Capital required depend to a large extent on the type of industry within which the company is operating ; contrast service industries with manufacturing industries.

### Matching Concept

Long-term assets must be financed by long-term funds (debt/equity). Short-term assets can be financed with short-term funds (e.g. overdraft, creditors) but it may be prudent to finance partly with long-term funds. Working capital policies can be identified as conservative, aggressive or moderate:

1. **Conservative** – financing working capital needs predominantly from long-term sources of finance. Current assets are analysed into permanent and fluctuating – long-term finance used for permanent element and some of the fluctuating current assets. This will increase the amount of lower risk finance, at the expense of increased interest payments and lower profitability.
2. **Aggressive** – short-term finance used for all fluctuating and most of the permanent current assets. This will decrease interest costs and increase profitability but at the expense of an increase in the amount of higher-risk finance used.
3. **Moderate (or matching approach)** – short-term finance used for fluctuating current assets and long-term finance used for permanent current assets.

Short-term finance is more *flexible* than long-term finance and usually cheaper. However, the trade-off between the relative cheapness of short-term debt and its risks must be considered. For example, it may need to be continually renegotiated as various facilities expire and due to changed circumstances (e.g. a credit squeeze) the facility may not be renewed. Also, the company will be exposed to fluctuations in short-term interest rates (variable).



### **Overtrading/Undercapitalisation**

This occurs where a company is attempting to expand rapidly but doesn't have sufficient long-term capital to finance the expansion. Through overtrading, a potentially profitable business can quite easily go bankrupt because of insufficient cash.

Output increases are often obtained by more intensive use of existing fixed assets and growth is financed by more intensive use of working capital. Overtrading can lead to liquidity problems that can cause serious difficulties if they are not dealt with promptly.

Overtrading companies are often unable or unwilling to raise long-term capital and rely more heavily on short-term sources (e.g. creditors/overdraft). Debtors usually increase sharply as credit is relaxed to win sales, while stocks increase as the company attempts to raise production at a faster rate ahead of increases in demand.

#### Symptoms of Overtrading

- Turnover increases rapidly
- The volume of current assets increases faster than sales (fixed assets may also increase)
- Increase in stock days and debtor days
- The increase in assets is financed by increases in short-term funds such as creditors and bank overdrafts
- The current and quick ratios decline dramatically and Current Assets will be far lower than Current Liabilities
- The cash flow position is heading in a disastrous direction.

#### Causes of Overtrading

- Turnover is increased too rapidly without an adequate capital base (management may be overly ambitious)
- The long-term sources of finance are reduced
- A period of high inflation may lead to an erosion of the capital base in real terms and management may be unaware of this erosion
- Management may be completely unaware of the absolute importance of cash flow planning and so may get carried away with profitability to the detriment of this aspect of their financial planning.

Possible means of alleviating overtrading are:

- Postponing expansion plans
- New injections of long-term finance either in terms of debt/equity or some combination
- Better stock/debtor control
- Maintaining/increasing proportion of long-term finance

### **Undertrading/Overcapitalisation**

Here the organisation operates at a lower level than that for which it is structured. As a result capital is inadequately rewarded. This can normally be identified by poor accounting ratios (e.g. liquidity ratios too high or stock turnover periods too long).

### **Assessment of Liquidity Position**

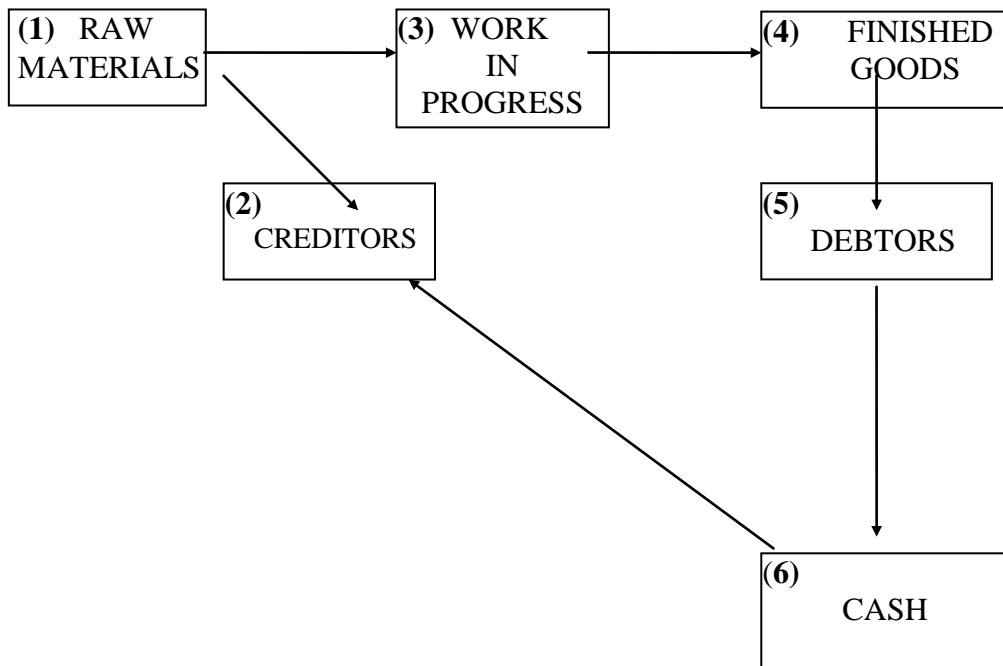
The liquidity position of an organisation may be assessed using some key financial ratios:

$$\begin{aligned} \text{Current Ratio} &= \frac{\text{Current Assets}}{\text{Current Liabilities}} \\ \text{Quick Ratio} &= \frac{\text{Current Assets} - \text{Stock}}{\text{Current Liabilities}} \\ \text{or ("Acid Test")} \\ \text{Debtors Collection Period} &= \frac{\text{Debtors}}{\text{Sales}} \times 365 \text{ days} \\ \text{Creditors Payment Period} &= \frac{\text{Creditors}}{\text{Purchases}} \times 365 \text{ days} \\ \text{Stock Period} &= \frac{\text{Stock}}{\text{Cost of Sales}} \times 365 \text{ days} \\ \text{Alternatively:} \\ \text{Stock Turnover Period} &= \frac{\text{Cost of Sales}}{\text{Stock}} = Y \text{ times} \end{aligned}$$

Benchmarks often quoted are a Current Ratio of 2 : 1 and a Quick Ratio of 1 : 1 but these should not be adopted rigidly as organisations have vastly different circumstances (operating in different industries, seasonal trade etc.).

### **Working Capital Cycle**

Often referred to as the "Operating Cycle" or the "Cash Cycle" this indicates the total length of time between investing cash in raw materials and its recovery at the end of the cycle when it is collected from debtors. This can be shown diagrammatically:



The Working Capital Cycle can also be expressed as a **period of time**, by computing various ratios:

Stock	$\frac{\text{Avg. Stock}}{\text{Cost of Sales}} \times 365$	=	Y days
Debtors	$\frac{\text{Avg. Debtors}}{\text{Sales}} \times 365$	=	D days
Less: Creditors	$\frac{\text{Avg. Creditors}}{\text{Purchases}} \times 365$	=	(C days)

**Working Capital Cycle (days)**

W days

It is difficult to determine the optimum cycle. Attention will probably be focussed more on individual components than on the total length of the cycle. Comparison with previous periods or other organisations in the same industry may reveal areas for improvement.

The factors determining the level of investment in current assets will vary from company to company but will, generally, include:

- **Working Capital Cycle** – companies with longer working capital cycles will require higher levels of investment in current assets.
- **Terms of Trade** – period of credit offered; whether discounts permitted.
- **Credit Policy** – company’s attitude to risk (“conservative” v “aggressive”).
- **Industry** – some industries have long operating cycles (e.g. engineering), whereas others have short cycles (supermarket chain)

## B. CASH MANAGEMENT

Cash is an idle asset and the company should try to hold the minimum sufficient for its needs.

Three motives are suggested for holding liquid funds (cash, bank deposits, short-term investments):

- **Transaction Motive** - to meet payments in the ordinary course of business – pay employees, suppliers etc. Depends upon the type of business, seasonality of trade etc.
- **Precautionary Motive** - to provide for unforeseen events e.g. fire at premises. Depends upon management's attitude to risk and availability of credit at short notice.
- **Speculative Motive** - to keep funds available to take advantage of any unexpected "bargain" purchases which may arise - e.g. acquisitions, bulk-buying etc.

### Cash Budget

A very important aid in cash management: most organisations, whether small or large multinationals, will prepare a Cash Budget at least once a year. It is usually prepared on a monthly/quarterly basis to predict cash surpluses/shortages.

#### Example

A company's sales are RWF100,000 for November and these are expected to grow at the rate of 10% per month. All sales are on credit and it is estimated that 60% of customers will pay in the month following sale; the remainder will pay two months after sale but on average 10% of sales will turn out to be bad debts. The company has some investments on which income of RWF20,000 will be received in February.

Materials must be purchased two months in advance of sale so that demand can be met. Materials cost 50% of sales value. The supplier of the materials grants one month's credit. Wages and overheads are RWF30,000 and RWF15,000 respectively per month.

A new machine costing RWF48,000 will be purchased in February for cash. The estimated life of the machine is 4 years and there will be no scrap value at the end of its life. Depreciation will be at the rate of RWF12,000 per annum and this will be charged in the monthly management accounts at RWF1,000 per month.

Rent on the company's factory is charged in the monthly management accounts at RWF5,000. This is paid half-yearly in March and September.

The company's fleet of cars will be replaced in January at a cost of RWF50,000.

At the 31st December the company expects to have a cash balance of RWF50,000.

Prepare a Cash Budget for the period **January to March**.

<b>(RWF'000)</b>	<b>January</b>	<b>February</b>	<b>March</b>
<u>Inflows</u>			
Sales Revenue:			
November	100,000 x 30%	30	
December	110,000 x 60% / 30%	66	33
January	121,000 x 60% / 30%		73
February	133,100 x 60%		80
Investment Income		20	
	<u>96</u>	<u>126</u>	<u>116</u>
<u>Outflows:</u>			
Materials:			
February	133,100 x 50%	67	
March	146,410 x 50%		73
April	161,051 x 50%		81
Wages		30	30
Overheads		15	15
Rent			30
Machine		48	
Car Fleet	50		
	<u>162</u>	<u>166</u>	<u>156</u>
Opening Balance	50	(16)	(56)
Inflows – Outflows	<u>(66)</u>	<u>(40)</u>	<u>(40)</u>
Closing Balance	<u>(16)</u>	<u>(56)</u>	<u>(96)</u>

The opening cash surplus of RWF50,000 turns into a negative figure from end of January onwards, mainly due to capital expenditure, and peaks at (RWF96,000) in March. Thus, the company will have to arrange an overdraft in advance to cover the shortfalls. Alternatively, the company could take action to avoid the potential negative results. Some possibilities are:

- Deferring replacement of fleet of cars.
- Deferring purchase of machine - impact on production and sales must be considered.
- Considering leasing cars/machine.
- Negotiating more generous credit period from supplier.
- Encouraging earlier payment by customers, possibly by offering a discount.
- Chasing bad debts and reducing below 10%.
- Liquidating investments - consider yield etc.
- Selling any non-essential assets
- Rescheduling loan repayments
- Reducing dividend payments
- Deferring Corporation Tax (penalties!)

### **Bank Overdraft**

This is one of the most important sources of short-term finance. It is a very useful tool in cash management, particularly for companies involved in **seasonal** trades.

The main **advantages** are:

- Cost may be lower than other sources (generally, short-term finance is cheaper than long-term).
- Less security required than for term loans - overdraft can be recalled at short notice.
- Repayment is easier as there are no structured repayments - funds are simply paid into the account as they become available.
- Interest is only charged on the amount outstanding on a particular day.
- Extra flexibility is provided as all of the facility may not be used at any one time. The unused balance represents additional credit which can be obtained quickly and without formality.

The main **disadvantages** are:

- Renewal is not guaranteed.
- Technically, the advance is repayable on demand - could lead to a strain on the company's cash flow.
- Variable rate of interest – the facility may be renewed on less favourable terms.

### **Term Loan**

Finance is made available for a fixed term and usually, at a fixed rate of interest. Repayments are in equal instalments over the term of the loan. Early repayment may result in penalties.

The main **advantages** are:

- The term can be arranged to suit the borrower's needs.
- The repayment profile may be negotiable to suit the expected cash flow profile of the company (e.g. interest only basis to keep ongoing repayments lower).
- Known cash flows assist financial planning.
- The interest rate is fixed, so the company is not exposed to increases in rates.

### **Cash Lodgement**

It is important that cash is lodged as quickly as possible so that the organisation gets the benefit through an increase in investments or a reduction in overdraft. However, apart from the security risk of cash lying idle there are costs of making lodgements (bank, clerical, transportation etc.) It becomes a "Balancing Act" to minimise costs and maximise benefits (interest).

### Example

A company always works off an overdraft which currently costs 15% p.a. Sales are RWF600,000 per week (5 working days). Half the cash is received on Monday and Tuesday, split equally between the two days. The remaining sales are split equally over the other days. At present all lodgements are made on Friday afternoon.

It is now proposed to lodge on Monday, Wednesday and Friday but this will increase administration and bank costs by RWF200 per week. Should the company change policy?

	<b>Receipts (RWF'000)</b>	<b>Day Banked</b>	<b>Days Saved</b>	<b>Overdraft Saving (RWF)</b>		
Monday	150	Monday	4	(150 x 4/365 x 15%)	=	246
Tuesday	150	Wednesday	2	(150 x 2/365 x 15%)	=	123
Wednesday	100	Wednesday	2	(100 x 2/365 x 15%)	=	82
Thursday	100	Friday	0			0
Friday	100	Friday	0			0
	<u>600</u>					<u>451</u>

Weekly saving of the new policy is (RWF451 - RWF200) = RWF251

Annual saving is RWF251 x 52 = RWF13,052.

**The new proposal should be adopted.**

### **Centralised Cash Management**

If an organisation has decentralised operations e.g. multiple branches, there may be advantages in centralising cash management at Head Office. These are:

- **Economies of Scale** - by avoiding duplication of skills among divisions.
- **Expertise** - specialist staff employed at Head Office.
- **Higher Yield** - increased funds available may provide a greater return and reduce transaction charges. Likewise, borrowings can be arranged in bulk at keener interest rates than for smaller amounts.
- **Planning** - a cash surplus in one division may be used to offset a deficit in another, without recourse to short-term borrowings.
- **Bank Charges** - should be lower as the carrying of both balances and overdrafts should be eliminated.
- **Foreign Currency Risk** - can be managed more effectively as the organisation's total exposure situation can be gauged.

Some disadvantages are:

- Slower decision making
- Loss of local market knowledge
- Demotivation of local staff

### **Computerised Cash Management**

This allows companies via a computer terminal to get up-to-date information on cleared balances on their bank accounts. Three basic services are provided:

**Account Balances** - information provided on all accounts within a group (domestic and foreign). Details of un-cleared items which will clear the next day, forecast balances and individual transactions are available.

**Decision Support** - current money market and foreign exchange rates provided.

**Funds Transfer** - some services offer a direct link to brokers/banks, permitting instant deals to be made.

The service facilitates more efficient cash management as available cash balances are identified and utilised to the maximum. Thus, overall cash flow planning is more accurate. To obtain the full benefit cash management should be centralised. However, potential benefits must be compared with the additional costs incurred.

### **Cash Management Models**

A number of cash management models have been developed to determine the optimum amount of cash that a company should hold. One approach is to use the **Economic Order Quantity (EOQ) Model**, which is used in stock management (see Stock Management section later). Another (and more sophisticated) approach is the **Miller-Orr Model**. This determines a lower limit, an upper limit and a normal level on cash balances. If cash reaches the lower limit the firm sells securities to bring the balance back to the normal level. On the other hand, if the cash balance reaches the upper limit the firm should buy sufficient securities to return to the normal level. The various limits are set by reference to the variance of cash flows, transaction costs and interest rates.

### **Investment of Short-Term Funds**

In deciding the best approach consideration must be given to the quantity of funds; length of time for which available; certainty of the funds; rate of return; risk and variability of return; possibility and costs of early termination (liquidity).

Possible investments are:

- **Short-Term Deposits** - return depends on the period and amount.
- **Certificates of Deposit (CD's)** - flexible as CD's are negotiable.
- **Treasury Bills** - known, fixed return if held to maturity. Early disposal may result in capital gain/loss.
- **Reduction in Overdraft**



## C. THE MANAGEMENT OF DEBTORS

Excessive debt balances are a wasted resource which should be avoided by careful management. Good Management means reducing it to the practical minimum, consistent with not damaging the business. For example, it is no good simply refusing to give customers credit - they will go elsewhere. A balanced approach is required which will reduce debtors to a minimum acceptable level.

Debtors are often one of the largest items in a company's Balance Sheet and also one of the most unreliable assets, largely because company policies concerning them are often inadequate or poorly defined and in the hands of untrained staff. Typically, a company could have 20% - 25% of total assets as debtors.

Credit management is a problem of balancing profitability and liquidity. Extended Credit terms can be a sales attraction but higher debtors put a strain on liquidity. Management of debtors will be concerned with achieving the optimum level of investment. This requires finding the correct balance between:

- Extending credit to increase sales and, therefore profits and
- The cost of investment in debtors (cost of finance, administration, bad debts etc.)

By setting the "terms of sale" the company can, to some extent, control the level of debtors. However, the relative strengths of the credit-giver and the credit-taker are important. Consideration must also be given to the industry norm.

The company has at least four factors to control debtors:

1. The **customers** to which it is prepared to sell.
2. The **terms of credit** offered.
3. Whether **cash discounts** will be offered?
4. The **follow-up** procedures for slow payment.

### Evaluating Credit Risk

Before extending credit to new customers management will assess the risk of default in payment/non-payment. This will be based upon experience and judgement but in addition, the following sources may be used:

- **Trade References** - from other suppliers (at least two).
- **Bank References** - may be of limited use as banks are reluctant to supply adverse references.
- **Credit Agency Reports** - specialist agencies (e.g. Dun & Bradstreet) will provide detailed reports on the history, creditworthiness, business etc. of individuals and organisations on payment of a fee.
- **Published Information** - annual accounts etc.

- **Own Salesmen** - useful source but views may not be objective (commission receivable?).
- **Newspapers and Trade Journals.**
- **Other Credit Controllers** - many trade associations where controllers meet regularly to exchange information about the state of the industry generally and slow/bad payers in particular.
- **Own Information** - check old customer files to see if you have ever done business in the past.
- **Trial Period** - on a "cash -only" basis.
- **Credit Limit** - fix at low level initially and only increase if payment record warrants.
- **Site Visits** - an opinion on the operations can be formed by visiting the premises.
- **Credit Scoring** - evaluate potential customer using credit scoring or other quantitative techniques. Credit scores are risk indicators - the higher the score, the lower the risk. Scores will be allocated based on the characteristics of the new customer (e.g. age, occupation, length of service, married/single, home owner, size of family, income, commitments etc.). Credit scoring is particularly suited to financial institutions and the amount of credit offered, if any, will depend on whether the credit score is above a predetermined cut-off level. Computerised systems ("expert systems") are especially useful for this purpose.

Although terms and settlement discounts are often influenced by custom and practice within an industry it is still possible to change them. Once defined, ensure that the customers are aware of them - ideally, they should be informed when they order, when they are invoiced and when they receive statements. Always try to enforce the specified discount policy.

### **Discounts**

As extended credit facilities may be expensive to finance the firm may offer customers a discount (cash/settlement discount) to encourage them to pay early. As with extended credit discounts may also be used as a marketing tool in an effort to increase sales. To evaluate whether it is financially worthwhile the cost of the discount should be compared with the benefit of the reduced investment in debtors.

### **Example**

A company offers its customers 40 days credit. On average they take 60 days to pay. To encourage early payment the company now proposes to offer a 2 % discount for payment within 10 days.

For each RWF100 of sales the cost is RWF2 and the company only receives a net RWF98. In return the company receives payment 50 days earlier (day 60 - day 10). The annualised cost of the discount is:

$$\frac{2}{98} \times \frac{365}{50} = \mathbf{14.9\% \text{ p.a.}}$$

The cost of 14.9% should be compared with other sources of finance. If, for example, the cost of the company's overdraft is 16% p.a. the discount would seem to be worthwhile. If, on the other hand, the cost of the overdraft is only 10% p.a. the discount should **not** be offered as it would be better to leave the debts outstanding and finance through the overdraft.

In industries that deal with both trade and retail customers (e.g. building supplies) it is usual to offer **trade** discounts. This may reflect the economies of scale which derive from larger orders and the greater bargaining power of the customer. Trade discounts are frequently much larger than cash/settlement discounts and may be for as much as 25% of the quoted price.

### **Debt Control**

Good debt control can be summed up as *ensuring that all sales are paid for within an agreed period, without alienating customers, at the minimum cost to the company.*

The company itself can take steps to "assist" the debtors to pay promptly:

1. Issue invoices and statements promptly.
2. Deal with customer queries/disputes immediately.
3. Issue credit notes as agreed.
4. Be flexible in billing arrangements to accommodate customers.

There is no one debt collection policy that is applicable to all companies. Policies will differ according to the nature of the product and the degree of competition. Debt control **system** will probably include:

1. Well trained credit personnel.
2. Measures to ensure that credit limits are not exceeded.
3. Formal set procedures for collecting overdue debts, which should be known by all staff and applied according to an agreed time schedule. Care must be taken that the cost of the debt collection does not exceed the amount of the debt, except where used as a deterrent. Also over-zealous collection techniques may damage goodwill and lose future sales.
4. Computerised monitoring systems to identify overdue accounts as early as possible. For example, ratios, compared with the previous period to highlight trends in credit levels and the incidence of overdue and bad debts; statistical data to identify causes of default and the incidence of bad debts among different classes of customer and types of trade. An "**Aged Analysis of Debtors**" is particularly useful in this regard.

<b>Debtor</b>	<b>Total</b>	<b>Current</b>	<b>1-2 Months</b>	<b>2-3 Months</b>	<b>&gt;3 Months</b>
A	RWF10,000	RWF5,000	RWF5,000		
B	RWF20,000	RWF10,000		RWF5,000	RWF5,000
C	RWF50,000			RWF30,000	RWF20,000
D	RWF50,000	RWF10,000		RWF20,000	RWF20,000
E	RWF60,000	RWF30,000	RWF20,000		RWF10,000
F	RWF40,000	RWF10,000	RWF20,000		RWF10,000
G	RWF30,000	RWF10,000		RWF20,000	
H	RWF50,000	RWF20,000	RWF20,000	RWF10,000	
<b>Total</b>	<u>RWF310,000</u>	<u>RWF95,000</u>	<u>RWF65,000</u>	<u>RWF85,000</u>	<u>RWF65,000</u>
<b>%</b>		<b>31%</b>	<b>21%</b>	<b>27%</b>	<b>21%</b>

Debt collection policies must not be regarded as completely inflexible and systems should be modified as circumstances change.

Among the many debt collection techniques that can be used are:

1. **Invoices** - issued promptly following delivery of goods/service.
2. **Statements** - at monthly/other intervals to draw attention to unpaid debts.
3. **Overdue Letters** - carefully drafted to provoke an immediate response; individual rather than computer-produced; series of letters of varying degrees of severity.
4. **Telephone Calls** – these ensure that customer has received the letter(s) and gives him an opportunity to raise any queries or advise of any difficulties which may cause a change of approach to help him out.
5. **Mail or Email Reminders.**
6. **Visits by Sales Staff.**
7. **Visits by Credit Control Staff.**
8. **Use of External Agencies** - debt collection agency; factoring company etc.
9. **Threaten Withdrawal of Credit Facilities/Discounts.**
10. **Threaten To Withhold Future Supplies.**
11. **Lawyer’s Letter.**
12. **Legal Action** - beware cost of action does not exceed debt.

In most cases some extra spending on debt collection will reduce the overall cost of the investment in debtors (e.g. reduction in bad debts/average collection period etc.). However, beyond a certain level extra spending is not usually cost effective.

## **Credit Policy**

### **Example 1**

Current sales are RWF500,000 p.a. - all on credit. On average customers take 60 days credit. Bad debts are 1% of sales.

Marketing manager suggests that if credit is relaxed to 90 days sales will increase by 20%. However, bad debts will increase to 2%. It is estimated that 75% of existing customers will take the 90 days. Variable costs are 90% of sales value and the company uses an overdraft costing 10% p.a.

Should the new proposal be adopted?

Increased Sales (20%)			<u>100,000</u>
Increased Contribution (10%)			10,000
Bad Debts - Existing	500,000 x 1%	5,000	
- Revised	600,000 x 2%	<u>12,000</u>	
			(7,000)
Debtors - Existing	500,000 x 60/365	<u>82,192</u>	
- New	500,000 x 75% x 90/365	92,466	
	500,000 x 25% x 60/365	20,548	
	100,000 x 90/365	<u>24,658</u>	
		<u>137,672</u>	
Increase in Debtors		55,480	
Cost of Increased Debtors @ 10% p.a.			<u>(5,548)</u>
Net Cost			<u>(2,548)</u>

The New Policy is **Not** Worthwhile

### Example 2

Current sales are RWF500,000 p.a. - all on credit. 60 days credit allowed but on average 90 days taken.

New credit terms of a 4% discount for payment by day 10 are being considered. It is estimated that 60% of the customers will take the discount. The new terms will increase sales by 20%. Variable costs are 85% of sales value and the company uses an overdraft costing 11% per annum. Should the discount be offered?

Increased Sales (20%)			<u>100,000</u>
Increased Contribution (15%)			15,000
Cost of Discount	600,000 x 60% x 4%		(14,400)
Debtors - Existing	500,000 x 90/365	123,287	
- New	600,000 x 60% x 10/365	9,863	
	600,000 x 40% x 90/365	<u>59,178</u>	
		<u>69,041</u>	
Reduction in Debtors		<u>54,246</u>	
Saving due to Reduced Debtors @ 11% p.a.			<u>5,967</u>
Net <b>Benefit</b>			<u>6,567</u>

The New Policy **Is** Worthwhile.

## **Factoring**

This involves the sale of trade debts for immediate cash to a “factor” who charges commission. Factoring companies are financial institutions often linked with banks. Unlike an overdraft the level of funding is dependent, not upon the fixed assets of the company, but on its success, for as the company grows and sales increase the facility offered by the factor grows, secured against the outstanding invoices due to the company. Three basic services are offered, although a company need not use all of them:

1. **Finance** - instruction on invoices that payment is to be made to the factor, who is responsible for collection of the debt. When the factor receives the invoices 80% approx. of value is advanced. The balance (less charges, including interest) is paid, either when the invoice is settled or after a specified period.
2. **Sales Ledger Management** - the factor takes the place of the client’s accounts department. Duplicate invoices are sent to the factor who maintains a full sales ledger for each client, handles invoices, chases outstanding payments etc. Commission of 1% - 2% is usually charged.
3. **Credit Insurance** - in return for a commission the factor provides a guarantee against bad debts.

Recourse Factoring - the factor will reclaim the money advanced on any uncollected debt so the business will retain the risk of non-recovery and, depending on the contract terms, perhaps the administration burden as well.

Non-Recourse (Full) Factoring - the factor runs credit checks on the company’s customers and agrees limits dependent on their creditworthiness. These can be adjusted in the light of experience, once a pattern has been established. The factor will protect the client against bad debts on **approved** sales and will also take on all the administration burden. The balance over the 80% advance is paid to the client an agreed number of days after the initial advance.

Recourse v Non-Recourse Factoring - with non-recourse factoring the business knows that it will get paid, no matter what happens but protection only applies to **credit-approved** debts and it is not always easy to get this approval for doubtful ones. Recourse factoring allows more funding to be made available against less credit-worthy debtors and the business is in control of when and how individual debts are to be pursued and collected.

The cost of finance through factoring is usually slightly above overdraft rates. The administration charges vary between 0.6% and 2.5% approx.

## **Advantages of Factoring**

1. It is an alternative source of finance if other sources are fully utilised, particularly for a company with a high level of debtors.
2. It is especially useful for growth companies where debtors are rising rapidly and funds available from the factor will rise in tandem.

3. Security for the finance is the company's debtors, leaving other assets free for alternative forms of debt finance.
4. The factor may be able to manage the company's sales ledger more efficiently by employing specialist staff, leading to lower costs for the company and freeing management to concentrate on growing the business.
5. Bad debts will be reduced or guaranteed by credit insurance.
6. Due to the greater guarantee of cash flow the company will have a better opportunity for taking up cash discounts from suppliers.
7. The factor will be more efficient in collecting monies. Evidence in Europe suggests that, on average, it takes over 75 days for an invoice to be paid, whereas the average debt turn of companies using factoring is 60 days.
8. The company replaces a great many debtors with one - the factor - who is a prompt payer.

### **Disadvantages of Factoring**

1. It may be more expensive than other sources.
2. When fixing credit terms and limits the factor will be concerned with minimising risk and, therefore, certain risky but potentially profitable business may be rejected.
3. The factor may be "pushy" when collecting debts. This may lead to ill-feeling by customers.
4. Use of a factor might reflect adversely on a company's financial stability in the eyes of some ill-informed people. Factoring is more acceptable nowadays but this problem could be overcome by undisclosed factoring, which leaves the company to collect payment as agent for the factor.

### **Invoice Discounting**

This is similar to factoring but only the finance service is used. Invoices are discounted (like Bills Receivable) and immediate payment, less a charge, is received. The company still collects the debt as agent for the financial institution and is also liable for bad debts. The service tends to be used on an ad hoc basis and is provided by factors for clients who need finance but not the administrative service or protection. Invoice Discounting is confidential and solely a matter between the lender and borrower, unlike Factoring where the bank assumes a direct and visible role between the company and its debtors. Also, the company retains full control over the management of its debtor's ledger, including credit control.

## D. THE MANAGEMENT OF CREDITORS

Trade credit is often used as a source of finance. The costs of this source of finance are the costs of any discounts forgone and any interest charges which the creditor charges on overdue bills. Of course, excessive use of this source may lead to poor relations with a supplier (or even no relations) which can be damaging.

Credit from suppliers is a very important source of short-term finance.

The credit is mistakenly believed to be cost-free. The costs include the following:

1. **Loss of Supplier's Goodwill** - this is difficult to quantify. If the credit period is regularly overdone suppliers may put a low priority on the quality of service given; further orders may be refused; cash on delivery or payment in advance demanded.
2. **Higher Unit Costs** - the supplier may try to recoup the cost of longer credit by charging increased prices.
3. **Loss of Cash Discounts** - if the credit period is used then discounts are not being taken. Thus, the cost of credit is the cost of **not** taking the discount.

### Example

Your company normally pays within 45 days. The supplier offers a 2% discount for payment within 10 days. If the company refuses the discount the implied cost of not taking the discount is:

$$\frac{2}{98} \times \frac{365}{35} = 21.3\% \text{ p.a.}$$

The cost of **not** taking the discount (opportunity cost) is 21.3% p.a.

Despite the above costs trade credit is the largest source of short-term funds for companies. Among the advantages are:

1. Obtaining credit is **informal**.
2. It is a **flexible** source of finance - but payment should not be delayed regularly.
3. It is a relatively **stable** source of finance - it is available continuously.
4. **No security** is required - unlike other forms of credit.



## E. THE MANAGEMENT OF STOCKS

In many organisations stock requires the commitment of a large amount of resources. The classic conflict often arises:

The **Production** manager desires a large stock of **raw materials** so that production is uninterrupted.

The **Sales** manager desires a large stock of **finished goods** so that no sales are lost.

The **Finance** manager desires a **low** level of **all types** of stock so that costs are minimised.

### Ordering and Holding Costs

High levels of stock can only be achieved at a cost. The total cost of stock-holding has many elements:

- Cost of financing
- Storage (warehousing)
- Handling
- Insurance
- Administration
- Obsolescence
- Deterioration
- Pilferage

Sound stock control entails *having the right product available in the right quantity, at the right time and at the right cost.*

Fast and frequent replenishment of sales will minimise stock-holding.

Overall, reducing stock is likely to increase profitability rather than decrease it. Reducing stock is almost totally within the control of management - unlike reducing debtors or increasing creditors, it does not rely on the co-operation of third parties.

### Economic Order Quantity (EOQ)

Total stock-holding costs could be broadly classified as “Holding” costs and “Ordering” costs. The EOQ model attempts to **minimise** total costs by balancing between holding and ordering costs. If large batches are ordered this will result in high holding costs and low ordering costs. Conversely, if small batches are ordered this will result in low holding costs and high ordering costs.

$$EOQ = \sqrt{\frac{2 cd}{h}}$$

where: c = cost per order

d = annual demand for item of stock

h = annual cost of holding a unit in stock

The EOQ Model makes a number of **assumptions**:

- Order cost is constant regardless of the size of the order.
- Use of the item of stock is constant.
- No stock-outs occur.
- Purchase price is constant.

**Example:**

A company has annual demand for 2,000 units. Each unit can be purchased for RWF20. The cost of placing each order is RWF20 and the annual cost of holding an item in stock is RWF2. Calculate the Economic Order Quantity.

$$EOQ = \sqrt{\frac{2 \times 20 \times 2,000}{2}} = 200 \text{ units}$$

**Discounts**

If the supplier offers a discount for larger orders this may alter the position. The discount will offer two savings - a reduced purchase price and lower ordering costs because fewer orders are placed. Using the above example, suppose that a discount of 2% is offered on orders of 400 or more.

Calculate the total costs with and without the discount. Total costs will now consist of ordering costs + holding costs + purchase price.

200 units

Ordering:	RWF20 x $\frac{2,000}{200}$	RWF200
Holding:	RWF2 x $\frac{200}{2}$	RWF200
Purchase:	2,000 x RWF20	<u>RWF40,000</u>
		<u>RWF40,400</u>

400 units

Ordering:	RWF20 x $\frac{2,000}{400}$	RWF100
Holding:	RWF2 x $\frac{400}{2}$	RWF400
Purchase:	2,000 x RWF19.60	<u>RWF39,200</u> <u>RWF39,700</u>

**THE DISCOUNT IS WORTHWHILE**

**Just In Time Stock Management (JIT)**

The main purpose of JIT purchasing is to ensure that delivery of supplies occurs immediately prior to the requirement to use them in manufacture, assembly or resale. Close co-operation between user and supplier is essential. The supplier is required to guarantee product quality and reliability of delivery while the user offers the assurance of firmer long-term sales. Users will purchase from fewer and perhaps, only a single supplier, thus enabling the latter to achieve greater scale economies and efficiency in production planning. The user expects to achieve savings in materials handling, inventory investment and store-keeping costs since (ideally) supplies will now move directly from unloading bay to the production line. There may also be benefits from bulk purchasing discounts or lower purchase costs.

With a JIT system there is little room for manoeuvre in the event of unforeseen delays – e.g. on delivery times. The buyer is also dependent on the supplier for the quality of materials, as expensive downtime or a production standstill may arise, although guarantees and penalties may be included in the contract as protection.

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## **Study Unit 9**

### **Capital Markets**

#### **Contents**

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##### **A. Introduction**

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##### **B. Main Functions of Capital Markets**

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##### **C. Capital Providers**

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##### **D. Company Flotation**

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##### **E. Efficient Markets**

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## **A. INTRODUCTION**

Capital Markets are markets where **long-term** instruments are traded e.g. equities, preference shares, debentures etc.

A good example of a Capital Market is the Stock Exchange.

**The Rwanda Stock Exchange** was incorporated as a limited company 7 October 2005

## **B. MAIN FUNCTIONS**

The main functions of the Stock Exchange are:

PRIMARY MARKET - used to raise new finance/issue new securities

SECONDARY MARKET - trade in second-hand securities. This is where most of the day-to-day activity takes place.

COMPANY FLOTATION

SHARE SWAP - securities used as consideration in takeover of other companies

## **C. CAPITAL PROVIDERS**

The main providers of capital are:

- Pension Funds
- Insurance Companies
- Investment Trusts
- Unit Trusts
- Other Financial Institutions
- Overseas Investors
- Venture Capital Organisations
- Individuals

## **D. COMPANY FLOTATION**

There are many reasons why a company may be floated on the Stock Market (“Going Public”). Chief among these is access to capital.

### **1. ADVANTAGES - SHAREHOLDERS**

1. Cash for some shares.
2. Wider market for remaining shares.
3. Shares perceived as less risky.
4. Ready share price available.

### **2. ADVANTAGES - COMPANY**

1. Possibility of new funds.
2. Better credit-standing.
3. Ability to “swap shares” on a takeover.
4. Ability to issue shares more easily at a later date.
5. Reduced risk & greater marketability leads to lower cost of capital.
6. Extra status.
7. Possibility of share options for top employees.

### **3. DISADVANTAGES**

1. Costs can be quite high.
2. Compliance with stringent regulations.
3. Dilution of control.
4. Additional administration.
5. Extra scrutiny of profitability/performance.

## **E. EFFICIENT MARKETS**

A market is generally regarded as efficient if the following are present:

Prices immediately reflect all relevant available information

No individual investor dominates the market

Transaction costs are not too high to discourage trading

Are the markets efficient? The Efficient Market Hypothesis (EMH) has been developed to test different levels of efficiency. [Note: Hypothesis is defined as a supposition put forward as a basis for reasoning or investigation.]

The Efficient Market Hypothesis tests three degrees of efficiency

**1. Weak Form Efficiency**

Prices reflect the information in past stock prices.

**2. Semi-strong Form Efficiency**

Prices reflect past price information

Plus

All publicly available information.

**3. Strong Form Efficiency**

Prices reflect past price information

Plus

All publicly available information

Plus

Inside information

Most of the research suggests that capital markets are semi-strong-form efficient but not quite strong-form efficient.



## **Study Unit 10**

### **Long-Term Sources of Finance**

#### **Contents**

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##### **A. Introduction**

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##### **B. Share Capital**

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##### **C. Loan Capital**

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##### **D. Warrants**

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##### **E. Methods of Share Issues**

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##### **F. Bank Lending**

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## A. INTRODUCTION

This can be effected best by way of an example:

RWF'000	Average	Poor	Excellent
Profits	100	20	300
(i) Interest (200 x 10%)	20	20	20
	<hr/> 80	<hr/> 0	<hr/> 280
Corporation Tax (20%)	16	0	56
Profits After Tax	<hr/> 64	<hr/> 0	<hr/> 224
(ii) Preference Dividend	10	0	10
(iii) Available for Equity	<hr/> 54	<hr/> 0	<hr/> 214

### Note:

Comparing the Average with the Excellent performance it should be noted that while Profits increase by **200%**, the amount Available [at number (iii)] to Equity increases by almost **300%**.

No matter what the level of performance, a fixed amount is paid to the Lenders and the Preference Shareholders.

Interest on borrowings is allowable for Corporation Tax.

Note the ranking of the different providers of capital.

The Ordinary Shareholders (equity) are entitled to the “residue” after all others have been rewarded.

## B. SHARE CAPITAL

### Ordinary Shares

The main features are:

- Issued to the owners of the company (equity).
- Nominal or “face” value (e.g. 1000rwf.).
- Market value moves with market’s view of the company’s performance/prospects.
- Shareholders are not liable for the company’s debts on a winding-up (limited liability).
- Carry voting rights
- Ordinary shareholders are entitled to the residue after other parties are rewarded. This applies to both annual profits and capital on a winding-up.
- Subscription privileges apply in the event of a new issue of shares (“pre-emptive rights”).
- Shareholders may be rewarded by dividends (income), or retained profits (capital gain). Some companies offer concessions on their products to shareholders - e.g. discounts or vouchers.

- Some companies have different classes of ordinary shares. For example, **Non-Voting** similar to other shares in every respect, except holders cannot vote.

### **Advantages to the Company**

- No fixed annual charges are payable - no legal obligation to pay a dividend.
- Do not have a maturity date and are not normally redeemable.
- Usually more attractive to investors than fixed interest securities.
- Might increase the creditworthiness of a company as they reduce gearing.

### **Disadvantages to the Company**

- Issue might reduce EPS, especially if the assets acquired do not produce immediate earnings.
- Extend voting rights to more shareholders.
- Lower gearing as a result of the issue might result in a higher overall cost of capital than is necessary.
- Issues often involve substantial issue and underwriting costs.
- Dividends are not a tax allowable expense.

### **Preference Shares**

The main features are:

- Holders are entitled to a fixed maximum dividend.
- Dividends are only paid if sufficient profits are available.
- Rank prior to ordinary shares (both dividends and capital on a winding-up).
- Cumulative Preference Shares the right to any arrears of dividend carried forward and they must be paid before any dividend is paid to the ordinary shareholders. Preference Shares are cumulative, unless expressly stated to be non-cumulative.
- Restricted voting rights - usually only available in a situation where the rights attaching to the shares are being amended or if dividends are in arrears.
- Some companies have different classes of preference shares. For example,
  - Redeemable** - generally redeemable subject to sufficient profits being available or sufficient cash being raised from a new issue.
  - Convertible** - the right to convert to ordinary shares as per the terms of the issue.

### **Advantages to the Company**

- A fixed percentage dividend per year is payable no matter how well the company performs, but only at the discretion of the company's directors.
- Do not normally give full voting rights to holders.
- Preference shares are mostly irredeemable.

### **Disadvantages to the Company**

- Cumulative arrears of dividend are payable.
- Dividends are not a tax allowable expense.

### **C. LOAN CAPITAL**

The main types are Loan Stock and Debentures.

- **Loan Stock** - long-term debt (usually > 10 years duration) on which a fixed rate of interest (coupon rate) is paid. Generally unsecured.
- **Debentures** - a form of loan stock, legally defined as a written acknowledgement of debt. Usually secured. Trustees appointed to look after investors' interests. Can be redeemable or irredeemable.
- Loan capital ranks prior to share capital (both interest and capital on a winding-up). The ranking of individual debt will depend upon the specific conditions of each issue.
- Restrictive covenants are often included in the lending agreement (e.g. restrictions on further borrowings, the payment of dividends, or major changes in operations; the maintenance of certain key ratios in the accounts etc.).
- If security is provided the cost to the company may be cheaper. Security may be in the form of a fixed or floating charge.
- Interest payments are allowable for Corporation Tax.
- If the net cost of debt is low why do companies not borrow more and more? Some of the reasons are:
  - A high level of debt will increase the financial risk for the shareholders.
  - Interest charges at a particular point in time may be high.
  - The company may have insufficient security for new debt.
  - There may be restrictions on further debt - Articles of Association; restrictive covenants; credit lines fully used etc.

### **Redemption of Loan Capital**

- Most redeemable stocks have an earliest and a latest date for redemption.
- Redemption is at the company's option anytime between these two dates.
- When should the company redeem? Generally, if the coupon rate is below current interest rates delay to the later date and vice versa. However, the following factors should be considered:
  - If internally generated funds are to be used, consider their availability.
  - If a further issue of debt is to be used, consider issue costs.

- The trend in future interest rates.
- If new equity is to be used, shares should be issued when the price is relatively high.

### **Convertible Loan Stock**

This is debt paying a fixed rate of interest but also providing the option to convert to equity at a pre-determined rate on pre-determined date(s).

The main features are:

- Conversion is at the option of the holder.
- Conversion terms usually vary over time.
- Once stock is converted it cannot be converted back.

### **Advantages to the Company**

- It is cheaper than straight debt due to the conversion rights. The lower coupon rate may suit projects with low cash flows in the early years.
- A high-risk company may have difficulty raising long-term finance no matter what coupon rate is offered. Convertibles may attract investors due to the “upside potential”.
- If conversion takes place, the debt is self-liquidating. Conversion will reduce gearing and enable further debt to be raised in the future.
- Interest payments are tax deductible.
- Convertibles are often not secured and have less restrictive covenants than straight debentures.
- The number of shares eventually issued on conversion will be smaller than if straight equity is issued.

### **Advantages to the Investor**

- If the market value of the company’s shares falls the value of the convertibles will not fall below the market value of straight debt with the same coupon.
- If the market value of the company’s shares rises the value of the convertibles will rise also.
- Convertibles rank before shares on a winding-up.
- If the company’s fortunes improve dramatically investors can share in this by exercising their option.

### **Floating Rate Bonds**

- These are debt securities whose interest is **not fixed** but is re-fixed periodically by reference to some independent interest rate index - e.g. a fixed margin over National Bank of Rwanda Interbank Rate. These are commonly referred to as Floating Rate Notes or FRNs. Coupons are re-fixed, and coupon payments made, usually every six months.

- When market interest rates **fall** the issuer (borrower) is not saddled with high fixed coupon payments. Likewise, when interest rates **rise** the investor is not stuck with a fixed income but will see his income rise in line with market rates.
- The market value of such securities should be fairly stable as interest rates will rise/fall in line with market interest rates.

### **Deep Discount Bonds**

These are debt securities which are issued at a large discount to their nominal value but will generally be redeemable at par on maturity. To compensate for the fact that a large capital gain accrues on maturity, the ongoing coupon rate is substantially lower than other types of loan stock. An example might be:

**2% Bond 2015, which was issued in 2005 at a price of RWF70 per cent.**

- The price of the bond in the secondary market will gradually appreciate as the maturity date approaches.
- Many projects require funding up-front, but are unlikely to give rise to an income stream to service interest costs for some period of time - e.g. a building project where income from rentals or sale of the building would be received much later. A Deep Discount Bond can be a useful source of funding for such a project as it helps to match cash flows.
- An attraction to the investor is the advantageous taxation treatment in certain countries - e.g. the capital gain at maturity is subject to CGT, which may be at a lower rate than income tax, or the gain is taxed as income in one lump sum on maturity or sale rather than as interest each year.

### **Zero Coupon Bonds**

Zero Coupon Bonds are very similar to Deep Discount Bonds except that **no interest** is paid during the life of the bond and are, therefore, issued at a large discount to their nominal value. An example might be:

**0% Bond 2020, which was issued in 2010 at a price of RWF50 per cent.**

Instead of interest payments the investor receives as a return the difference between the issue price and the higher redemption proceeds.

## D. WARRANTS

- Holder has the right (but not the obligation) to purchase a stated number of shares, at a **specified** price, anytime before a specified date.
- If not exercised the warrants lapse.
- Warrants are often issued as a “sweetener” to make a loan stock issue more attractive, or to enable the company to pay a lower coupon rate.
- The warrant-holder is **not** entitled to dividends/voting rights.
- Unlike convertibles, new funds are generated for the company if the warrants are exercised.
- Generally, the warrant is detachable from the stock and can be traded separately.
- The value of the warrant is dependent on the underlying share price.

## E. METHODS OF SHARE ISSUE

### Offer For Sale

- Public at Large
- Fixed Price

### Offer For Sale By Tender

- Public at Large
- Not a Fixed Price
- Set a Minimum Price & Invite Tenders
- Shares Issued at Highest Price where All Taken-up

### Placing

Shares "Placed" with Target Audience – generally institutions

### Rights Issue

Shares Issued to Existing Shareholders

Pro-rata to Existing Shareholding (e.g. One for Five Issue)

**Example:**

One for Five Issue

<b>Company</b>	<b>Shareholder</b>
10m shares	1m shares (10% holding)
<u>2m new shares</u>	<u>0.2m new shares</u>
<u>12m</u>	<u>1.2m (10% holding)</u>

**Possible Choices**

- Subscribe for new shares (exercise rights)
- Sell "rights" to new shares
- Exercise rights (part) & sell rights (part)
- Do nothing

**Example:**

Shares currently trading at RWF2.00 (cum rights). Rights issue on a one-for-four basis at a price of RWF1.50. Examine the consequences for a shareholder who currently owns 1,000 shares.

Firstly, calculate the "*Theoretical Ex-Rights Price*"

4 shares	@ RWF2.00	=	RWF8.00
<u>1 share</u>	<u>@ RWF1.50</u>	=	<u>RWF1.50</u>
<u>5 shares</u>			<u>RWF9.50</u>



**Theoretical Ex-Rights Price = RWF9.50/5 = RWF1.90**

Secondly, calculate the **Value of The Rights**

Ex-Rights Price	RWF1.90
Issue Price	<u>RWF1.50</u>
Value of Rights	<u><u>RWF0.40</u></u>

(i) <u>Exercise Rights</u>	
Value of Shares (1,000 + 250) @ RWF1.90	RWF2,375.00
Less Cost of Purchase (250 @ RWF1.50)	<u>(RWF375.00)</u>
	<u><u>RWF2,000.00</u></u>
Current Wealth (1,000 @ RWF2.00)	RWF2,000.00
(ii) <u>Sell Rights</u>	
Sale of Rights (250 @ RWF0.40)	RWF100.00
Value of Shares (1,000 @ RWF1.90)	<u>RWF1,900.00</u>
	<u><u>RWF2,000.00</u></u>
Current Wealth (1,000 @ RWF2.00)	RWF2,000.00
(iii) <u>Exercise Half &amp; Sell Half</u>	
Sale of Rights (125 @ RWF0.40)	RWF50.00
Value of Shares (1,000 + 125 @ RWF1.90)	RWF2,137.50
Less Cost of Purchase (125 @ RWF1.50)	<u>(RWF187.50)</u>
	<u><u>RWF2,000.00</u></u>
Current Wealth (1,000 @ RWF2.00)	RWF2,000.00
(iv) <u>Do Nothing</u>	
Value of Shares (1,000 @ RWF1.90)	RWF1,900.00
Current Wealth (1,000 @ RWF2.00)	<u>RWF2,000.00</u>
Loss of Wealth	<u><u>(RWF100.00)</u></u>

## **F. BANK LENDING**

The main considerations by the bank before advancing a loan can be summarized by the mnemonic PARTS.

**P** URPOSE

**A** MOUNT

**R** EPAYMENT

**T** ERM

**S** ECURITY

# **Study Unit 11**

## **Venture Capital**

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**A. Introduction**

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**B. Stages of Investment**

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**C. Specialist Areas**

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**D. Business Plan**

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**E. Methods of Withdrawal by Venture Capitalist**

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## A. INTRODUCTION

Many new business ventures are considered too risky for traditional bank lending (term loans, overdrafts etc.) and it is this gap that Venture Capital usually fills.

Venture Capital could be described as a means of financing the start-up, expansion or purchase of a company, whereby the venture capitalist acquires an agreed proportion of the share capital (equity) of the company in return for providing the requisite funding. To look after its interests the venture capitalist will usually want to have a representative appointed to the board of the company.

The venture capitalist's financing is not secured – he takes the risk of failure just like other shareholders. Thus, there is a high risk in providing capital in these circumstances and the possibility of losing the entire investment is much greater than with other forms of lending. The venture capitalist also participates in the success of the company by selling his investment and realising a capital gain, or by the company achieving a flotation on the Stock Market in usually five to seven years from making his investment. As a result, it will generally take a long time before a return is received from the investment but to compensate there is the prospect of a substantial return.

Venture Capital has grown in popularity – for instance in the UK in 1979 venture capital investments amounted to GBP20m., whereas this had grown to GBP1,000m. by 1991.

## B. STAGES OF INVESTMENT

The various stages of investment by a venture capitalist can be defined as follows:

- **Seed Capital** – finance provided to enable a business concept to be developed, perhaps involving production of prototypes and additional research, prior to bringing the product to market.
- **Start-Up** – finance for product development and initial marketing. Companies may be in the process of being set up or may have been in business for a short time but have not sold their product commercially.
- **Expansion** – capital provided for the growth of a company which is breaking even or possibly, trading profitably. Funds may be used to finance increased production capacity, market or product development and/or provide additional working capital. Capital for “turnaround” situations is also included in this category.
- **Management Buy Out (MBO)** – funds provided to enable **current** operating management and investors to acquire an existing business.
- **Management Buy In (MBI)** – funds provided to enable a manager or group of managers from **outside** the company to buy into the company.

## C. SPECIALIST AREAS

Venture Capitalists may specialise in areas in which they will invest. These may relate to:

- **Preferred Business Sectors** – e.g. consumer services, Information Technology, property etc.
- **Stage of Investment** – many venture capitalists will finance expansions, MBO's and MBI's but far fewer are interested in financing "Seed Capital," start-ups and other early stage companies, due to the additional risks and time/costs involved in refinancing smaller deals as compared with the benefits.
- **Regional Preferences** – the preferred geographical location of the investee.
- **Amount of Investment** – varies with the stage of the investment. Start-up and other early stage investments are usually lesser in amount than expansion and MBO/MBI investments. RWF

## D. BUSINESS PLAN

Before deciding whether an investment is worth backing the venture capitalist will expect to see a Business Plan. This should cover the following:

- **Product/Service** – what is unique about the business idea? What are the strengths compared to the competitors?
- **Management Team** – can the team run and grow a business successfully? What are their ages, relevant experience, qualifications, track record and motivation? How much is invested in the company by the management team? Are there any non-executive directors? Details of other key employees.
- **Industry** – what are the issues, concerns and risks affecting the business area?
- **Market Research** – do people want to buy the idea?
- **Operations** – how will the business work on a day-to-day basis?
- **Strategy** – medium and long-term strategic plans.
- **Financial Projections** – are the assumptions realistic (sales, costs, cash flow etc.)? Generally, a three year period should be covered. Alternative scenarios, using different economic assumptions. Also state how much finance is required, what it will be used for and how and when the venture capitalist can expect to recover his investment?
- **Executive Summary** – should be included at the beginning of the Business Plan. This is most important as it may well determine the amount of consideration the proposal will receive.

## **E. METHODS OF WITHDRAWAL BY VENTURE CAPITALIST**

The various means by which an investment may be withdrawn after a number of years include:

- The company is acquired by another company (probably through an arranged deal).
- A management buy out occurs and the venture capitalist's shares are purchased by the existing management team.
- A management buy in occurs.
- The investment is refinanced, possibly by another venture capitalist organisation.
- The company obtains a listing on a Stock Market.
- A minority equity stake is purchased in the company, possibly by a customer or other company in the same industry. This is sometimes referred to as "Corporate Venturing."
- The company is liquidated.

## **Study Unit 12**

### **Dividend Policy**

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##### **C. Scrip Dividends**

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##### **D. Share Repurchase (Share Buyback)**

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##### **E. Share Splits**

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## A. INTRODUCTION

### **Dividends** are paid from retained earnings

**Retained Earnings** – -One of the most important sources of “new” **equity** funds for companies. The more funds retained, the less available for the payment of dividends and vice versa.

**Prime Objective** – To maximise the wealth of the shareholders.

**Dilemma** – Pay dividends now or retain earnings for future capital gain.

## B. PRACTICAL CONSIDERATIONS

There are a number of practical considerations which a company must take into account in setting its particular dividend policy. Chief among these are:

- **Taxation** – Income Tax v Capital Gains Tax. If shareholders pay high marginal rates of Income Tax they may prefer low dividends. If subject to low tax rate or zero tax, they may prefer high dividends.
- **Investment Opportunities** – “*Residual Theory*” => retain sufficient funds until all profitable investments (those with a positive NPV) have been funded. Balance to be paid as dividends. Drawback is that dividends may vary dramatically from year to year. Also, consider the timing of the cash flows from the investments as these will be required to pay future dividends.
- **Availability of Finance** – If the company is highly geared it may have little option but to retain. Retentions will build up the equity base, thus reducing gearing and assisting future borrowing. Certain types of company (e.g. small/unquoted) may not have access to external funds and may need to retain.
- **Liquidity** – Profits do not equal cash. Adequate cash must be available to pay dividends. Also, for growth companies, sufficient liquidity must be available for reinvestment in fixed assets.
- **Cost of New Finance** – The costs associated with raising new equity/debt can be quite high. If debt is raised interest rates may be high at that particular point in time.
- **Transaction Costs** – Some shareholders may depend on dividends. If earnings are retained they can create “home-made” dividends by selling some shares (capital). However, this may be inconvenient and costly (brokerage fees etc.).
- **Control** – If high dividends are paid the company may subsequently require capital and this may be obtained by issuing shares to new shareholders. This may result in a dilution of control for existing shareholders.
- **Inflation** – In periods of high inflation companies may have to retain funds in order to maintain their existing operating capability. On the other hand, shareholders require increased dividends in order to maintain their purchasing power.



- **Information Content** – The declared dividend provides information to the market about the company’s current performance and expected future prospects. An increase or a reduction will be reflected in the share price.
- **Existing Debt** – Restrictive covenants in existing loan agreements may limit the dividend payout or prohibit the company from arranging further borrowing. Existing debt which may be due for repayment will require funds and may cause a reduction in the level of dividend.
- **Legal Restrictions** – Dividends can only be paid out of **realized** profits. Past losses must first be made good.
- **Perceived Risk** – The earnings from retained dividends may be perceived as being a more risky return than actual cash dividends, thereby causing their perceived value to be lower (the “Bird in the Hand Theory”).
- **Stable Dividends** – Generally, shareholders require a stable dividend policy and hopefully, steady dividend growth.

*Note:* Some companies adopt a constant payout ratio, whereby a fixed percentage of earnings is paid out as dividends. This has the drawback that dividends will rise and fall with earnings. However, this may not be a problem for a company which is not subject to cyclical factors and whose earnings grow steadily.

*Conclusion:* There is unlikely to be a single dividend policy which will maximize the wealth of all shareholders. The company should try to ascertain the composition of its shareholders in order to pursue a dividend policy which is acceptable. Maybe, the best is to adopt a consistent policy and hope to attract a “**clientele of shareholders**” to whom it appeals.

### C. SCRIP DIVIDENDS

A scrip dividend is where a company offers existing shareholders a choice of new shares in lieu of their cash dividend. This effectively converts reserves into issued share capital.

The advantage for the company is that it conserves cash and increases the capital base, thereby improving gearing. The shareholders can increase their holdings without incurring brokerage fees.

Some companies have offered enhanced scrip dividends, where the value of the shares offered is greater than the cash alternative. Thus the shareholder is enticed to choose the scrip dividends.

### D. SHARE REPURCHASE (“SHARE BUYBACK”)

Share repurchases are a way for companies to distribute earnings to shareholders other than by a cash dividend. They are also a means of altering a target capital structure; supporting the share price during periods of weakness; and deterring unwelcome take-over bids. Companies typically repurchase shares either by making a tender offer for a block of shares, or by buying the shares in the open market.

In the absence of taxation and transactions costs, share repurchase and the payment of dividends should have the same effect on share value. However, the different treatment of taxation on dividends and capital gains in many countries may lead to a preference for share repurchases by investors. If the repurchase of shares is by means of a tender offer, this will often be at a price in excess of the current market value, and may have a different effect on overall company value.

The use of share repurchases, and the payment of dividends, will be influenced by the amount of investment that the company undertakes. When a company does not have sufficient investments to fully utilise available cash flow, the payment of dividends or share repurchases are more likely. When a company buys back its shares it replaces equity with cheaper, tax-deductible debt and raises EPS by reducing the number of shares outstanding. The practice is most often used by companies with surplus cash not needed for further investment or to cut debt.

Analysts are believed normally to consider an increase in dividends or share repurchases as good news, as they suggest that the company has more cash, and possibly greater earnings potential, than previously believed. Buybacks are usually followed by share price outperformance and evidence indicates that the market may be outperformed by an average of 20% immediately after the buyback. However, if this subsequently proves not to be so, share prices will adjust downwards. Share repurchases in themselves do not create value for the company, but the market may see the information or signals that they provide as significant new information that will affect the share price.

European share repurchases tripled in 1997 to GBP 29bn. Compared to GBP 9bn. In 1996, as companies distributed surplus cash to shareholders. Among the biggest were those by Diageo, British Telecom and Reuters of the UK, Elf Aquitaine of France and Tele-Danmark.

## **E. SHARE SPLITS**

These are the issue of additional shares at no cost to existing shareholders in proportion to their current holdings, but with lower par value. Share splits have no effect on corporate cash flows and, in theory, should not affect the value of the company. The share price, in theory, should reduce proportionately to the number of new shares that are issued.

Motives for share splits include:

- (i) A company wishes to keep its share price within a given trading range, e.g. below, say, RWF1,000 per share. It is sometimes argued that investors might be deterred by a high share price and that lower share prices would ensure a broader spread of share ownership.
- (ii) Companies hope that the market will regard a share split as good news, and that the share price will increase (relative to the expected price) as a result of the announcement. Evidence suggests that even if such reaction occurs it is short-lived unless the company improves cash flows, increases dividends etc. in subsequent periods.

## **Study Unit 13**

### **Leasing**

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##### **C. Advantages of Leasing**

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##### **E. Hire Purchase**

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##### **F. Lease v Buy Decision**

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## A. INTRODUCTION

A lease is a contract between a **lessor** (bank/finance house) and a **lessee** (person/company to whom the asset is leased) for the hire of a specific asset. The lessor retains ownership but gives the lessee the right to use the asset for an agreed period in return for the payment of specified rentals.

## B. OPERATING AND FINANCE LEASES

### Operating Lease

The lessee hires the asset for a period which is normally substantially **less** than its useful economic life. The lessor retains most of the risks and rewards of ownership. Generally, there will be more than one lessee over the life of the asset. An operating lease is “Off Balance Sheet” finance.

### Finance Lease

This transfers substantially all the risks and rewards of ownership, **other than legal title**, to the lessee. It usually involves payment to the lessor over the lease term of the full cost of the asset plus a commercial return on the finance provided by the lessor.

Both the leased asset and the corresponding stream of rental liabilities must be shown on the lessee’s Balance Sheet. Other features include:

- The lessee is responsible for the upkeep, maintenance etc. of the asset.
- The lease has a **primary period**, covering the whole or most of the economic life of the asset. The asset will be almost worn out at the end of the primary period, so the lessor will ensure that the cost of the asset and a commercial return on the investment will be recouped within the primary period.
- At the end of the primary period the lessee has the option to continue to lease at a very small rent (“peppercorn rent”). Alternatively, he can sell the asset and retain about 95% of the proceeds.

## C. ADVANTAGES OF LEASING

1. The lessee’s **capital is not tied up** in fixed assets, so a cash flow advantage accrues.
2. **Liquidity** is improved as no down-payment is required.
3. The lessor can obtain **capital allowances** and pass the benefit to the lessee in the form of lower lease rentals. This is especially important for a company with insufficient taxable profits.
4. The whole of the rental payment is **tax deductible**.
5. **Security** is usually the asset concerned. Other assets are free for other forms of borrowing.
6. Traditional forms of borrowing often impose **restrictive covenants**.
7. The **cost** of other forms of borrowing may exceed the cost of leasing.

## D. SALE AND LEASEBACK

This is an arrangement whereby a firm sells an asset, usually land or a building, to a financial institution and simultaneously enters an agreement to lease the property back from the purchaser. The seller receives funds immediately and retains use of the asset but is committed to a series of rental payments over an agreed period. Thus, it is suited to capital-rationed companies who are eager to finance expansion programmes before the opportunity is lost.

The main disadvantages are the loss of participation in any capital appreciation and the loss of a valuable asset which could have been used as security for future borrowing.

## E. HIRE PURCHASE (HP)

The user pays a periodic hire charge to a finance house which purchases the asset. The charge includes both interest and capital. Generally, the hirer must pay a deposit up-front. Ownership of the asset passes to the user at the end of the contract period, unless he defaults on repayments when the finance house will repossess the asset. The user **can claim capital allowances** on the cost of the asset and the interest element of the periodic charge is tax deductible.

## F. LEASE v BUY DECISION

The Traditional Method breaks the decision into two stages – Acquisition & Financing Decisions:

1. **Acquisition Decision** - Is the asset worth acquiring? Operational cash flows are discounted by the cost of capital normally applied to project evaluations – **after-tax cost of capital**. If a positive NPV results, then proceed to Financing Decision
2. **Financing Decision** – Cash flows of the financing decision (lease v buy) are discounted by the **after-tax cost of borrowing**.

### Example

PP wishes to replace a piece of equipment, costing RWF120,000. This will produce operating savings of RWF50,000 per annum and will have a life of five years. PP's after-tax cost of capital is 15% and operating cash flows are taxed at 30%, one year in arrears.

PP can borrow funds at 13% to purchase the machine or alternatively, it could acquire it by means of a finance lease costing RWF28,000 per annum for five years, the lease rentals payable in advance. The machine is expected to have zero scrap value at the end of the five years.

The machine qualifies for capital allowances on a reducing balance basis at the rate of 25% per annum. However, due to its tax position PP is unable to utilise any capital allowances on the purchase until year one.

Should PP replace the equipment and if so, should it buy or lease it?

### Capital Allowances

1	RWF120,000 x 25%	30,000
2	RWF30,000 x 75%	22,500
3	RWF22,500 x 75%	16,875
4	RWF16,875 x 75%	12,656
		<hr/>
		82,031
	Balancing Allowance: RWF120,000 - RWF82,031	37,969
		<hr/>
		120,000

### Taxation

	Savings	Cap. Allowance	Taxable	Tax @ 30%
1	50,000	30,000	20,000	6,000
2	50,000	22,500	27,500	8,250
3	50,000	16,875	33,125	9,937
4	50,000	12,656	37,344	11,203
5	50,000	37,969	12,031	3,609

### 1. Acquisition Decision

	Equipment	Savings	Taxation	Net	D.F. 15%	Pres. Val.
0	(120,000)			(120,000)	1.000	(120,000)
1		50,000		50,000	0.870	43,500
2		50,000	(6,000)	44,000	0.756	33,264
3		50,000	(8,250)	41,750	0.658	27,471
4		50,000	(9,937)	40,063	0.572	22,916
5		50,000	(11,203)	38,797	0.497	19,282
6			(3,609)	(3,609)	0.432	(1,559)
						<hr/>
						24,874

As the NPV is positive PP should acquire the machine.

Now examine the Financing Decision (Lease v Buy).

### 2. Financing Decision

The cash flows associated with the two options (Lease and Buy) are discounted by a rate appropriate to a financing decision => the **after-tax cost of borrowing**. We concentrate on the financing cash flows – ignore any cash flows which are common e.g. sales revenue.

#### **After-Tax Cost of Borrowing:**

$$13\% \times (1 - t)$$

$$13\% \times 0.7$$

$$= 9.1\% \text{ (say, 9\%)}$$

**Buy:**

	<b>Item</b>	<b>Cash Flow</b>	<b>D.F. 9%</b>	<b>Pres. Val.</b>
0	Purchase	(120,000)	1.000	(120,000)
2	Allowance 30,000 x 30%	9,000	0.842	7,578
3	Allowance 22,500 x 30%	6,750	0.772	5,211
4	Allowance 16,875 x 30%	5,063	0.708	3,585
5	Allowance 12,656 x 30%	3,797	0.650	2,468
6	Allowance 37,969 x 30%	11,390	0.596	6,788
	<b>Present Value of Cost</b>			<b><u>(94,370)</u></b>

**Lease:**

	<b>Lease Rental</b>	<b>Tax Saving</b>	<b>D.F. 9%</b>	<b>Pres. Val.</b>
0-4	(28,000)		4.239	(118,692)
1-5		8,400	3.890	32,676
	<b>Present Value of Cost</b>			<b><u>(86,016)</u></b>

**Note:** The discount factor for years 0-4 can be found by adding 1.0 (for the first instalment of rental paid **up-front**) to 3.239 from the 9% Annuity Tables – year 3 (for the remaining three rentals paid at the **beginning** of years 1, 2 and 3).

\* **Conclusion:** It is cheaper to **lease** the machine rather than purchase.

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## **Study Unit 14**

### **Company Valuations**

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##### **A. Introduction**

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##### **B. Valuation Bases**

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##### **C. Defence Tactics**

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##### **D. Due Diligence**

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## A. INTRODUCTION

- It may be necessary to carry out a valuation for:
  - **Quoted Companies** - where a bid is made and the offer price is an estimated “fair value” in excess of the current market price of the shares.
  - **Unquoted Companies** - where the company is going public; a scheme of merger is being considered; shares are being sold; taxation purposes; to establish collateral for a loan etc.
- The valuation of companies is **not** an exact science.
- It is, generally, necessary to use a number of bases to arrive at a range of values.
- In the end it is a matter of negotiation:
  - How badly do you need the company?
  - How badly do the existing owners wish to dispose?
- Depending on the circumstances different valuations may be applied to the company. For example, where the bidder wishes to establish a presence in a new market it may be prepared to pay a premium, which will be reflected in the valuation. Likewise, where a company in the same industry makes a bid any synergistic benefits could reflect in the valuation it places on the target.

## B. VALUATION BASES

Broadly, the various methods of valuation may be based on:

1. Earnings
2. Assets
3. Dividends
4. Cash Flow
5. Combination of Other Methods

### 1. Earnings

\***P/E Ratio** - the P/E Ratio is the relationship of a company’s share price to its EPS.

$$P/E = \frac{\text{Price}}{\text{EPS}}$$

Therefore:  $P/E \times \text{EPS} = \text{Price}$

If the prospective EPS can be estimated and a suitable P/E Ratio selected it should be possible to arrive at a price (value) for the company. Where an unquoted company is being valued a “best fit” P/E can be obtained from similar quoted companies (same industry, similar size, gearing etc.). When an appropriate P/E has been selected this should then be reduced by 20% - 30% to recognise that shares in unquoted companies are more risky and less marketable than those of quoted companies.

**\*Accounting Rate of Return (ARR)** - the estimated maintainable earnings of the target can be capitalised using the ARR.

$$\frac{\text{Estimated Maintainable Earnings}}{\text{ARR}} = \text{Value}$$

**Example:**

If maintainable earnings are estimated at RWF1.5m. and the ARR is 10% the value is:

$$\frac{\text{RWF1.5m}}{.10} = \text{RWF15m}$$

RWF15m is the absolute maximum which could be paid in order to achieve the 10% rate of return. When estimating the maintainable earnings it may be necessary to adjust them to bring them into line with the bidder's policies.

**\*Super Profits** - if super profits are expected these are reflected in the valuation. A normal rate of return for the industry is applied to the net tangible assets in order to establish normal profits. These are then compared with the expected annual profits and if the expected profits are higher the difference is regarded as a super profit. The valuation is the net assets plus a number of years (say, 3) of super profits. This method has become less fashionable than previously.

**2. Assets**

The valuation is based on the Net Tangible Assets which are attributable to the equity. Any intangible assets and the interests of other capital providers are deducted.

Net Assets per Balance Sheet		X
Less Intangibles (e.g. Goodwill)		<u>(X)</u>
		X
Less Other Parties:		
Preference Shares	X	
Loan Capital	<u>X</u>	
		<u>(X)</u>
Net Tangible Assets – Equity (Valuation)		<u><u>X</u></u>

The figure attached to an individual asset may vary considerably depending on whether it is valued on a going-concern or a break-up (asset stripping ?) basis.

While an earnings basis might be more relevant the Net Assets basis is useful as a measure of the “security” in a share value.

**3. Dividends**

The Dividend Valuation Model may be used to value the company's stream of expected future dividends. It is suitable for the valuation of small shareholdings in unquoted companies.

(i) **Constant Dividends**

$$\text{Value} = \frac{d}{r}$$

Where:  $d$  = dividend per share

$r$  = company's cost of equity

(ii) **Growth In Dividends**

$$\text{Value} = \frac{d_0 (1 + g)}{r - g}$$

Where:  $d_0$  = most recent dividend

$g$  = expected growth rate in dividends

$r$  = company's cost of equity

#### 4. **Cash Flow**

The valuation is based upon the expected net present value of future cash flows, discounted at the required rate of return. However, accurate estimates of the cash flows will rarely be available in an acquisition situation.

#### 5. **Combination of Other Methods**

\***Berliner Method** - this takes the average of the prices calculated using the earnings method and the Net Assets method.

### C. **DEFENCE TACTICS**

Where an unwelcome or hostile bid is received from another company there are a number of steps that can be taken to thwart it:

- Reject the bid on the basis that the **terms are not good enough**.
- Issue a forecast of **attractive future profits and dividends** to persuade shareholders to hold onto their shares.
- **Revalue** any undervalued assets.
- Mount an effective **advertising and P.R. campaign**.
- Find a "**White Knight**" that is more acceptable - in 1986 Distillers Co. (U.K.) received an unwelcome bid from Argyll and found a white knight in Guinness. In Ireland in 1988 Irish Distillers Group found Pernod in their battle with G.C. & C. Brands (Grand Metropolitan).
- Make a **counter bid** – generally only possible if the companies are of a similar size.
- Arrange a **Management Buyout**.
- Attack the **credibility of the offer or the offeror** itself, particularly if shares are offered - e.g. commercial logic of the takeover, dispute any claimed synergies, criticize the track record, ethics, future prospects etc. of the offeror.

- Appeal to the **loyalty** of the shareholders.
- Encourage **employees** to express opposition to the merger
- Persuade **institutions** to buy shares.

## D. DUE DILLIGENCE

The main objective of Due Diligence is to confirm the reliability of the information which has been provided and has been used in making an investment decision. Changes in these primary assumptions may have a significant impact on the price to be paid and possibly even raise questions on the wisdom of proceeding with the transaction. This is a very useful process and at minimum will provide additional information on the potential target.

The following should be considered:

1. **Earnings** – audited financial statements are prepared to comply with statutory/tax requirements. To assess the true quality of earnings an in-depth review of the business and detailed management accounts must be performed. Adjustments may need to be made for one-off events, lost customers, discontinued products, changes in cost structure etc. Also, evaluate non-financial information e.g. quality of risk management, quality of management, corporate governance etc.
2. **Forecasts** – may be prepared on a high-level basis with oversimplified assumptions. The assumptions may be difficult to reconcile with historical performance.
3. **Assets** – write-offs for aged debtors, obsolete stock, idle assets, capitalised costs etc. may need to be made. Also, clarify which assets are to be included in the transfer and agree valuations.
4. **Undisclosed Liabilities** – substantial hidden tax liabilities, penalties and exposures may subsequently arise. Evaluate and possibly, seek protection by obtaining warranties or indemnities against future potential tax issues.
5. **Trading Performance** – related party transactions are often conducted under special pricing terms (e.g. business support services not charged by parent company). The impact on the business of a change in ownership should be assessed to reflect normal commercial arrangements.
6. **Controls** – additional investment in new reporting systems may be required to obtain the quality of information needed to properly monitor performance. Also, ensure the necessary staff are locked-in for an appropriate period.
7. **Balanced View** – issues should be weighed against the upside potential in a balanced way. Examples of the upside might include synergies, optimal financing structure, access to new markets, new management team etc.
8. **Tax Structure** – effective tax planning is a key component in delivering value as quickly as possible.

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## **Study Unit 15**

### **Cost of Capital**

#### **Contents**

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##### **A. Introduction**

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##### **B. Calculation of Cost of Capital**

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##### **C. Weighted Average Cost of Capital (WACC)**

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## A. INTRODUCTION

It is important that a company is aware of its cost of capital. In certain cases it is not initially apparent what this cost is (e.g. new share issue, retained earnings etc.) and a number of models have been developed to assist in calculating the cost of individual sources of finance. Having calculated the cost of each individual source of finance it is then important to calculate an overall cost for the company, based on the mix of funds which it chooses to use.

## B. CALCULATION OF COST OF CAPITAL

### 1. Equity

#### (i) Constant Dividends

$$r = \frac{d}{MV}$$

Where:  $r$  = cost of capital  
 $d$  = annual dividend  
 $MV$  = market value (ex. div)

#### **Example:**

Dividend of RWF150 per share recently paid and expected to continue at this level for the foreseeable future. Current market value of share is RWF800 ex. div.

$$r = \frac{150}{800} = 18.75\%$$

#### (ii) Growth in Dividends

$$r = \frac{D_0(1+g)}{MV} + g$$

Where:  $r$  = cost of capital  
 $D_0$  = most recent dividend  
 $MV$  = market value (ex. div)  
 $g$  = annual rate of growth in dividends

#### **Example:**

Dividend of RWF20 per share about to be paid. Dividends expected to grow by 10% per annum in the future. Current market value of share is RWF160.

$$r = \frac{RWF20(1.10)}{RWF140} + 0.10 = 25.71\%$$

**Note:** Ex. div. price (RWF160 - RWF20) must be used in calculation.



## 2. Preference Shares

$$r = \frac{d}{MV}$$

Where: r = cost of capital  
d = annual dividend  
MV = market value (ex. div)

### Example:

7% Preference Shares RWF1000; Current market value 700 ex. Div

$$r = \frac{70}{700} = 10\%$$

## 3. Irredeemable Debentures

$$r = \frac{k}{MV} (1 - t)$$

Where: r = cost of capital  
k = coupon rate  
t = rate of corporation tax  
MV = market value (ex. interest)

### Example:

7% Irredeemable Debentures; Current market value RWF70 ex. Interest. Corporation Tax 40%.

$$r = \frac{RWF7}{RWF70} (1 - 0.40) = 6\%$$

## 4. Redeemable Debentures

To find cost of capital calculate the **Internal Rate of Return**.

### Example:

**10%** Redeemable Debentures

Redeemable **at par** in **5** years

Corporation Tax = **40%**

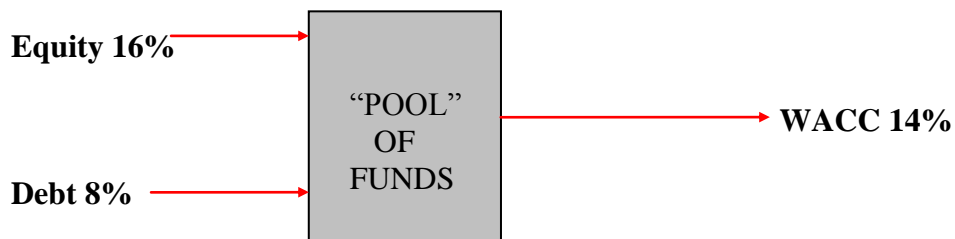
Current Market Value RWF**90** ex. interest

Year	Cash Flows	PV – 10%	PV – 8%
0	(90)	(90)	(90)
1-5	6	22.75	23.96
5	100	62.10	68.10
		<u>(5.15)</u>	<u>2.06</u>

$$\text{IRR} = 8\% + \frac{2.06}{2.06 + 5.15} \times (10\% - 8\%) = \mathbf{8.57\%}$$

### C. WEIGHTED AVERAGE COST OF CAPITAL (WACC)

	Market Val.	Weighting	Cost	WACC
Equity	RWF15m	75%	16%	12%
Debt	RWF5m	25%	8%	2%
	<u>RWF20m</u>	<u>100%</u>		<u>14%</u>



#### Assumptions:

- Weightings do **not** change.
- Business risk does **not** change.

## **Study Unit 16**

### **Portfolio Theory**

#### **Contents**

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##### **A. Introduction**

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##### **B. Portfolio Risk and Return**

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## A. INTRODUCTION

A portfolio is a collection of different investments which comprise an investor's total investments. For example, a property investor's portfolio may consist of many investment properties in different locations and which are used for varied purposes. Other examples of a portfolio are an investor's holding of shares, or a company's investment in many different capital projects. Portfolio Theory is concerned with setting guidelines for selecting suitable shares, investments, projects etc. for a portfolio.

## B. PORTFOLIO RISK AND RETURN

By investing all of one's funds in a single venture the whole investment may be lost if the venture fails. However, by spreading the investment over a number of ventures the risk of losing everything will be reduced. If one of the ventures fails only a proportion of the investment will be lost and hopefully, the remainder will provide a satisfactory return.

### Example

An investor has RWF100,000 to invest. He is considering two companies A and B but is unsure as to which company to select. He expects that either company will produce a return of 12%, which is acceptable. As he is a little worried about the risk of the investments he eventually decides to invest RWF50,000 in each company.

What actually transpires is that company A produces a return of 22% but company B produces a disappointing return of only 2%. By diversifying – i.e. by holding shares in both companies - the investor achieves an overall return of 12% ( $1/2 \times 22\% + 1/2 \times 2\%$ ). If he had invested all of the RWF100,000 in company B a return of only 2% would have been achieved. Thus, the risk of achieving a less than satisfactory return has been reduced by investing in both companies. The exceptional return of company A has offset the poor return of company B.

Investors are generally risk-averse and will seek to minimise risk where possible. The objectives of portfolio diversification are to achieve a satisfactory rate of return at minimum risk for that return.

A portfolio is preferable to holding individual securities because it reduces risk whilst still offering a satisfactory rate of return – i.e. it avoids the dangers of “putting all your eggs in one basket”

When investments are combined, the levels of risk of the individual investments are not important. It is the risk of the portfolio which should be considered by the investor. This requires some measure of joint risk and one such measure is the coefficient of correlation. The relationship between investments can be classified as one of three main types:

1. **Positive Correlation** – when there is positive correlation between investments if one performs well (or badly) it is likely that the other will perform similarly. For example, if you buy shares in one company making souvenirs and another which owns tourist hotels you would expect poor tourist numbers to mean that both companies suffer. Likewise, good tourist numbers should bring additional sales for both companies.
2. **Negative Correlation** – if one investment performs well, the other will do badly and vice versa. Thus, if you hold shares in one company growing coffee and another which makes soft drinks such as lemonade, the change in fashion for a type of drink will affect the companies differently.
3. **No Correlation** – the performance of one investment will be independent of how another performs. If you hold shares in a mining company and a leisure company it is likely that there would be no obvious relationship between the profits and returns from each.

The Coefficient of Correlation can only take values between  $-1$  and  $+1$ . A figure close to  $+1$  indicates high positive correlation and a figure close to  $-1$  indicates high negative correlation. A figure of  $0$  indicates no correlation.

It is argued that if investments show high negative correlation then by combining them in a portfolio overall risk would be reduced. Risk will also be reduced by combining in a portfolio securities which have no significant correlation at all. If perfect negative correlation occurs portfolio risk can be completely eliminated but this is unlikely in practice.

Usually returns on securities are positively correlated, but not necessarily perfectly positively correlated. In this case investors can reduce portfolio risk by diversification.

You may be asked to calculate the expected return of individual investments and also their risk (Standard Deviation). You may also be expected to calculate an expected return if the individual investments are then combined in a portfolio.

**Example:**

Your client is planning to invest in a portfolio of investments. Details are as follows:

Investment 1

Investment of RWF300,000 in Cape Verde property. Expected annual returns are as follows:

Annual Investment Return	Probability of Occurrence
-20%	0.5
40%	0.5

## Investment 2

Investment of RWF700,000 in a London Alternative Investment Market (AIM) equity index fund for a minimum five year period. The fund provides a guarantee against capital erosion, and its expected annual returns are as follows:

Annual Investment Return	Probability of Occurrence
8%	0.9
12%	0.1

The co-efficient of correlation between the two investments is calculated at - 0.2.

## **Liquidity**

The liquidity of an investment refers to the ease with which the investment can be converted into cash. As an investor is never fully sure as to future occurrences it is always important to consider the ease of liquidating an investment. Generally, the more liquid an investment the lower the return that can be expected.

## **London AIM investment**

Has a minimum investment period of 5 years. Thus is not liquid as the investment is 'tied-in' for five years. This should be considered carefully prior to making that proposed investment.

## **Cape Verde Property**

On the face of it the property could be sold and liquidated at short notice. However, you should look carefully at whether or not in reality such property can be sold quickly without the need to reduce prices drastically.

## **Risk**

Investment risk refers to the likelihood that:

- The investment will suffer a reduction in capital value
- That the returns expected from the investment will not materialise/will be lower than expected

Investment risk can be systematic: the risk of the market as a whole and/or unsystematic i.e. risk specific to a specific investment/industry.

Unsystematic risk can be reduced through portfolio diversification whilst systematic risk must be accepted by the investor.

### AIM investment

The risk is lower than the Cape Verde investment as the return expected is 8.4% with an associated risk of 1.2% calculated as follows:

Investment in AIM Fund						
% Return		Probability	Expectation	Deviation	Deviation Squared	S Deviation = Square Root
x	p	x*p	x – EV	(x-EV) <sup>2</sup>	P((x-EV)Sq)	
8	0.9	7.2	-0.4	0.16	0.144	
12	0.1	<u>1.2</u>	3.6	12.96	<u>1.296</u>	
Expected Value (EV)		8.4			1.44	1.2

The fund is less risky as it presents no probability of capital erosion.

### Cape Verde Property

Whilst the potential return of 40% looks attractive there is also the risk of investment losses of 20%. The annual return expected from your investment in Cape Verde property is 10% and the risk attaching thereto measured by standard deviation is 30%. They are calculated as follows:

Investment in Cape Verde Property						
x	% Return	Probability	Expectation	Deviation	Deviation Squared	S Deviation = Square Root
x	p	x*p	x – EV	(x-EV) <sup>2</sup>	P((x-EV)Sq)	
-20	0.5	-10	-30	900	450	
40	0.5	<u>20</u>	30	900	<u>450</u>	
Expected Value (EV)		10			900	30

This investment is significantly riskier than the AIM fund.

### Overall Portfolio Return

The overall expected return from your proposed portfolio is 8.88%. This is a weighted average of the expected return of both investments in the proposed portfolio, using the proportion of each investment as the respective weights. It is calculated as follows:

#### Expected Portfolio Return

<b>Investment Share</b>	<b>Expected % Return</b>	<b>Weighted Investment</b>	<b>Expected Portfolio Return</b>
Cape Verde	10	30%	3%
AIM Fund	8.4	70%	5.88%
<b>Expected Return (EV)</b>			<b>8.88%</b>



## **Study Unit 17**

### **Capital Asset Pricing Model**

#### **Contents**

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##### **A. Introduction**

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##### **B. Systematic and Unsystematic Risk**

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## A. INTRODUCTION

The Capital Asset Pricing Model (CAPM) is an extension of Portfolio Theory, which is concerned with the risk and return of portfolios and the process by which risk can be reduced by efficient diversification. The CAPM assumes that all investors are efficiently diversified and examines the risk and return of any capital asset. A capital asset can be a portfolio, an individual share or security, a portfolio of projects or investments made by a company or even an individual project.

The CAPM gives the required rate of return on a capital asset, based on its contribution to total portfolio risk, called systematic risk. It gives a very neat way of calculating risk-adjusted discount rates.

## B. SYSTEMATIC AND UNSYSTEMATIC RISK

When securities are combined in a portfolio part of each security's total risk (its standard deviation) is eliminated. This is the basis of diversification. That part of an individual security's total risk which can be eliminated by combining that security with an efficient portfolio is called unsystematic (or specific) risk. The balance of an individual security's total risk (that part which cannot be eliminated by diversification) is called systematic (or market) risk.

- **Unsystematic Risk** – risk which can be eliminated by diversification. It is the variation in a company's returns due to specific factors affecting that company and not the market as a whole, e.g. strikes, the breakdown of machinery, changes in fashion for that company's products etc. This specific risk is a random fluctuation uncorrelated with the returns on the market portfolio (the market as a whole). Therefore, when a large number of shares are held these random fluctuations tend to cancel out – i.e. there is risk reduction.
- **Systematic Risk** – risk which cannot be eliminated by diversification. This is the fluctuation in returns due to general factors in the market affecting all companies e.g. inflation, government policy, economic conditions etc. It is that part of the fluctuations in returns which is correlated with those of the market portfolio.

When a capital asset (S) is combined with no other assets, the risk of the portfolio is simply the standard deviation of (S). When further assets are added, however, the contribution of (S) to the portfolio risk is quickly reduced – diversification is eliminating the unsystematic risk. It takes a surprisingly low number of shares in a portfolio to eliminate the majority of unsystematic risk (twenty shares in a portfolio will eliminate approximately 94% of unsystematic risk). All unsystematic risk could only be eliminated when the market portfolio is held.

Only systematic risk is relevant in calculating the required return on capital assets. This is because, on the assumption that investors hold efficient portfolios, unsystematic risk is automatically eliminated when another asset is incorporated within that portfolio. The only effect an asset has on portfolio risk is through its systematic risk.

Some investments may be regarded as risk-free – such as investment in government bonds. . Investors in risky investments should expect to earn a higher return than investors in risk-free investments, to compensate for the risks they are taking. Thus, if investors in Bonds can obtain a return of, say, 6%, an investor in a risky asset should expect a yield in excess of 6%. The Capital Asset Pricing Model uses this approach of rewarding investors in risky assets with a premium on top of the yield on risk-free assets. The CAPM is:

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

Where:

- $R_s$  = The expected return on a capital asset(s)
- $R_f$  = The risk-free rate of return
- $\beta$  = A measure of the systematic risk of the capital asset (the Beta factor)
- $R_m$  = The expected return from the market as a whole

This is a very important formula. Note that the expected return ( $R_s$ ) is equal to the risk-free rate of return ( $R_f$ ) plus an excess return or premium ( $R_m - R_f$ ) multiplied by the asset's Beta factor. You may see different symbols in many textbooks but the same principles apply.

The Beta factor is a measure of the systematic risk of the capital asset. Thus, if shares in ABC Ltd tend to vary twice as much as returns from the market as a whole, so that if market returns increase by, say, 3%, returns on ABC Ltd shares would be expected to increase by 6%. Likewise, if market returns fall by 3%, returns on ABC Ltd shares would be expected to fall by 6%. The Beta factor of ABC Ltd shares would, therefore, be 2.0.

### Example

The returns from the market as a whole have been 15% for some time, which compares with a risk-free rate of return of 7%. Alpha Ltd's shares have a Beta factor of 1.25. What would be the expected returns for Alpha's shares if:

Market returns increased to 16%

Market returns slumped to 9%

$$\begin{aligned} 1. \quad R_s &= R_f + \beta (R_m - R_f) \\ &= 7\% + 1.25(16\% - 7\%) \\ &= 7\% + 11.25\% \\ &= 18.25\% \end{aligned}$$

$$\begin{aligned} 2. \quad R_s &= R_f + \beta (R_m - R_f) \\ &= 7\% + 1.25(9\% - 7\%) \\ &= 7\% + 2.5\% \\ &= 9.5\% \end{aligned}$$

The CAPM provides a useful technique for calculating costs of capital and discount rates appropriate to capital projects based on their individual levels of risk. However, there are two drawbacks to the practical application of the CAPM. Firstly, the data necessary to calculate Beta factors and the difficulty in obtaining them. Secondly, the assumptions on which the

model is based, which question the validity of the model itself. Among these assumptions are:

1. Investors are rational and risk-averse – without this the whole idea of diversification becomes meaningless.
2. There are no transaction costs – this is not true in practice (broker's fees, etc.) It effectively makes the attainment of the market portfolio impossible. However, by holding only a limited number of well selected shares it should be possible to obtain a fairly close approximation to the market portfolio.
3. All investors are efficiently diversified – the CAPM is based on the assumption that all investors have eliminated unsystematic risk by diversification and hence only systematic risk (measured by Beta) is relevant in determining returns.

In conclusion, although the CAPM can be criticised it is nevertheless a very useful model in dealing with the problem of risk.

## **Study Unit 18**

### **Management Control**

#### **Contents**

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##### **A. Costing Systems**

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##### **B. Variances**

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##### **C. Pricing**

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##### **D. Budgeting**

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## A. COSTING SYSTEMS

### Overheads

If a company manufactures a product, the cost will include the cost of the raw materials and components used in it and the cost of the labour effort required to make it. These are direct costs. The company would, however, incur many other costs in making the product which are not directly attributable to a single product but which are incurred generally in the process of manufacturing a large number of units. These are indirect costs or overheads and include:

- Factory rent and rates
- Machine depreciation
- Supervision costs
- Lighting etc.

### Absorption costing

A method of product costing which aims to include in the total cost of a product an appropriate share of an organisation's total overhead – generally an amount which reflects the amount of time and effort that has gone into producing the product.

Over-absorption: Overheads charged to the cost of sales are greater than the overheads actually incurred.

Under-absorption: Insufficient overheads have been included in the cost of sales.

### Marginal costing

An alternative to Absorption Costing. Only variable costs (marginal costs) are charged as a cost of sales. Fixed costs are treated as period costs and are charged in full against the profit of the period in which they are incurred.

Closing stocks are valued at marginal (variable) production cost, whereas in absorption costing stocks are valued at full production cost, which includes absorbed fixed production overhead.

If opening and closing stock levels differ the profit reported for the accounting period under the two methods of cost accumulation will be different. However, in the long-run total profit will be the same, whichever method is used, because total costs will be the same by either method of accounting. Different accounting conventions merely affect the profit of individual periods.

If stock levels increase between the beginning and end of a period, absorption costing will report the higher profit because some of the fixed production overhead incurred during the period will be carried forward in closing stock (reducing cost of sales), to be set against sales revenue in the following period instead of being written off in full against profit in the period concerned.

If stock levels decrease absorption costing will report the lower profit because in addition to the fixed overhead incurred, fixed production overhead which had been carried forward in opening stock is released and is also included in cost of sales.

### **Marginal Costing v Absorption Costing**

With Marginal Costing contribution varies in direct proportion to the volume of units sold. Profits will increase as sales volume rises, by the amount of extra contribution earned. Since fixed cost expenditure does not alter, Marginal Costing gives an accurate picture of how a firm's cash flows and profits are affected by changes in sales volumes.

In contrast, with Absorption Costing there is no clear relationship between profit and sales volume and as sales volume rises the total profit will rise by the sum of the gross profit per unit plus the amount of overhead absorbed per unit. Arguably, this is a confusing and unsatisfactory method of monitoring profitability.

If sales volumes are the same from period to period, marginal costing reports the same profit each period. In contrast, with Absorption Costing profits can vary with the volume of production, even when the volume of sales is constant. Under Absorption Costing there is therefore, the possibility of manipulating profit, simply by changing output and stock levels.

Absorption Costing – the effect of higher production volumes is to reduce unit costs (lower fixed cost per unit) and if sales prices are based on the “cost plus” method, the relevance of output capacity to cost/price/sales demand should be clear. Marginal Costing fails to recognise the importance of working to full capacity.

Selling prices based on Marginal Costing might enable the firm to make a contribution on each unit of product it sells but the total contribution earned might be insufficient to cover all fixed costs.

In the long run, all costs are variable and inventory values based on Absorption Costing will give recognition to these long-run variable costs.

### **Opportunity Costing**

An opportunity cost is the benefit foregone by choosing one opportunity instead of the next best alternative.

With Opportunity Costing the costs of resources consumed are valued at their opportunity cost rather than at the amount it actually costs to acquire them. If no alternative use for a resource exists then the opportunity cost is zero.

The main argument in favour of Opportunity Costing is that management is made aware of how well it is using resources to make products and whether resources could be better used in other ways.

The main drawback is that it is not always easy to recognise alternative uses for certain resources, or to put an accurate value on opportunity cost. It is only likely to be accurate if resources have an alternative use which can be valued at an external market price, such as factory rental, or staff time in the case of professional firms of accountants etc.

Opportunity Costing is often used to determine an absolute minimum below which the price should not be set.

### **Activity Based Costing (ABC)**

Activity Based Costing involves the identification of the factors which cause the costs of an organisation's major activities. Support overheads are charged to products on the basis of their usage of the factor causing the overheads.

A **Cost Driver** is the factor which causes the costs of an activity. Examples are:

<b>Activity</b>	<b>Cost Driver</b>
Ordering	Number of Orders
Production Scheduling	Number of Production Runs
Despatching	Number of Despatches

### **Calculating product costs using ABC**

- |        |  |
|--------|--|
| Step 1 | Identify an organisation's major activities  |
| Step 2 | Identify the factors which determine the size of the costs of an activity/cause the costs of an activity. These are Cost Drivers |
| Step 3 | Collect the cost of each activity into Cost Pools  |
| Step 4 | Charge support overheads to products on the basis of their usage of the activity.  |

### **ABC v Absorption Costing**

#### Allocation & Apportionment of Overheads

The re-apportionment of service department costs is avoided because ABC establishes separate cost pools for support activities, such as despatching and the costs of these activities are assigned directly to products through cost driver rates.

#### Absorption of Overheads

The principal difference is the way in which overheads are absorbed into products. Absorption Costing usually uses two absorption bases (labour hours and machine hours) to charge overheads to products. ABC uses many cost drivers as absorption bases (number of orders, number of despatches etc.)

#### Cost Drivers & Absorption Rates

The principal idea of ABC is to focus attention on what causes costs to increase – the Cost Drivers.



### **Advantages of ABC**

1. It focuses attention on the nature of cost behaviour and attempts to provide meaningful product costs.
2. The complexity of manufacturing has increased with wider product ranges, shorter product life cycles, a greater importance being attached to quality and more complex production processes. ABC recognises this complexity with its multiple cost drivers.
3. It facilitates an understanding of what drives overhead costs.
4. ABC is concerned with all overhead costs.
5. It focuses attention on non-value added activities.

### **Standard Costing**

Standard Costing is a method of cost accounting which incorporates standard values and their differences from actual values – variances

The standard cost is the expected cost of a single cost unit expressed in money values for a defined future period of time. There are a large number of bases which may be used to set standards:

1. **Basic Standard:** Long-term standard which remains unchanged over the years and is used to show trends.
2. **Ideal Standard:** Standard which can be attained under perfect operating conditions – no wastage, no inefficiencies, no idle-time, no breakdown etc.
3. **Attainable Standard:** Standard which can be attained if production is carried out efficiently, machines are properly operated, materials are properly used etc. Some allowance is made for wastage and inefficiencies.
4. **Current Standard:** Standard based on current working conditions (current wastage/inefficiencies).

### **Life Cycle Costing**

Life Cycle Costing tracks revenues and costs for each product over the entire product life cycle.

**Introduction => Growth => Maturity => Decline**

Traditional systems accumulate revenues and costs on a periodic basis (12 months)

### **Target Costing**

A Target Cost is set by subtracting a desired profit margin from a competitive market price.

The following steps may be taken:

1. Researching the market to determine what price customers will be willing to pay for a particular specification and what sales volumes are likely to be achieved.

2. Deducting an acceptable level of margin from the target price to result in the target cost at which the product/service must be made/delivered.
3. Meeting the target cost challenge - accountants, engineers and designers etc. set about the challenge to make/supply the product/service to the desired specification within the target cost.

If successful, target costing should ensure that the necessary specification can be made at a cost which will enable a price to be set which will deliver the margin and sales volume required to satisfy the financial objectives set for that particular product.

## B. VARIANCES

### Calculation of Standard Variances

Variance Analysis is the process by which the total difference between standard and actual results is analysed. The variance may be **Favourable** or **Adverse**. The main variances are:

#### Sales Variances:

1. Sales **Volume** Variance
 

Should Have Sold	units
Did Sell	units
	-----
Variance	units x standard contribution (profit)
  
2. Sales **Price** Variance
 

Actual Qty Sold - Should Have Sold For	RWFx
Actual Qty Sold - Did Sell For	RWFx
	-----
Variance	RWFx
	====

#### Materials Variances:

1. Material **Price** Variance
 

Actual Qty Used - Should Have Cost	RWFx
Actual Qty Used - Did Cost	RWFx
	-----
Variance	RWFx
	====
  
2. Material **Usage** Variance
 

Actual Prod. Should Have Used	kgs
Actual Prod. Did Use	kgs
	-----
Variance	kgs x Standard Cost

## Labour Variances

1. Labour <b>Rate</b> Variance		
Actual Hrs. Worked - Should Have Cost	RWFx	
Actual Hrs. Worked - Did Cost	RWFx	
	-----	
Variance	RWFx	
	====	
2. Labour <b>Efficiency</b> Variance		
Actual Prod. - Should Take	hours	
Actual Prod. - Did Take	hours	
	-----	
Variance		hours x Standard Rate

## Variable Overhead Variances

1. Variable Overhead <b>Expenditure</b> Variance		
Actual Hrs. Worked - Should Have Cost	RWFx	
Actual Hrs. Worked - Did Cost	RWFx	
	-----	
Variance	RWFx	
	====	
2. Variable Overhead <b>Efficiency</b> Variance		
Actual Prod. - Should Take	hours	
Actual Prod. - Did Take	hours	
	-----	
Variance		hours x Standard Rate

## Fixed Overhead Variances

1. Fixed Overhead <b>Expenditure</b> Variance		
Actual Expenditure	RWFx	
Budgeted Expenditure	RWFx	
	-----	
Variance	RWFx	
	====	
2. Fixed Overhead <b>Volume</b> Variance		
Budgeted Expenditure	RWFx	
Actual Prod x Fixed Overhead Absorption Rate (FOAR)	RWFx	
	-----	
Variance	RWFx	
	====	

**Note:** In a Marginal Costing system there is only one fixed overhead variance – the expenditure variance.

## Operating Statement

It is usual to summarise the variances by presenting them in the form of an Operating Statement. This reconciles the budgeted contribution (marginal costing approach) to the actual contribution. An example of an Operating Statement is:

### Operating Statement Month Ended January 2010

Details	Variances	
	Favourable	Adverse
<b>Total</b>		
<b>Budgeted Contribution</b>	<b>100,000</b>	
<b>Variances</b>		
Sales Price		-24,000
Sales Volume	20,000	
Direct Materials Price		-22,000
Direct Materials Usage	10,000	
Direct Labour Rate	13,000	
Direct Labour Efficiency		-8,000
Variable Overhead Expenditure	0	0
Variable Overhead Efficiency		-2,000
Sub Totals	<u>43,000</u>	<u>-56,000</u>
Net Variance		<u>-13,000</u>
<b>Actual Contribution</b>	<b>87,000</b>	

## Variance Analysis

The Variances calculated can be analysed to interpret their impact on the organisation:

1. Material Price Variance – measures the effect on profit of paying a **different price** for materials from that expected.
2. Material Usage Variance – measures the effect on profit of using a **different quantity** of materials from expected for the actual production.
3. Labour Rate Variance – measures the effect on profit of the **actual labour rate per hour differing** from that expected.
4. Labour Efficiency Variance – measures the effect on profit of using a **different number of hours** from expected for the actual production.
5. Variable Overhead Expenditure Variance – measures the effect on profit of the **actual hourly rate differing** from that expected.
6. Variable Overhead Efficiency Variance – measures the effect on profit of the **actual hours incurred of variable overhead differing from those expected for the actual production.**

7. Fixed Overhead Expenditure Variance – measures the effect on profit of the **actual fixed overhead cost being different from that budgeted.**
8. Fixed Overhead Volume Variance – measures the effect on profit of **under or over absorbing** fixed overhead costs because of a **difference between the actual and budgeted production volume.**
9. Sales Volume Variance – measures the effect on profit of the **sales volume differing from that budgeted.**
10. Sales Price Variance – measures the effect on profit of the **actual selling price differing from that budgeted.**

### Reasons for Variances

<u>Variance</u>	<u>Favourable</u>	<u>Adverse</u>
<b>Material Price</b>	Unforeseen discount received Greater care in purchasing Change in material standard	Price increase Careless purchasing Change in material standard
<b>Material Usage</b>	Higher quality mat. than standard More effective use of material Errors allocating mat. to job	Defective material Excessive waste Errors allocating mat. to job Theft
<b>Labour Rate</b>	Use of workers @ lower rate than standard	Wage rate increase
<b>Labour Efficiency</b>	Output produced quicker than expected – motivation, better quality equipment/materials	Lost time in excess of that allowed
<b>Idle Time (usually Adverse)</b>		Machine breakdown Non-availability of materials Illness/injury to workers
<b>O/head Expenditure</b>	Savings in costs incurred More economical use of services	Increase in cost of services Excessive use of services Change in type of services used
<b>O/head Volume</b>	Savings in costs incurred Excessive use of services	Increase in cost of services More economical use of services
<b>Selling Price</b>	Unplanned price increase	Unplanned price reduction
<b>Sales Volume</b>	Additional demand	Unexpected fall in demand Production difficulties

## Investigating Variances

When investigating reasons for variances the following should be considered:

1. **Materiality** – standard costs are averages and small variations will occur. Obtaining reasons for variations may be time consuming and further investigation is not worthwhile.
2. **Controllability** – if a general increase occurs in the price of a raw material there is nothing that can be done internally to control this. Uncontrollable variances require a change in the plan, not an investigation into the past.
3. **Type of Standard Used** – if an Ideal Standard is used variances will always be adverse. A similar problem arises if average price levels are used as standards. If inflation exists, favourable price variances are likely to be reported at the beginning of the period and be offset by adverse price variances later in the period.
4. **Variance Trend** – although small variations in a single period are unlikely to be significant, small variations that occur consistently may need more attention.
5. **Interdependence** – one variance might be inter-related with another and much of the variance might have occurred only because the other variance occurred too. When two variances are interdependent one will usually be adverse and the other favourable.
6. **Cost** – the costs of an investigation should be weighed against the benefits of correcting the cause of the variance.

## Inter-Related Variances

Variances	Explanation
<b>Materials Price &amp; Usage</b>	<ul style="list-style-type: none"><li>* If cheaper materials are purchased in order to obtain a <b>favourable price</b> variance, materials wastage might be higher and an <b>adverse usage</b> variance may occur.</li><li>* If the cheaper materials are more difficult to handle there might be an <b>adverse labour</b> efficiency variance too.</li><li>* If more expensive materials are purchased the <b>price variance will be adverse</b> but the <b>usage variance might be favourable</b> if the materials are easier to use or of higher quality.</li></ul>
<b>Labour Rate &amp; Efficiency</b>	<ul style="list-style-type: none"><li>* If employees are paid higher rates for experience and skill, using a highly skilled team might lead to an <b>adverse rate</b> variance and a <b>favourable efficiency</b> variance.</li><li>* A <b>favourable rate</b> variance might indicate a larger than expected proportion of inexperienced workers which could result in an <b>adverse labour efficiency</b> variance and perhaps, poor materials handling and high rates of rejects too and hence, an <b>adverse materials usage</b> variance.</li></ul>
<b>Sales Price &amp; Volume</b>	<ul style="list-style-type: none"><li>* A reduction in selling price might stimulate bigger sales demand, so that an <b>adverse sales price</b> variance might be counterbalanced by a <b>favourable sales volume</b> variance.</li></ul>

\* A price rise would give a **favourable sales price** variance but possibly cause an **adverse sales volume** variance.

## C. PRICING

### MARGIN and MARK-UP

It should be appreciated that both margin and mark up refer to the same absolute profit. It is simply the context in which the profit is expressed that differs.

<b>Example 1</b>	<b>RWF</b>
Cost of Materials for one printing job	1000
Mark up of 100% (Profit element)	<u>1000</u>
Selling Price of print job	2000

<b>Example 2</b>	<b>RWF</b>
Selling Price of printing job	2000
Margin of 50% (Profit Element)	<u>-1000</u>
Cost of Materials for print job	1000

In example 1 the profit element of RWF1000 is expressed as mark-up on cost which is 100%. That same profit (RWF1000) is expressed as a 50% margin on selling price in example 2.

### LIMITING FACTOR

A limiting Factor is a scarce resource which limits the activity of an organization.

#### Example:

A company makes two products. Unit variable costs are as follows:

	<b>A</b>	<b>B</b>
Direct Materials	2	6
Direct Labour (RWF6 per hour)	12	6
Variable Overhead	2	2
	---	---
	RWF16	RWF14
	==	==

Selling price is RWF28 and RWF22 respectively. For the next month direct labour hours is limited to 16,000 hours. Sales demand is expected to be 6,000 and 10,000 units.

Assuming monthly fixed costs are RWF40,000 and there are no opening stocks determine the optimum production mix.

Total labour hours required is 22,000 (6,000 x 2 hrs) + (10,000 x 1 hr) and only 16,000 hours are available so labour is the limiting factor.

	<b>A</b>	<b>B</b>
Selling Price	28	22
Variable Cost	16	14
	---	---
Contribution Per Unit	12	8
	==	==

**Contribution Per Labour Hour**      RWF6      RWF8

**Ranking**      **2**      **1**

Meet full production demand for Product B and use the remaining labour hours to produce Product A

	<b>Units</b>	<b>Lab Hrs</b>	<b>Contribution</b>	<b>Total Contribution</b>
B	10,000	10,000	RWF8	RWF 80,000
A	3,000 (Limited)	6,000	RWF12	RWF 36,000
				-----
				116,000
	Fixed Costs			40,000
				-----
	Profit			76,000
				=====

### **BREAK-EVEN POINT**

There is a certain level of sales at which there is neither a profit nor a loss - total income exactly equals total costs. Management would be very interested in this level, when setting sales targets.

The Break-Even Point can be found by taking total fixed costs and dividing them by the contribution per unit.

#### **Example:**

An item is sold for RWF10. Variable costs (materials and labour) amount to RWF6 per unit. If total fixed costs are RWF10,000 (e.g. rent) the breakeven point can be found:

$$\frac{10,000}{\text{RWF10} - \text{RWF6}} = 2,500 \text{ units}$$

If the Break-Even Point is required in terms of **Sales Revenue** this can be found from:

$$2,500 \text{ units} \times \text{RWF10} = \underline{\underline{\text{RWF25,000}}}$$

### **MARGIN OF SAFETY**

This is the excess of **Actual Sales** over the Break-Even Point.



Using the above example if actual sales achieved are 3,000 units, then the margin of safety is:

$$3,000 \text{ units} - 2,500 \text{ units} = 500 \text{ units}$$

If expressed in **Sales Revenue**:

$$500 \text{ units} \times \text{RWF}10 = \underline{\text{RWF}5,000}$$

Occasionally, the margin of safety is expressed in percentage terms:

$$\frac{500 \text{ units}}{3,000 \text{ units}} = 17\%$$

### **MAKE v BUY**

Many organisations consider which products/services to produce in-house and which to outsource. In the short term the decision should be made using relevant cost principles.

If spare capacity exists the fixed costs of those resources should be ignored as they will be incurred whether the product is made or purchased. Thus, purchase would be recommended if the buying price is less than the variable costs of manufacture.

If no spare capacity exists, manufacture could cause opportunity costs of lost contribution from existing products or extra costs of buying-in those products (if cheaper).

Before making a final decision management needs to consider many qualitative factors on outsourcing e.g. quality, delivery capability, price guarantees/stability, security, confidentiality, contract duration, ability to produce quantities required etc.

### **Example:**

A client company, AMT Limited (AMT) is involved in the automotive industry and has asked for your assistance to decide whether it should make or buy one of its key components, a gear box. A supplier that is relatively new to the automotive industry has proposed to supply AMT with gearboxes at a cost of RWF600 each. AMT uses 1,000 such gearboxes per annum.

You have obtained the following information relating to AMT's internal production of the gear box.

<b>AMT LIMITED</b>	<b>RWF</b>
Cost of Producing One Gear Box	
Direct Materials – Steel	120
Direct Materials – Miscellaneous	130
Direct Labour - Engineer - 2 hours @ RWF45 per hour	90
Direct Labour - Tool Maker - 8 hours @ RWF20 per hour	160
Variable Overheads	40
Fixed Overheads Absorbed	<u>100</u>
Total Estimated Cost	<b>640</b>

**Notes:**

- The tool making staff are specialists employed part-time solely to produce gearboxes.
- The engineering staff are full-time employees.
- All materials are purchased on a Just-in-Time (JIT) basis.
- Engineering staff are in short supply. AMT estimates that every additional engineering hour made available to the company could deliver a contribution of RWF100 per hour. This relates to contracts that will be declined if the gearbox is to be produced in-house.
- The fixed overhead represents an allocation of AMT's fixed overhead. Included in the total fixed overhead is RWF20,000 for the annual lease of a gear box milling machine. If AMT ceases to produce gearboxes this machine would be returned to the lessor at no penalty cost.

Based on annual production of 1,000 gearboxes the relevant costs and revenues associated with the decision are as follows:

**AMT Limited**  
**Financial Evaluation of Outsourcing Decision**

**Per Gearbox**

<b>Costs Saved</b>	<b>RWF</b>
Steel	120
Miscellaneous	130
Direct Labour - Engineering	90
Direct Labour - Tool Makers	160
Variable Overheads	40
Fixed Overheads (RWF20000/1000)	20
Contribution Generated:	
Engineering (2 hours @ RWF100)	<u>200</u>
Relevant Cost of Internal Manufacture	760
Proposed External Price	<u>600</u>
Difference per Gearbox	160
<b>Total Savings (1000 gearboxes)</b>	<b>160,000</b>

The proposal indicates an annual cost saving of RWF160,000.

**Qualitative Factors**

- The quality of the gearbox from the proposed supplier?
- The reliability of supply from the proposed supplier?
- Will the laying off of the toolmakers damage morale throughout AMT
- Will the new work accepted due to the availability of engineering hours offer more significant contracts hereafter

## D. BUDGETING

### INTRODUCTION

For many organisations in both the private and public sectors the annual budget is the basis of much internal management information. It is the plan for the forthcoming period, expressed in money terms.

The **budget period** is the time period to which the budget relates. It is usually for the accounting/financial year and may be broken down into control periods e.g. months or quarters.

The **budget manual** is a collection of instructions governing the responsibilities of persons and procedures, forms and records relating to the preparation and use of budgetary data.

The **budget committee** is the co-ordinating body in the preparation and administration of budgets. Their responsibilities may include:

- Coordination and allocation of responsibility for the preparation of budgets.
- Issuing the budget manual.
- Communication of final budgets to budget holders.
- Monitoring the budgeting process – comparing actual results with budget.

### PURPOSES OF BUDGETING

#### **Planning**

Major short-term planning device to ensure that managers have thought in advance how they will utilise resources to achieve company policy in their area.

#### **Authorisation**

In some cases, expenditure which has passed through the budget review procedure automatically becomes approved for commitment - the identification of an expense for a particular budget centre is the formal approval that the head of the centre may go ahead and incur such an expense.

#### **Control**

Regular reporting system on the extent to which plans are/are not being met. Management by exception can be established so that deviations from plans are identified and actioned.

#### **Co-ordination**

Budgets ensure that no department is out of line with the others and they afford control of anyone who is inclined to pursue his/her own desires rather than corporate objectives.

### **Communication**

Define/clarify the lines of horizontal/vertical communication. Managers should have a clearer idea of their responsibilities and are likely to work better with others to achieve them.

### **Performance Evaluation**

Useful tools for evaluating how the manager/department is performing. If sales targets are met or satisfactory service provided within reasonable spending limits then bonus or promotion prospects are enhanced.

### **Motivation**

If a manager has been involved in the budget, understands its implications and agrees it is fair he is more likely to be motivated to strive towards those expectations.

## **BEHAVIOURAL FACTORS**

If budgetary control is to be successful, attention must be paid to behavioural aspects, i.e. the effect of the system on people in the organisation and vice versa.

### **Budget Difficulty**

If the performance standard is set too high or too low then sub-optimal performance could result. The degree of budget difficulty is not easy to establish. It is influenced by the nature of the task, the organisational culture and personality factors. Some people respond positively to a difficult target others, if challenged, tend to withdraw.

### **Budgets and Performance Evaluation**

The emphasis on achievement of budget targets can be increased, but also the potential for dysfunctional behaviour, if the budget is subsequently used to evaluate performance. This evaluation is frequently associated with specific rewards such as remuneration increases or improved promotion prospects. In such cases it is likely that individuals will concentrate on those items which are measured and rewarded neglecting aspects on which no measurement exists. This may result in some aspects of the job receiving inadequate attention because they are not covered by goals or targets due to the complexity of the situation or difficulty of measurement.

### **Managerial Style**

The use of budgets in evaluation and control is also influenced by the way they are used by the superior. Different management styles of budget use have been observed, for example:

**Budget constrained** – considerable emphasis on meeting budget targets

**Profit conscious** – a balanced view is taken between budget targets, long-term goals and general effectiveness.

**Non-accounting** – accounting data is seen as relatively unimportant in the evaluation of subordinates.

The style is suggested to influence, in some cases, the superior/subordinate relationship, the degree of stress and tension involved and the likelihood of budget attainment. The style adopted and its implications are affected by the environment in which management is taking place. For example, the degree of interdependency between areas of responsibility, the uncertainty of the environment and the extent to which individuals feel they influence results are all factors to consider in relation to the management style adopted and its outcomes.

### **Participation**

It is often suggested that participation in the budget process and discussion over how results are to be measured has benefits in terms of budget attitude and performance. Views on this point are varied however, and the personality of the individuals participating, the nature of the task (narrowly defined or flexible) and the organisation structure influence the success of participation. But a budget, when carefully and appropriately established, can extract a better performance from the department/manager than one in which these considerations are ignored.

### **Budget Bias (“Slack”)**

Budget managers may be tempted to manipulate the desired performance standard in their favour by making the performance easier to achieve (e.g. understating budgeted sales revenue or overstating budgeted costs) and hence be able to satisfy personal goals rather than organisational goals. This is referred to as incorporating ‘slack’ into the budget.

Budget bias will lead to more favourable results when actual and budgeted costs are compared. Corrective action may not be taken in cases where costs could have been reduced and thus, inefficiency will be perpetuated and overall profitability reduced. Managers may incur unnecessary expenditure in order to protect existing budget bias with the aim of making their jobs easier in future periods. Where budget bias exists, managers will be less motivated to look for ways of reducing costs and inefficiency in those parts of the organisation for which they bear responsibility.

Any organisational planning and control system has multiple objectives but primary amongst these is encouraging staff to take organisationally desirable actions. It is never possible to predict with certainty the outcomes of all behavioural interactions, however it is better to be aware of the various possible implications than to be ignorant of them.

## **TIMETABLE**

**Step 1** Communicate budget policy and guidelines

**Step 2** Determine the factor that restricts output

The principal budget factor (key budget factor/limiting budget factor) is the factor that limits an organisation's performance for a given period and is often the starting point in budget preparation. In most organizations it is the sales demand.

**Step 3** Prepare limiting budget factor – e.g. sales budget

**Step 4** Initial preparation of budgets

Finished Goods Stock Budget

Production Budget

Budgets of Resources for Production

Overhead Cost Budget

Raw Materials Stock Budget

Raw Materials Purchase Budget

Overhead Absorption Rate

**Step 5** Negotiation of Budgets with Superiors

**Step 6** Co-ordination of Budgets

**Step 7** Final Acceptance of Budget

**Step 8** Budget Review

## **PERIODIC v CONTINUOUS (ROLLING) BUDGETING**

A periodic budget is one that is drawn up for a full budget period such as one year. A new budget will not be introduced until the start of the next budget period, although the existing budget may be revised if circumstances deviate markedly from those assumed during the budget preparation period. A continuous or rolling budget is one that is revised at regular intervals by adding a new budget period to the full budget as each budget period expires. A budget for one year, for example, could have a new quarter added to it as each quarter expires. In this way, the budget will continue to look one year forward. Cash budgets are often prepared on a continuous basis. The advantages of periodic budgeting are that it involves less time, money and effort than continuous budgeting. For example, frequent revisions of standards could be avoided and the budget-setting process would require managerial attention only on an annual basis.

A major advantage of continuous budgeting is that the budget remains both relevant and up to date. As it takes account of significant changes in economic activity and other key elements of the organisation's environment, it will be a realistic budget and hence is likely to be more motivating to responsible staff. Another major advantage is that there will always be a budget available that shows the expected financial performance for several future budget periods. It has been suggested that if a periodic budget is updated whenever significant change is expected, a continuous budget would not be necessary. Continuous budgeting could be used where regular change is expected, or where forward planning and control are essential, such as in a cash budget.

## **FIXED v FLEXIBLE BUDGETS**

A **Fixed Budget** is designed to remain unchanged regardless of the volume of sales actually achieved. The budget is prepared on the basis of an estimated volume of production and sales but no plans are made for the event that actual volumes of production and sales may differ. The main purpose of a fixed budget is at the planning stage when it seeks to define the broad objectives of the organisation.

A **Flexible Budget**, by recognising different cost behaviour patterns, is designed to change as volumes of output change.

One approach is where a company, for example, expects to sell 100,000 units, a master (fixed) budget would be prepared on this basis. However, the company might prepare contingency flexible budgets at volumes of, say, 80,000 and 120,000 units sold and then assess the possible outcomes.

A second approach is where the budget is flexed retrospectively, so that at the end of each period the results that should have been achieved given the actual circumstances can be compared with the actual results.

Flexible budgeting uses the principles of marginal costing. In estimating future costs it is often necessary to begin by looking at cost behaviour in the past. For costs which are wholly fixed or variable no problem arises. Costs which in the past have behaved as mixed are more difficult and a technique such as the “High-Low” method must be used for estimating their level.

## **ZERO-BASED BUDGETING (ZBB)**

**Zero based budgeting** involves preparing a budget for each cost centre from a zero base. Every item of expenditure has then to be justified in its entirety in order to be included in the next year's budget.

Traditional budgeting, sometimes called incremental budgeting, takes a current level of spending as a starting point, discussion then takes place on any extra expenditure or what of the current expenditure to cut.

In reality ZBB will start as from the same starting point as Traditional Budgeting; i.e. actual results or, sometimes, the previous, most recent budget.

Zero based budgeting (ZBB) is an approach which takes nothing for granted; it requires justification of all expenditure. This technique would not suit expenditure planning in line departments of a manufacturing company because clear relationships of input and output will exist and be defined by standard values.

In less clearly defined areas such as service departments or non-profit oriented businesses ZBB might have some value if selectively applied. ZBB would involve describing all of the organisation's activities in a series of decision packages, for example, visit frequency, level of eligibility for visit, type of support (medical care, food preparation, wash and clean, shopping needs etc.). The packages can then be evaluated and ranked, what is essential,

highly desirable, desirable and so on. The resources would be allocated according to the packages selected, discussion could also take place between other departments so that a wider allocation of funding is brought into the discussion. Once the budget is set the packages are adopted up to the spending level indicated, this is the cut off point. It is possible that economies and increased efficiency could result if departments were to justify all, not just incremental, expenditure.

It is argued that if expenditure were examined on a cost/benefit basis a more rational allocation of resources would take place. Such an approach would force managers to make plans and prioritise their activities before committing themselves to the budget. It should achieve a more structured involvement of departmental management and should improve the quality of decisions and management information, enabling such questions as: should this be done? At what quality and quantity?, should it be done this way?, what should it cost?.

ZBB may not be simple or easy to install, could be expensive in time and effort to analyse all expenditure and difficult to establish priorities for the activities or decision packages. Managers are often reluctant to commit themselves to ZBB because they believe they already do it. Critics of ZBB have asserted that no real change in funding allocation takes place as a result of the exercise. However, any system which encourages managers to examine, and communicate about their spending and performance levels must be useful providing it does not prevent individuals fulfilling their other duties and responsibilities

## **RESPONSIBILITY ACCOUNTING**

Responsibility accounting is a system of reporting that compares budget performance with actual performance for responsibility centres, often departments of an organisation. It is based on the recognition of individual areas of responsibility as specified in a firm's organisation structure and job descriptions. It seeks to trace the costs, revenue and investment to responsibility centres so that deviations from budget can be attributed to the person(s) in charge.

Potential difficulties in operating a system of responsibility accounting are:

Clear and unambiguous identification of areas of responsibility: For example where events or desired courses of action may be dictated or influenced by more than one person or department - often referred to as dual responsibility.

Identification of controllable costs and revenues from those which are uncontrollable by a particular person or department: This is influenced by the organisational level or hierarchical level of authority the manager occupies and the time span involved. A top manager can, in effect, control all costs by closing a department. Middle management can only influence some departmental costs.

Additionally, a cost which is uncontrollable over a month may be controllable over five years. It may encourage focus on the short-term performance, that is, achievement of the current budget, which may neglect the long-term performance of the organisation as a whole.



## **FEEDBACK & FEED-FORWARD**

Feedback is where actual results (outputs) are compared with those which were planned for the budget period. Likewise, the actual inputs (costs) are compared with the budget, taking account of the actual level of outputs. This comparison of actual with plan takes place **after** the event. The intention is to learn for the future so that future deviations of actuals and plans are avoided or minimised. It is a reactive process.

Feed-forward is where prediction is made of what outputs and inputs are expected for some future budget period. If these predictions are different from what was desired/planned, then control actions are taken which attempt to minimise the differences. The aim is for control to occur **before** the deviation is reported, in this way it is more proactive. Budget generation is a form of feed-forward in that various outcomes are considered before one is selected.

## **TOP-DOWN v BOTTOM-UP APPROACH IN BUDGET SETTING**

Top-Down - budgets are imposed by senior management and are more likely to support the strategic objectives of the company, and the operations of different divisions are more likely to be co-ordinated. It may be an appropriate form of budget setting in small organisations where senior managers are likely to have a detailed knowledge of all aspects of the business or in situations where close control of planned costs is called for, such as business start up or difficult economic conditions. It also has the advantage of decreasing the amount of time taken and the resources consumed by budget preparation.

There are number of difficulties with the top-down approach that make it likely that it will not regularly be used in isolation. Staff may be demotivated if they have not been involved in the formulation of budgets that produce targets they are expected to achieve, especially if their rewards and incentives are linked to their performance against budget. This reduction in motivation could result in strategic objectives and organisational goals being less than fully supported at the operational level, with company performance and profitability suffering as a result. Initiative and innovation could also be lost as staff simply 'work to budget', rather than making creative suggestions for improving performance that they feel are unlikely to be rewarded, or form part of future plans.

Bottom-Up - functional and other junior managers participate in the preparation of budgets. This is likely to lead to more realistic and more co-ordinated budgets than the top-down approach if these managers have a more detailed knowledge of the operations and markets of the organisation. It is also likely to be useful in large, established companies where the complexity of the budget-setting process calls for detailed input from lower levels of the organisation. This approach will also lead to higher levels of motivation and commitment, since managers will have contributed towards the targets against which their performance will be measured.

There are a number of difficulties with the bottom-up approach. For example, it can be more time-consuming than the top-down approach because of the larger number of participants in the budget-setting process. Participants may become dissatisfied if their budget proposals are subsequently amended by senior managers. Managers may introduce an element of budgetary slack into their budget estimates, giving them a 'zone of comfort' in reaching

budget targets. The bottom-up approach also requires detailed planning and co-ordination of the budget-setting process, perhaps supported by a budget manual.

The top-down and bottom-up approaches represent two extremes of the budget-setting process. In practice, a compromise or negotiated approach is likely to be used, with senior management reviewing and amending the budget proposals of operational managers in the light of the organisation's strategic plan, and operational managers negotiating amendments to aspects of the budget they find unacceptable.

## **Study Unit 19**

### **Sundry Definitions**

#### **Contents**

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##### **A. Introduction**

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##### **B. Sundry Definitions**

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## **A. INTRODUCTION**

One of the questions on the Compulsory Section (Section A) of your paper requires you to write briefly on a number of topics. There is a small choice in that you must complete five out of seven topics. There is a limited range of areas that are examined and certain topics tend to repeat over a number of examination sessions.

You do not need to write a thesis on each subject but a couple of well chosen sentences (as below in Section B) will suffice. Where appropriate a numerical example will help you to get your message across and put some order on your solution.

You should regard this question as a “banker” and if you have done your work you should be well capable of attaining almost maximum marks (20 marks in total, 4 per topic).

## **B. SUNDRY DEFINITIONS**

### **Altman’s Z-Scores**

Professor I Altman researched 66 companies that experienced corporate failure to determine whether or not their ultimate failure could have been predicted? His summarised findings are known as Altman’s Z-Score Model. This model suggests that if five key financial ratios are calculated and weighted, and, if the result lies outside stated parameters, then the business faces a heightened risk of future corporate failure. The model is used by investors and analysts to inform them of the financial risk associated with potential investments because of its usefulness in predicting corporate failure.

### **Beta as a Measure of Market Risk**

One of the fundamental principles of financial theory is that individual shares (or more generally individual securities) will relate to the average market risk in a fairly consistent manner. Empirical statistical research of a share’s actual performance (in terms of its returns and the variation in such returns) will indicate whether it is more prone to variation than the market as a whole - i.e. either more or less risky than the market. The risk of a particular share relative to the market as a whole is measured by that share’s unique "beta" value. The beta value reflects differences in systematic risk characteristics and is most frequently used in CAPM calculations. The beta value for the market as a whole is usually set at 1.0, and so any share with a Beta greater than 1.0 is considered to a relatively riskier investment than a portfolio of shares representative of the market as a whole.

### **Capital Asset Pricing Model**

The CAPM is a model which sets out in mathematical form the relationship between the return on any individual security, the risk free rate of return, and the return on the market portfolio. It may be summarised as follows:

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

$\beta$  in the equation above (the ‘Beta’ factor) is a variable which attempts to capture the Systematic Risk associated with the business activity of a company. The model is significant in that it is premised on the view that the return on any given security is associated with the non-diversifiable (systematic) risk associated with the security.

### **Capital Rationing**

Capital rationing refers to a situation where there is a budget ceiling or constraint on the amount of funds available to a firm for investment purposes during a specific period of time. The significance of such a circumstance is that firms facing a capital rationing constraint must attempt to identify and implement the optimal selection of investment opportunities which will maximise the value of the firm while remaining subject to the given constraint. In theory, however a firm should accept all projects that yield a positive NPV when evaluated at an appropriate cost of capital. A selection process which causes firms to select only a limited number of potentially value enhancing projects is by definition sub-optimal. Typically when firms consider themselves to be subject to some capital constraint, it is probably untrue to say that capital is simply not available. Rather the more likely explanation of a capital shortage is that firms believe the cost of capital to be too high, and so they express a reluctance to continue raising further capital. Ultimately though the test of whether the cost of capital is too high should centre on the positive/negative nature of the resultant NPV outcome.

### **Centralised Treasury Management**

Companies of significant size are often diverse in terms of trading activities and/or geographic spread. Many such companies choose to centralise their treasury function. This involves expert staff conducting the treasury management function for all parts of the business, however diverse. This decision will be reached for a combination of the following reasons:

- Ability to afford specialist staff
- Increased purchasing power given the increased value of borrowings/investments
- Foreign currency set-off potential
- Better control over activities
- Improved risk monitoring
- Improved tax planning
- The ability to “offset” negative cash balances in one unit against the positive cash balances in another

### **Convertible Loan Stock**

Convertible loan stock is a debt instrument issued by firms which offers the holder the right to have the debt redeemed in the usual way at the redemption date. Alternatively, the holder of the loan stock may exercise a right to convert the debt into equity at some pre-determined conversion rate. The buyer of convertible loan stock usually accepts a slightly lower rate of interest on the instrument as part of the price to be paid for holding what amounts to a bet on the future movement of the share price - the holder of loan stock in effect enjoys an option on the firm's equity. This lower rate of interest makes loan stock attractive to the issuer, as does the fact that conversion into equity represents an in-built form of liquidation of the instrument and removes the necessity to raise further debt in order to redeem the initial loan stock.

### **Corporate Raider**

Corporate raider is a title given to organisations/individuals who target companies to acquire, and, if successful, will in the post acquisition period carve the business into its component

parts with a view to selling/strip the individual parts at a profit. Ultimately, the corporate raider may retain ownership of a small element (if any) of the acquired enterprise.

Corporate raiders are also known as ‘asset strippers.’

### **Deep Discount Bonds**

A Deep Discount Bond is a bond which is usually issued at a price considerably lower than its par value. The investor in these bonds is, therefore, given the opportunity to buy a bond at a very cheap price. Typically, the trade-off for this benefit is that the bond will carry a lower coupon rate of interest than other comparable debt instruments. The investor, therefore is essentially attracted by a potential capital gain, while the issuer of the loan stock will be attracted by the relatively lower service costs of the loan stock. This latter feature can be particularly attractive to companies which wish to raise capital for a new business venture and where the future cash flows may be uncertain in the early years of the project, thereby putting a strain on servicing a higher cost loan stock.

### **Dividend Policy – Considerations in Determining**

It should always be remembered that ordinary shareholders are not prima facie entitled to receive an annual dividend. The decision whether or not to declare a dividend and if declared, the extent of same, rests with the Board of Directors. Each year the Board will consider the dividend decision. The key considerations when making this decision will include:

- **Profitability** – what are the profits for the period for which the dividend is to be decided?
- **Legality** – in short, only realised gains can be distributed
- **Cash Flow** – has the company the cash reserves from which to pay dividends?
- **Taxation** – is it more tax efficient for equity shareholders to receive dividends or capital growth, or the optimum mix thereof?
- **Signalling Effect** – what will the declaration of any size dividend (including a nil declaration) signal to the investment community?
- **Expectations** – what are shareholders expecting as a dividend and how any change will impact on their investment behaviour?
- **Residual Theory** – can the company use profits to invest in projects which will increase the capital value of shares by more than the dividend that could be paid?

### **Dividend Yield as a Method of Company Valuation**

The dividend yield is the ratio of the most recent dividend to the market price of the security under review. In this sense the dividend yield is a measure of the "rate of return" on equity capital which might serve as a comparable ratio to the percentage yield on loan stock. However, as dividends are paid net of withholding tax, it is usually necessary to calculate the grossed up equivalent of the dividend and use this figure in working out the dividend yield. Such an approach allows yields on equity to be compared more directly to yields on interest bearing loan stock. By convention, a normal yield gap implies that the return on equity should be higher than that on debt. Nevertheless it can occasionally be observed that the dividend yield can be less than yields on debt. In the long run, however, it is true to say that

investors expect their return on equity, in terms of dividend yield and capital gains, to exceed the yield debt.

### **Efficient Market Hypothesis**

The efficiency of a stock market means the ability of the market to price shares quickly and fairly to reflect all the available public information in respect of each share.

The Efficient Market Hypothesis proposes that a particular stock market is an efficient stock market. This is because of the role that well informed institutional investors and their market analysts play.

How efficient the market is at responding to such information is considered to vary between:

- Strong form efficiency
- Semi-strong form efficiency
- Weak form efficiency

There has been much research carried out on the topic of measuring market efficiency, with varying and sometimes contradictory findings.

### **Equivalent Annual Cost**

Equivalent annual costs are employed when considering the optimum cycle within which to replace capital assets, or in other circumstances when assessing the repayments on a loan over a given schedule of years. In effect, EACs are the direct reciprocal of annuity factors. This technique becomes useful when an analyst is examining assets with different life spans and so the question of replacement cycles cannot be easily addressed given that in any particular year one or more of the assets being considered will still have some period of its useful life left to run. The EAC may perhaps best be understood by reference to the concept of annuity factors. For example, whereas annuity factors allow the analyst to reduce a known and constant future cash flow to a present value using an uncertain discount factor, the EAC method facilitates the conversion of a known present value capital cost to an unknown future stream of (notional) cash flows over a defined period of time. This restructuring of the financial data can allow a more direct comparison to be made between assets with different useful lives and thereby allow decisions to be made on optimal replacement cycles.

### **Factoring of Debtors**

The factoring of debtors is a financial service usually provided by a specialist agency, such as a department within a bank. Typically, it involves the administration of a client companies debtors, the collection of its debts, the elimination or at least tighter control of bad debts, and the advancement of certain sums of cash on the basis of invoices issued to date. The provision of factoring services therefore represents - on the part of the Factor - the ability to develop specialist expertise, operating economies of scale, and an access to a level of liquidity which is only likely to be available to a major financial institution such as a bank. Factoring services are not however simply a means of resolving the problems of financially distressed or illiquid companies, but rather are only likely to be available to reputable companies with an established trading record. Most banks will be reluctant to take on the administration of a particularly troublesome debtors' ledger containing many unknown client firms.

### **Flotation Costs**

Flotation costs arise in the context where a company is offering its securities - either debt or equity - for sale in the capital market. These costs can be significant and in most cases the amount of funds the firm receives is less than the aggregate value suggested by the price at which the issue in question has been sold. Typically flotation costs can involve all or any of the following items - underwriting expenses, audit and legal fees, fees to corporate bankers or their financial advisors, public relations fees, costs of printing, advertising and circulating the offer for sale, and stock market fees. Although these costs can be significant, most firms tend to take the prudent view that they cannot afford to avoid them entirely. This is particularly so in relation to underwriting costs and the fees associated with professional advice on the issue price for the particular security in question. This latter aspect is especially important as failure to strike the correct issue price could undermine the success of the entire issue.

### **Internal Rate of Return**

The internal rate of return is the discount rate that equates the present value of cash inflows with the present value of cash outflows (often the initial investment associated with the project). In other words, it is the discount rate that yields an NPV of zero for the project. For the investor, the IRR of a project represents a form of cut off rate for project financing. If the investor concerned can manage to raise funds at a rate lower than the IRR, the NPV of the project will be positive and the investor would proceed with the proposed investment. If on the other hand the cost of funds was greater than the IRR then the investor would recognise that the return on the investment would not be sufficient even to remunerate the capital committed, much less create additional wealth by way of a positive NPV outcome.

### **Management Buyouts (MBOs)**

When an organisation decides to divest itself of part of its business for whatever reason (cash absorber, lack of strategic fit etc.) it may receive offers from many parties. Occasionally, the management of the part of the business being sold may decide to mount a bid for the purchase. This is known as a management buyout. Research has shown that MBOs tend to be more successful than 3rd party acquisitions. This is for many reasons including knowledge of the industry and the specific business being bought as well as increased levels of motivation to make the business a success.

Often with MBOs the most difficult challenge is to raise sufficient finance.

### **Money Markets and Capital Markets**

The capital market is the market where various long term financial instruments (ordinary shares, bonds etc.) are initially raised and subsequently traded. It is the market where business seeks long term financial capital which will support the company and its ongoing operations. The capital market also represents a structured interface between those with surplus funds who are seeking out remunerative opportunities (investors), and those agents with a capital deficit who need to raise additional finance (borrowers). By contrast, the money market is essentially a market for short term investments only. The money market does not necessarily need a physical location in which to operate, and is better understood as a loose network of traders and financial institutions engaged in an ongoing process of electronic trading. Typically the instruments traded mature in a matter of days or months, and usually involve investors with short term surplus cash or those interested in tactical or speculative trading. The instruments traded do not form part of the fundamental financial



structure of a business. Typical instruments traded on the money market are, short dated government stock, certificates of deposit, repurchase agreements, and commercial paper.

### **Operating Gearing**

Operating gearing describes the relationship between the fixed and variable costs of production. Operating gearing can be measured either as the percentage change in earnings before interest and tax for a percentage change in sales, or as the ratio of fixed to variable costs. Companies whose costs are mostly fixed are said to have high operating gearing. These companies are highly vulnerable to the need to generate consistently high revenue earnings in order to cover the high fixed costs. High operating gearing therefore is perceived to increase business risk, and empirical tests have tended to support the view that such companies should have relatively higher Beta factors (*Study Unit 17 above*). In terms of an influence on a company's Beta factor, the analogy between financial and operating gearing is quite strong.

### **Operating Lease**

An operating lease is distinguished from a finance lease in that the lease period is usually less than the useful life of the asset. The lessor therefore relies upon either subsequent leasing or the eventual sale of the asset to cover the initial outlay involved in acquiring the asset. Under an operating lease, the lessor is usually responsible for repairs and maintenance, and therefore retains the risks and rewards of ownership of the asset. In effect then, an operating lease involves the short term rental of an asset.

### **Overtrading**

The term "overtrading" refers to a situation where a company is unable to finance the level of operations which it has achieved. Usually this can arise where a company is under-capitalised at the outset, or where providers of long-term capital remain unwilling to inject further funds as the business grows and expands in volume terms. In such cases, the continued growth of the business will put increasing strains upon working capital, as the company realises it has little option but to have further recourse to short term borrowing and securing finance through the non payment of creditors. Very often, overtrading occurs where a company significantly expands its sales (and accordingly its volume of operations) through the introduction of generous credit terms without enjoying any corresponding credit concessions from its creditors. Such an arrangement will inevitably place a strain on the company's liquidity which is only likely to be finally resolved through some form of financial restructuring involving access to long term capital.

### **Portfolio Theory**

A portfolio is the collection of different investments that make up an investor's total holding. A portfolio might be the investment in stocks and shares of an investor or the investments in capital projects of a company. Portfolio theory is concerned with establishing guidelines for building up a portfolio of stocks and shares, or a portfolio of projects. The same theory applies to both stock market investors and to companies with capital projects to invest in.

There are five major factors to be considered when an investor chooses investments, no matter whether the investor is an institutional investor, a company making an investment or a private individual investor:

- **Security** - Investments should at least maintain their capital value.

- **Liquidity** - Where the investments are made with short-term funds, they should be convertible back into cash at short notice.
- **Return** - The funds are invested to make money. The highest return compatible with safety should be sought.
- **Spreading Risks** - The investors who puts all his funds into one type of security risks everything on the fortunes of that security. If it performs badly his entire investment will make a loss.
- **Growth Prospects** - The most profitable investments are likely to be businesses with good growth prospects.

### **Price Earnings Multiple**

This is a way of determining the worth of a share/a business. It is normally used in the context of an acquisition whereby the target company is valued at a multiple of its profit before tax. It is a widely recognised indicator of value by the investment community. The multiple which will be used in each case is normally industry dependent. For example an IT based industry may have a different P/E multiple than the retail industry, given the differences in the two industries such as; risk profile, life cycle stage etc. In practice, the final agreed multiple paid would be influenced greatly by the negotiation skills of both parties. It should be noted that using the P/E multiple is not the only way in which shares/business can be valued. Other methods include asset-based valuations.

### **Public/Private Funding Partnerships**

This is a new and increasingly popular method of funding public capital projects e.g. schools, infrastructure projects etc. In essence, the capital cost of the project is borne by the private enterprise and the public body will pay for the use of the facility over an extended contractual period. At the end of the period the facility will revert to public ownership. The attraction to the private enterprise is the security, and hopefully, the guaranteed financial return of contracting with government departments. Examples of public/private partnerships include the much delayed and much publicised new Cork School of Music.

### **Reverse Yield Gap**

A Yield Gap refers to a position whereby it is normally expected that the yield on equities will be greater than that available on debt. This is so because equity is considered to be more risky than debt, and so in order to compensate shareholders for accepting this extra risk, a higher level of reward must be offered. In some rare instances though, it can emerge to be the case that the yield on debt is actually greater than the yields on equity - this position is referred to as a reverse yield gap. However such a situation should emerge as a temporary phenomenon only. If the yield position did not correct itself (i.e. showing a higher return on equities once again), then the entire investment market for equities would eventually collapse. It is likely that such a build up of sentiment against equities would serve as the very stimulus necessary to depress share prices and so bring dividend yields into a more normal position.

### **Scrip Dividends**

Scrip dividends are shares given to shareholders instead of - or in addition to - cash. Firms may elect to pay a scrip dividend in circumstances where competing pressures on cash reserves might render it unattractive to make a more conventional cash payment - this could be the case where the firm is experiencing liquidity difficulties or where surplus cash may be

target on a potential capital investment. In such circumstances a firm may pay a scrip dividend in order to be seen to be remunerating shareholders' investment in the firm without placing an unwelcome strain on current cash resources.

### **Semi-Strong Form Efficiency in Capital Markets**

Semi-strong form efficiency is one of three categories described in that aspect of capital market theory concerned with the efficiency with which the market processes relevant information. This is a significant question as it allows analysts to arrive at a view as to how well informed a particular capital market is. In this context, the phrase 'well informed' can be taken to mean that actors on the market have access to all pertinent information, and that they enjoy the capacity to understand and interpret that information with a view to basing subsequent trade decisions on that insight. Semi-strong efficiency refers to a context where investors are in possession of all historical information pertaining to a particular financial instrument, as well as all published information relating to the instrument. This is considered to be the circumstance which best describes most capital markets. To make any stronger claims would move the investor into a position of privileged or insider information, which would in turn move the market towards strong form efficiency.

### **Strong Form Efficiency**

Strong form efficiency refers to a position in the capital markets where the market is considered to be so efficient at filtering relevant information, whether of a public or private nature, that the prices of all financial securities traded on that market are thought to embody all such information. In this sense then, and under conditions of strong form efficiency, "insider trading" could not conceivably happen, since no sooner would an individual have identified a reason to adopt a particular trading position, than market prices would have immediately adjusted to reflect this rationale, and any envisaged gains from trade in such securities would thereby be dissipated.

### **Systematic Risk**

Systematic risk refers to the inherent risk of a particular investment which cannot be diversified away. This systematic risk simply reflects the fact that some business activities are naturally more risky than others and any investor wishing to invest in the financial securities of such a business, must accept the associated level of risk which cannot be detached from the business. Normally, investors will expect to earn a higher reward for taking this additional level of risk. This need to earn a higher reward is captured by the beta term of the capital asset pricing model which serves to quantify the amount of risk premium to be associated with the particular financial security.

### **Traditional View of Gearing and the WACC**

The traditional view of the relationship between gearing and the **Weighted Average Cost of Capital** is that the two variables are directly correlated. Graphically this relationship is shown as a "U" shaped curve, suggesting that as the level gearing rises from an initial level of zero indebtedness, the WACC initially falls, bottoms out to a minimum position, and then begins to rise again as the level of gearing rises with more and more debt being added to the capital mix. The simple reason for this characterisation of events was that because the return on debt was necessarily lower than the return on equity (because of the different risk profiles), then introducing debt into the capital mix must inevitably lead to a fall in the overall cost of capital. This view, of course, presupposes that that at low levels of gearing,

equity holders would not be alarmed by the initial introduction of debt and that accordingly their expected rate of return would not change. However at high levels of gearing, the equity holders begin to perceive a significantly changed risk environment and they therefore seek compensation by way of higher returns. This then leads to a subsequent rise in the WACC.

The particular significance of the traditional view was that because it suggested that the WACC could possess minimum point (i.e. a gearing level where the WACC was at its lowest), then this in turn implied that the value of the firm would alter in line with changes in gearing and that management could, by virtue of some creative financial engineering, manipulate the value of the firm.

### **Venture Capital**

The role of the Venture Capitalist as a source of finance has in many countries increased in profile over the last number of years. A Venture Capitalist, as the name suggests is an organisation which provides finance for new and developing businesses. A Venture Capitalist typically takes the form of a department of an established financial services organisation or as a private asset management expert.

Venture Capitalists carefully vet proposals put to them by businesses that require funding. Only those businesses that are operationally and technologically feasible have market appeal and are financially viable are likely to be backed by the Venture Capitalist.

Once backing is agreed the Venture Capitalist will fund an agreed percentage of the venture. This funding, typically, will be a mixture of equity and debt. Venture Capitalists will require board representation in order to help protect their interest by having influence (voting rights) over policy and strategic decision-making. Venture Capitalists do not expect to retain interests in businesses they back for the long term. A typical “get-out” to liquidate their investment would be in the form of “going public”.

### Present Value Table

Present value of 1 i.e.  $(1 + r)^{-n}$

Where  $r$  = discount rate

$n$  = number of periods until payment

Periods (n)	Discount rates (r)										
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	1
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	2
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	3
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	4
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	5
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	6
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	7
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	8
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	9
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	10
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	11
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	12
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	13
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	14
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	15
(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833	1
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694	2
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579	3
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482	4
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402	5
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335	6
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279	7
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233	8
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194	9
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162	10
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135	11
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112	12
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093	13
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078	14
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065	15

### Annuity Table

Present value of an annuity of 1 i.e.  $\frac{1 - (1 + r)^{-n}}{r}$

Where  $r$  = discount rate  
 $n$  = number of periods until payment

Periods (n)	Discount rates (r)										
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	1
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	2
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	3
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	4
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	5
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	6
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	7
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	8
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	9
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	10
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	11
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	12
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103	13
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367	14
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606	15
(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833	1
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528	2
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106	3
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589	4
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991	5
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326	6
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605	7
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837	8
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031	9
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192	10
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327	11
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439	12
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533	13
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611	14
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675	15